pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Southcentral Regional Office
CLEAN WATER PROGRAM

NPDES PERMIT FACT SHEET
INDIVIDUAL SEWAGE

Application Type	**Renewal**	Application No.	**PA0030643**
Facility Type	**Municipal**	APS ID	**275994**
Major / Minor	**Major**	Authorization ID	**1244400**

Applicant and Facility Information

Applicant Name	**Shippensburg Borough Authority**	Facility Name	**Shippensburg Borough STP**
Applicant Address	111 N Fayette Street	Facility Address	963 Avon Drive
	Shippensburg, PA 17257-1101		Shippensburg, PA 17257-8121
Applicant Contact	John Epley	Facility Contact	Wade Farner
Applicant Phone	(717) 532-5414	Facility Phone	(717) 532-5414
Client ID	121190	Site ID	452150
Ch 94 Load Status	Not Overloaded	Municipality	Shippensburg Borough
Connection Status	No Limitations	County	Cumberland
Date Application Received	August 8, 2018	EPA Waived?	No
Date Application Accepted		If No, Reason	Major Facility, Significant CB Discharge
Purpose of Application	NPDES Permit Renewal.		

Summary of Review

Shippensburg Borough Authority (Shippensburg) has applied to the Pennsylvania Department of Environmental Protection for reissuance of its NPDES permit. The permit was last reissued on January 17, 2014 and became effective on February 1, 2014. The permit was amended on September 29, 2015 to increase the facility's design flows. The permit expired on January 31, 2019.

Based on the review, it is recommended that the permit be drafted.

Sludge use and disposal description and location(s): Sludge is processed via on-site treatment units and then sent out for a land application under PAG073513.

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
X		*Jinsu Kim* Jinsu Kim / Environmental Engineering Specialist	August 1, 2022
X		Maria D. Bebenek for Daniel W. Martin, P.E. / Environmental Engineer Manager	August 15, 2022
X		Maria D. Bebenek Maria D. Bebenek, P.E. / Program Manager	August 15, 2022

Discharge, Receiving Waters and Water Supply Information			
Outfall No.	001	Design Flow (MGD)	4.3 (interim) 4.95 (final)
Latitude	40° 3' 35.00"	Longitude	77° 31' 53.00"
Quad Name	Shippensburg	Quad Code	1825
Wastewater Description:	Treated Sewage		
Receiving Waters	Middle Spring Creek	Stream Code	10602
NHD Com ID	56409839	RMI	5.43
Drainage Area	20.6	Yield (cfs/mi^2)	0.1492
Q_{7-10} Flow (cfs)	3.074	Q_{7-10} Basis	USGS 01570000
Elevation (ft)		Slope (ft/ft)	
Watershed No.	7-B	Chapter 93 Class.	CWF, MF
Existing Use	None.	Existing Use Qualifier	None.
Exceptions to Use	None.	Exceptions to Criteria	None.
Assessment Status	Impaired		
Cause(s) of Impairment	Suspended Solids		
Source(s) of Impairment	Agriculture, Urban Runoff/Storm Sewers		
TMDL Status	Final, 04/09/2001	Name	Conodoguinet Creek Watershed

Background/Ambient Data		Data Source
pH (SU)	8.1	WQN0241 (July – September)
Temperature (°F)	19	WQN0241 (July – September)
Hardness (mg/L)	178	WQN0241
Other:		

Nearest Downstream Public Water Supply Intake	Carlisle Borough		
PWS Waters	Conodoguinet Creek	Flow at Intake (cfs)	48
PWS RMI	35.95	Distance from Outfall (mi)	

Drainage Area
The discharge is to Middle Spring Creek at RM 5.43. A drainage area upstream of the discharge point is estimated to be 20.6 sq.mi., according to USGS StreamStats available at https://streamstats.usgs.gov/ss/.

Streamflow
USGS StreamStats produced a Q7-10 flow of 6.74 cfs at the point of discharge. However, a depth to rock value used in calculating low flow statistics was higher than the maximum required in regression equations. As a result, USGS StreamStats indicated that estimates for low flow statistics were extrapolated with unknown errors. DEP has therefore determined to estimate the Q7-10 flow using a low flow method as follows:

USGS gage 01570000 on Conodoguinet Creek near Hogestown is located about 350' below the PA American Water Co. intake and is affected to some degree by the withdrawal. Recent stream flow retrievals resulted in a Q7-10 of 63.11 cfs at this gage. The average daily PWS withdrawal has been 4.529 MGD or 7.006 cfs. This results in a total flow of 70.116 cfs at the gage after adjustment for the PWS intake. The Q30-10 gage flow is 76.108 + 7.006 = 83.11. Gage information for Q1-10 flow is not available so the previous Q1-10:Q7-10 ratio is retained.

Q7-10 runoff rate = (63.11 + 7.006)/470 = 0.1492 cfs/sq.mi.
Q30-10:Q7-10 = 83.11/70.116 = 1.185:1
Q1-10:Q7-10 = 59.97/67.107 = 0.89.1

Middle Spring Creek
Under 25 Pa Code §93.9o, Middle Spring Creek from T303 (Avon Road) to Mouth has a designated protected water use of cold water fishes and migratory fishes. No special protection water is impacted by this discharge. PFBC lists this stream as a Class A Wild Trout stream from headwaters to T303 (Avon Road). The discharge is located downstream of this classification; therefore, no Class A Wild Trout Fishery is impacted by this discharge.

Public Water Supply Intake
The nearest downstream public water supply intake is Carlisle Borough, located on the Conodoguinet Creek approximately 34 miles from the discharge point. Given the distance, the discharge is not expected to impact the water supply.

Treatment Facility Summary				
Treatment Facility Name: Shippensburg STP				
WQM Permit No.	**Issuance Date**			
2105402	August 1, 2005			
Waste Type	**Degree of Treatment**	**Process Type**	**Disinfection**	**Avg Annual Flow (MGD)**
Sewage	Tertiary	Activated Sludge	UV	4.95
Hydraulic Capacity (MGD)	**Organic Capacity (lbs/day)**	**Load Status**	**Biosolids Treatment**	**Biosolids Use/Disposal**
6.0	8,034	Not Overloaded	Sludge Digester	Land applied

Shippensburg owns and operates a municipal sanitary wastewater treatment plant located at 963 Avon Drive, Shippensburg PA 17257. This facility serves the areas of Shippensburg Borough (59.58%), Southampton Township Cumberland County (19.5%), Southampton Township Franklin County (13%), Orrstown Borough (0.22%), Letterkenny Township (1.2%), and Shippensburg Township (6.5%), totaling a population of 16,150. All sewer systems are 100% separated according to the application.

This facility is considered a major sewage facility with design flow greater than 1.0 MGD but less than 5.0 MGD. On February 5, 2012, DEP issued a Water Quality Management (WQM) permit no. 2105402 11-1, approving an upgrade providing overall increased capacity by increasing influent pump capacity, the addition of two (2) influent screening systems, the upgrade of the 5 stage BNR to include integrated fix film activated sludge (IFAS) system, upgrade of the tertiary filtration, upgrade of the UV disinfection system and miscellaneous sludge handling upgrades. While it was undergoing modifications, the facility has experienced issues associated with the implementation of the IFAS system, specifically associated with multiple IFAS media spills beginning in November 2013 and extending through March 2014. Since 2012, the WQM permit was amended in September 2015, February 2017, November 2017, and December 2018 to modify design flows and other items that are related to the 2012 upgrade project. As of the date of this fact sheet, this upgrade has not yet been fully completed. More details will be discussed later in this fact sheet.

Once the upgrade project is completed, the facility will utilize a complete IFAS activated sludge process including primary/secondary screening,

Ferric chloride is used for coagulant settling agent. Sludge is processed via thickeners (2), aerated holding tanks (2) and belt filter press. Any solids generated from this site is stored in storage pads (3) prior to being land applied under PAG073513.

There are five (5) commercial/industrial users connected to the sewer systems. These users are shown below.

Name	Description	Flow (GPD)	Significant Industrial User?
Volve Construction Equipment	Build/Assemble Road Machinery	Process 7,500; Sanitary 4,000	Yes
Chamberlin & Wingert LLC	Processing of septic system and portable toilet wastes	Process 12,000	Yes
Schreiber Foods, Inc.	Process dairy products for cheese and yogurt	Process 500,000	Yes
Cumberland Valley Rental	Launder Uniforms & Rugs	Process 13,000	Yes
Shippensburg University	University w/multiple food preparation buildings/facilities	Process 100,000; Sanitary 200,000	Yes

According to the application, the permittee is currently implementing an approved pretreatment program administered by EPA.

Shippensburg also utilizes two (2) outfalls receiving stormwater drained from the site.

Compliance History

Summary of DMRs: A summary of past 12-month DMR data is present on the next page.

Summary of Inspections:

10/15/2021: Brandon Bettinger, DEP Water Quality Specialist, conducted a routine inspection. No violation was noted at the time of inspection. Recommended influent/effluent composite samplers be connected to flow meters for flow-proportional composite sampling as required by the permit.

01/07/2021: Michael Benham, former DEP Water Quality Specialist, conducted an administrative inspection of Chesapeake Bay nutrient monitoring. A number of errors were identified. The permittee was recommended to revise and resubmit corrected forms.

01/27/2020: Michael Benham conducted a routine inspection and recommended influent/effluent composite samplers be connected to flow meters for flow-proportional composite sampling as required by the permit. No violations were noted at the time of inspection.

Other Comments:

A Consent Order and Agreement (COA) was prepared on August 17, 2017 and amended on August 7, 2018 and November 26, 2019. This COA is for the IFAS upgrade project. More detailed information associated with this COA is available for a file review.

Since the last permit reissuance, there are five (5) permit violations related to untreated discharge (2/26/2014), unpermitted discharge (3/3/2014, 3/4/2014, 5/14/2018) and failure to monitor pollutants required by the permit (1/24/2017). Also, following effluent violations reported since the last permit reissuance.

Date	PARAMETER	Results	Limits	UNIT OF MEASURE	STATISTICAL BASE CODE
Mar-14	Ammonia-Nitrogen	12.01	7.5	mg/L	Average Monthly
Mar-14	Ammonia-Nitrogen	226	206	lbs/day	Average Monthly
Jul-14	Total Phosphorus	1.11	0.5	mg/L	Average Monthly
Jul-14	Total Phosphorus	18.6	17.9	lbs/day	Average Monthly
Sep-14	Total Phosphorus	0.73	0.5	mg/L	Average Monthly
Dec-14	Total Suspended Solids	57	45	mg/L	Weekly Average
Jul-15	Total Suspended Solids	66	45	mg/L	Weekly Average
Jul-16	Total Phosphorus	0.55	0.5	mg/L	Average Monthly
Oct-16	Ammonia-Nitrogen	14.05	2.2	mg/L	Average Monthly
Oct-16	Total Phosphorus	0.59	0.5	mg/L	Average Monthly
Oct-16	Ammonia-Nitrogen	225	78	lbs/day	Average Monthly
Nov-16	Ammonia-Nitrogen	7.68	6.6	mg/L	Average Monthly
Jan-17	Ammonia-Nitrogen	10.12	6.6	mg/L	Average Monthly
Feb-17	Ammonia-Nitrogen	12.13	6.6	mg/L	Average Monthly
Jun-18	Total Phosphorus	0.69	0.5	mg/L	Average Monthly
Feb-20	Total Phosphorus	0.62	0.5	mg/L	Average Monthly
Dec-20	Ammonia-Nitrogen	9.24	6.3	mg/L	Average Monthly

DEP's database shows that there is no open violation associated with this facility.

Effluent Data

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

Parameter	AUG-21	JUL-21	JUN-21	MAY-21	APR-21	MAR-21	FEB-21	JAN-21	DEC-20	NOV-20	OCT-20	SEP-20
Flow (MGD) Average Monthly	2.0997	2.11	2.13	2.41	2.67	2.796	2.38	2.33	2.33	2.08	2.19	2.22
Flow (MGD) Daily Maximum	2.75	2.4	2.81	3.12	3.37	4.09	3.57	2.78	4.64	2.32	2.95	2.54
pH (S.U.) Minimum	7.2	7.3	7.3	7.1	7.2	7.2	7.2	7.1	6.9	7.1	7.0	6.8
pH (S.U.) Instantaneous Maximum	7.9	7.9	7.8	7.9	7.7	7.8	7.7	8.0	7.9	7.9	7.9	8.1
DO (mg/L) Minimum	7.9	8.0	8.3	8.4	8.6	8.9	9.2	9.2	8.5	8.1	8.3	7.9
CBOD5 (lbs/day) Average Monthly	< 37.9	< 38.9	< 45.5	< 43.3	< 86.1	167.6	147.7	146.6	< 139.1	101.7	86.1	39.2
CBOD5 (lbs/day) Weekly Average	< 59.17	< 58.78	< 62.47	< 52.04	< 119.34	219.26	212.84	225.29	< 407.33	242.78	213.71	42.74
CBOD5 (mg/L) Average Monthly	< 2.1	< 2.2	< 2.5	< 2.1	< 3.9	7.2	11.6	7.8	< 7.4	5.8	< 4.9	< 2.1
CBOD5 (mg/L) Weekly Average	< 2.6	< 3.3	< 3.6	< 2.3	< 5.5	9.6	7.7	12.7	< 22.1	14.2	< 12.5	< 2.3
BOD5 (lbs/day) Raw Sewage Influent Average Monthly	3222.8	4087.7	4323.8	3597.1	3720.9	4322.9	6708.9	3693.3	3978.3	3570.2	3304.7	3181.6
BOD5 (lbs/day) Raw Sewage Influent Daily Maximum	4243	4845.9	6635.3	4924.9	4514.9	5776.6	4260.2	4625.2	5266.5	5131.6	5072.6	4331.4
BOD5 (mg/L) Raw Sewage Influent Average Monthly	181	227	239	171	166	183	216	194	211	203	183	169
TSS (lbs/day) Average Monthly	< 29.43	< 61.82	74.43	68.84	109.92	124.92	112.98	106.50	< 75.81	124.61	8.10	46.09
TSS (lbs/day) Raw Sewage Influent Average Monthly	3758.3	5543.3	6358.7	4995.2	5680.4	4443.9	10955.8	4229.3	4169.1	5305.6	4462.6	4651.5
TSS (lbs/day) Raw Sewage Influent Daily Maximum	6880.5	8306.0	11132.6	6264.2	7071.5	5692.1	5690.6	5114.1	5139.8	6164.9	5779.6	5603.1
TSS (lbs/day) Weekly Average	< 57.338	< 164.80	106.59	101.33	149.078	197.32	164.13	156.13	< 117.64	170.97	136.36	82.733

Parameter	AUG-21	JUL-21	JUN-21	MAY-21	APR-21	MAR-21	FEB-21	JAN-21	DEC-20	NOV-20	OCT-20	SEP-20
TSS (mg/L) Average Monthly	< 1.6	< 3.5	4.2	3.3	4.9	5.2	8.0	5.7	< 4.0	7.1	4.4	< 2.5
TSS (mg/L) Raw Sewage Influent Average Monthly	208	310	351	241	254	189	289	225	222	302	247	249
TSS (mg/L) Weekly Average	< 3.0	< 9.5	6.0	5.0	6.5	8.0	5.5	8.0	< 6.5	10	7.5	< 4.0
Fecal Coliform (CFU/100 ml) Geometric Mean	< 6	5	< 11	< 5	< 2	19	280	121	184	179	74	33
Fecal Coliform (CFU/100 ml) Instantaneous Maximum	< 17	19	115	148	6	130	810	330	480	356	159	61
UV Transmittance (%) Minimum	34.13	42.90	70.40	70.70	70.80	00	00	0.00	37.10	47.80	56.40	63.80
Nitrate-Nitrite (mg/L) Average Monthly	< 5.86	< 4.60	4.21	< 5.86	< 5.90	< 3.84	< 4.46	< 6.65	< 2.79	3.68	< 6.18	< 6.23
Nitrate-Nitrite (lbs) Total Monthly	< 3264.2	< 2560.5	2290.8	< 3863.1	< 3991.7	< 2816.9	< 2451	< 3858.2	< 1709.3	1967.9	< 3497.0	3527.9
Total Nitrogen (mg/L) Average Monthly	< 7.29	< 5.61	< 6.41	< 7.74	< 7.86	6.99	< 9.26	10.87	< 14	8.24	< 8.44	< 8.00
Total Nitrogen (lbs) Effluent Net Total Monthly	< 4058	< 3120.1	< 3481	< 5054.9	< 5311.1	5075.2	< 5130.7	6417.9	< 8227.3	4385.1	< 4749.3	4528.8
Total Nitrogen (lbs) Total Monthly	< 4057.9	< 3120.1	< 3481.0	< 5054.9	< 5311.1	5075.2	< 5130.7	6417.9	< 8227.3	4385.1	< 4749.3	4528.8
Total Nitrogen (lbs) Effluent Net Total Annual												< 56399
Total Nitrogen (lbs) Total Annual												< 56399
Ammonia (lbs/day) Average Monthly	< 8.91	< 8.98	11.88	< 10.63	< 12.63	31.20	31.41	< 50.62	172.61	5.35	< 13.92	9.4
Ammonia (mg/L) Average Monthly	< 0.50	< 0.50	< 0.65	< 0.51	< 0.56	1.34	1.60	< 2.53	9.24	2.85	< 0.78	< 0.5
Ammonia (lbs) Total Monthly	< 276.4	< 278.4	< 356.3	< 329.5	< 378.9	967.1	879.4	< 1569.2	5351.1	1510.6	< 431.4	282
Ammonia (lbs) Total Annual												< 11636
TKN (mg/L) Average Monthly	< 1.44	< 1.01	< 2.21	< 1.88	1.96	3.15	4.80	4.22	11.21	4.56	2.26	< 1.77
TKN (lbs) Total Monthly	< 793.7	< 559.6	< 1190.2	< 1191.8	1319.5	2258.3	2679.7	2559.6	6518.0	2417.2	1252.3	1000.9

Parameter	AUG-21	JUL-21	JUN-21	MAY-21	APR-21	MAR-21	FEB-21	JAN-21	DEC-20	NOV-20	OCT-20	SEP-20
Total Phosphorus (lbs/day) Average Monthly	5.21	7.11	5.6	7.76	4.58	3.99	4.56	3.39	< 2.17	3.79	3.49	3.11
Total Phosphorus (mg/L) Average Monthly	0.29	0.39	0.31	0.36	0.21	0.17	0.23	0.18	< 0.12	0.21	0.19	0.17
Total Phosphorus (lbs) Effluent Net Total Monthly	162	220.5	167.4	240.5	137.5	123.7	127.7	105.1	< 67	113.6	108.1	93.2
Total Phosphorus (lbs) Total Monthly	161.6	220.5	167.4	240.5	137.5	123.7	127.7	105.1	< 67.4	113.6	108.1	93.2
Total Phosphorus (lbs) Effluent Net Total Annual												2815
Total Phosphorus (lbs) Total Annual												2815

Existing Effluent Limits and Monitoring Requirements

The tables below summarize effluent limits and monitoring requirements specified in the latest permit (permit amendment).

Interim

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	Weekly Average	Instant. Maximum		
Flow (MGD)	Report	Report	XXX	XXX	XXX	XXX	Continuous	Measured
pH (S.U.)	XXX	XXX	6.0	XXX	XXX	9.0	1/day	Grab
Dissolved Oxygen	XXX	XXX	5.0	XXX	XXX	XXX	1/day	Grab
CBOD5	896	1,434 Wkly Avg	XXX	25	40	50	2/week	24-Hr Composite
Total Suspended Solids Raw Sewage Influent	Report	Report	XXX	Report	XXX	XXX	2/week	24-Hr Composite
BOD5 Raw Sewage Influent	Report	Report	XXX	Report	XXX	XXX	2/week	24-Hr Composite
Total Suspended Solids	1,075	1,613 Wkly Avg	XXX	30	45	60	2/week	24-Hr Composite
Fecal Coliform (CFU/100 ml) May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	XXX	1,000	2/week	Grab
Fecal Coliform (CFU/100 ml) Oct 1 - Apr 30	XXX	XXX	XXX	2,000 Geo Mean	XXX	10,000	2/week	Grab
UV Transmittance (%)	XXX	XXX	Report	XXX	XXX	XXX	1/day	Metered
Ammonia-Nitrogen May 1 - Oct 31	78	XXX	XXX	2.2	XXX	4.4	2/week	24-Hr Composite
Ammonia-Nitrogen Nov 1 - Apr 30	236	XXX	XXX	6.6	XXX	13.2	2/week	24-Hr Composite
Total Phosphorus	17.9	XXX	XXX	0.5	XXX	1.0	2/week	24-Hr Composite

Final

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	Weekly Average	Instant. Maximum		
Flow (MGD)	Report	Report	XXX	XXX	XXX	XXX	Continuous	Measured
pH (S.U.)	XXX	XXX	6.0	XXX	XXX	9.0	1/day	Grab
Dissolved Oxygen	XXX	XXX	5.0	XXX	XXX	XXX	1/day	Grab
CBOD5	1,032	1,651 Wkly Avg	XXX	25	40	50	2/week	24-Hr Composite
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	1,238	1,857 Wkly Avg	XXX	30	45	60	2/week	24-Hr Composite
Fecal Coliform (CFU/100 ml) May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	XXX	1,000	2/week	Grab
Fecal Coliform (CFU/100 ml) Oct 1 - Apr 30	XXX	XXX	XXX	2,000 Geo Mean	XXX	10,000	2/week	Grab
UV Transmittance (%)	XXX	XXX	Report	XXX	XXX	XXX	1/day	Metered
Ammonia-Nitrogen May 1 - Oct 31	86	XXX	XXX	2.1	XXX	4.2	2/week	24-Hr Composite
Ammonia-Nitrogen Nov 1 - Apr 30	260	XXX	XXX	6.3	XXX	12.6	2/week	24-Hr Composite
Total Phosphorus	20.6	XXX	XXX	0.5	XXX	1.0	2/week	24-Hr Composite

Chesapeake Bay

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	24-Hr Composite
Kjeldahl---N	Report			Report		2/week	24-Hr Composite
Nitrate-Nitrite as N	Report			Report		2/week	24-Hr Composite
Total Nitrogen	Report	Report		Report		1/month	Calculation
Total Phosphorus	Report	Report		Report		2/week	24-Hr Composite
Net Total Nitrogen	Report	60,273				1/month	Calculation
Net Total Phosphorus	Report	8,036				1/month	Calculation

Development of Effluent Limitations and Monitoring Requirements

Outfall No. 001 **Design Flow (MGD)** 4.3 (interim) 4.95 (final)
Latitude 40º 3' 35.00" **Longitude** -77º 31' 53.00"
Wastewater Description: Sewage Effluent

Design Flow
Effluent limits and monitoring requirements developed in the NPDES permit are based on the annual average design flow of the treatment facility. A treatment plant upgrade was originally proposed back in 2012 and the additional modification of the design flows (from 4.3 MGD to 4.95 MGD) proposed in 2015 also became part of this upgrade. As a result, the NPDES permit was amended in 2015 addressed this upgrade and include interim/final permit requirements for pre/post phases of the upgrade along with a quarterly progress report submission requirement. However, the construction for the entire upgrade project has still not yet completed, majorly due to construction delays/technical issues and addition of several minor modifications to the upgrade. Based on this, DEP has decided to reintroduce interim/final permit requirements for the upcoming permit renewal. The interim permit requirements will be developed based on the flow of 4.3 MGD and final permit requirements will be developed based on the flow of 4.95 MGD.

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)

Water Quality-Based Limitations

CBOD5, NH3-N and Dissolved Oxygen
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 technical guidance no. 391-2000-007 describes the technical methods contained in the model for conducting wasteload allocation analyses and for determining recommended 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. A model output indicates that existing interim (4.3 MGD) and final (4.95 MGD) effluent limits are still adequate and protective of water quality. No change is therefore recommended.

Toxics
DEP utilizes a Toxics Management Spreadsheet to facilitate calculations necessary for completing a reasonable potential analysis and determining WQBELs for toxic pollutants. The worksheet combines the functionality of DEP's Toxics Screening Analysis worksheet and PENTOXSD. The worksheet recommended a routine monitoring requirement for certain heavy metals including Total Aluminum, Total Copper Dissolved Iron, Total Iron, and Total Zinc for both interim and final permit conditions. Initially, the worksheet also recommended effluent limits for Bis(2-Ethylhexyl)Phthalate (DEHP). Shippensburg has been using a plastic container to collect samples which is not a preferred collection method for DEHP. DEP has then requested additional samples using a glass container. The results of additional samples were received and showed that

none of samples contained a detectable level of DEHP. DEP has therefore ruled out the need of permit requirements for DEHP.

Best Professional Judgment (BPJ) Limitations

Dissolved Oxygen
A minimum DO limit of 5.0 mg/L is a DO water quality criterion found in 25 Pa. Code § 93.7(a). This limit is included in the existing NPDES permit based BPJ. It is still recommended to include this limit in the draft permit to ensure that the facility continues to achieve compliance with DEP water quality standards. This approach is consistent with DEP's SOP no. BPNPSM-PMT-033.

Total Phosphorus
Historically, an average monthly Total Phosphorus limit of 2.0 mg/L was recommended in NPDES permits, per DEP phosphorus guidance 391-2000-018, to control phosphorus effluent levels for any facilities that are expected to contribute 0.25% or more of the total phosphorus loading of the entire basin. DEP has previously determined that this facility meets the criteria. However, the limit of 0.5 mg/L was imposed in the permit. The fact sheet developed for the last permit renewal indicates that this 0.5 mg/L limit is based on an old Middle Spring Creek implementation plan requiring 95% removal. At this time, DEP does not find any rationale to relax or remove this requirement. Therefore, existing limits will remain unchanged in the permit in accordance with 40 CFR §122.44(l)(1).

Additional Considerations

Compliance Schedule
Given that it is unclear when the construction will be fully completed, developing a compliance schedule with specific dates would not be reasonable. However, a narrative Part C condition will be developed to require Shippensburg to continue to provide a quarterly progress report until the construction is completed.

Flow Monitoring
The requirement to monitor the volume of effluent will remain in the draft permit per 40 CFR § 122.44(i)(1)(ii).

Influent BOD & TSS Monitoring
As a result of negotiation with EPA, the existing influent monitoring reporting requirement for TSS and BOD5 will be maintained in the draft permit. This requirement has been consistently assigned to all municipal wastewater treatment facilities.

E. Coli Monitoring
DEP's SOP no. BPNPSM-PMT-033 recommends a routine monitoring for E. Coli in all new and reissued sewage permits. Given the design flow of this facility, a monthly monitoring requirement will be included in the permit.

Ultraviolet (UV) light Disinfection
DEP's SOP no. BPNPSM-PMT-033 recommends a routine monitoring of UV light output transmittance or intensity when the facility is utilizing an UV disinfection system in lieu of chlorination. This recommendation was implemented so that permittees would demonstrate the effectiveness of UV disinfection. This approach is reasonable as it would ensure that the treatment unit is properly operated and maintained as it is also required under 40 CFR §122.41(e).

Total Dissolved Solids (TDS)
TDS and its associated solids including Bromide, Chloride, and Sulfate have become statewide pollutants of concern. The requirement to monitor these pollutants must be considered under the criteria specified in 25 Pa. Code § 95.10 and the following January 23, 2014 DEP Central Office Directive:

For point source discharges and upon issuance or reissuance of an individual NPDES permit:

-Where the concentration of TDS in the discharge exceeds 1,000 mg/L, or the net TDS load from a discharge exceeds 20,000 lbs/day, and the discharge flow exceeds 0.1 MGD, Part A of the permit should include monitor and report for TDS, sulfate, chloride, and bromide. Discharges of 0.1 MGD or less should monitor and report for TDS, sulfate, chloride, and bromide if the concentration of TDS in the discharge exceeds 5,000 mg/L.

- Where the concentration of bromide in a discharge exceeds 1 mg/L and the discharge flow exceeds 0.1 MGD, Part A of the permit should include monitor and report for bromide. Discharges of 0.1 MGD or less should monitor and report for bromide if the concentration of bromide in the discharge exceeds 10 mg/L.

-Where the concentration of 1,4-dioxane (CAS 123-91-1) in a discharge exceeds 10 µg/L and the discharge flow exceeds 0.1 MGD, Part A of the permit should include monitor and report for 1,4-dioxane. Discharges of 0.1 MGD or less should monitor and report for 1,4-dioxane if the concentration of 1,4-dioxane in the discharge exceeds 100 µg/L.

Shippensburg reported maximum effluent concentrations of 554 mg/L for TDS, 0.25 mg/L for Bromide, and <1.0 ug/L for 1,4-dioxane. Accordingly, the requirement to monitor for these pollutants is not necessary.

Conodoguinet Creek Watershed TMDL
A TMDL was developed in 2001 for 16 named sub-watersheds and 2 unnamed sub-watersheds in the Conodoguinet Creek basin including Middle Spring Creek to mainly address excess nutrient (particularly phosphorus) and sediment loads from non-point sources such as agriculture, construction, and urban/storm sewer runoffs. The TMDL discussed thirty-six (36) existing point source facilities within the basin in which the TMDL also pointed out that eight (8) of these facilities including Shippensburg contribute significant amounts of nitrogen and/or phosphorus to the watershed. It appears the TMDL does not address Total Phosphorus wasteload allocations (WLAs) for those facilities discharging directly into the Conodoguinet Creek nor any other sub-watersheds, except for one WLA for a point source in the Rowe Run watershed. This is likely because some of these watersheds were impaired due to sediment not nutrients; thus, the TMDL was developed to focus on those that are majorly contributing sediment impairment. The discharge from Shippensburg STP was in fact addressed in this TMDL as follows:

The Shippensburg Borough Authority sewerage treatment facility (NPDES PA0030643) is identified as a significant contributor of nutrients to Middle Spring Creek, but it was not included in the TMDL analysis for Middle Spring Creek because Middle Spring Creek was listed only for sediment, not nutrient enrichment. The Shippensburg Borough Authority sewerage facility will be, however, included in the calculations for the total load reduction analysis for the entire Conodoguinet Creek basin.

The TMDL predicted a total TP load reduction of 19,987 lbs/yr. and a total sediment load reduction of 20,552,580 lbs/yr. based on loading rates for phosphorus and sediment computed using the GWLF model. The TMDL also noted that there is no WLA for this TMDL because there are no known point source discharges in the watershed. At this time, no additional requirement will be given to this permit. In case the TMDL is revised to include a sediment WLA for this facility or to include a TP WLA based on any further stream assessment, DEP may reopen this permit to include those WLAs.

Chesapeake Bay TMDL
In August 2019, DEP finalized Phase 3 Chesapeake Bay Watershed Implementation Plan to provide the plans in place by 2025 to further achieve the nutrient and sediment reduction targets that would ultimately meet 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 3 WIP is an update to the Pennsylvania's Chesapeake Bay TMDL Strategy (2004), the Chesapeake WIP Phase I (2011) and Phase 2 WIP (2012). 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, Shippensburg is a Phase 1 significant discharger located within the Chesapeake Bay watershed. The following Cap Loads specified in the current Supplement to the Phase 3 WIP will be included in the draft permit:

NPDES Permit No.	Phase	Facility	Latest Permit Issuance Date	Permit Expiration Date	Cap Load Compliance Start Date	TN Cap Load (lbs/yr)	TN Offsets Included in Cap Load (lbs/yr)	TP Cap Load (lbs/yr)	TN Delivery Ratio	TP Delivery Ratio
PA0030643	1	Shippensburg Borough Authority	09/29/2015	01/31/2019	10/1/2010	60,273	-	8,036	0.951	0.436

These Cap Loads were established based on the original design flow of 3.3 MGD (3.3 MGD * 8.34* 6 mg/L * 365 & 3.3 MGD * 8.34*0.8 mg/L * 365). In addition, Shippensburg is currently authorized to use 11,525 lbs/year as Total Nitrogen Offsets toward compliance with the above-referenced Total Nitrogen Cap Loads that were calculated based on the 25 lbs/year per on-lot sewage disposal systems (in EDUs) and the reported 461 on-lot sewage disposal systems that have been connected to the sewer system after January 1, 2003. These offsets will continue to be allowed and will be specified in the permit. No additional offsets were requested during this permit term.

Stormwater Requirements
Stormwater discharges from any POTWs (SIC Code 4952) described in 40 CFR § 122.26(b)(14)(ix) require coverage under an NPDES permit. Shippensburg currently utilizes two (2) outfalls collecting stormwater drained from the property. DEP's standard Part C stormwater requirements and site-specific best management practices (BMPs) will be included in the permit as this is a standard approach for major sewage facilities over 1.0 MGD.

Mass Loading Limitations
All effluent mass loading limits will be based on the formula: design flow x concentration limit x conversion factor of 8.34.

Class A Wild Trout Fishery
A Class A Wild Trout stream is not impacted by this discharge.

Anti-backsliding Requirements
Unless stated otherwise in this fact sheet, all permit requirements proposed in this fact sheet are at least as stringent as those specified in the existing permit.

Whole Effluent Toxicity (WET)

The permit amended in 2015 required Shippensburg to conduct a Whole Effluent Toxicity (WET) testing once the construction is complete. This decision was made because it has been widely known that adjustment or reconfiguration to the plant operation during any construction could potentially generate a sample interference for WET testing and thus, testing results may not be accurate. However, since the construction (upgrade) has not been completed and DEP tends to move forward with this permit renewal, DEP has requested Shippensburg to provide four (4) quarterly WET testing results for this permit renewal review.

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:

The dilution series used for the tests was: 100%, 84%, 68%, 34%, and 17%. The Target Instream Waste Concentration (TIWC) to be used for analysis of the results is: 68%.

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	
May 2021	100	100		100	100		Yes
August 2021	100	100		100	100		Yes
October 2021	100	100		100	100		Yes
January 2022	100	100		100	100		Yes

***** *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: A Whole Effluent Toxicity Analysis Spreadsheet is attached to this fact sheet.

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

Acute Partial Mix Factor (PMFa): **1.0** Chronic Partial Mix Factor (PMFc): **1.0**

1. Determine IWC – Acute (IWCa):

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

[(4.95 MGD x 1.547) / ((3.06 cfs x 1) + (4.95 MGD x 1.547))] x 100 = **71%**

Is IWCa < 1%? ☐ **YES** ☒ **NO** **(YES - Acute Tests Required OR NO - Chronic Tests Required)**

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

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

2b-1. Determine Target IWCc (If Chronic Tests Required) for 4.3 MGD

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

[(4.3 MGD x 1.547) / ((3.06 cfs x 1) + (4.3 MGD x 1.547))] x 100 = **68%**

2b-2. Determine Target IWCc (If Chronic Tests Required) for 4.95 MGD

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

[(4.95 MGD x 1.547) / ((3.06 cfs x 1) + (4.95 MGD x 1.547))] x 100 = **71%**

3. Determine Dilution Series

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

Dilution Series = 100%, 84%, 68%, 34%, and 17%. (4.30 MGD)

Dilution Series = 100%, 86%, 71%, 36%, and 18%. (4.95 MGD)

WET Limits

Has reasonable potential been determined? ☐ YES ☒ NO

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

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

N/A

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

N/A

Comments
Because the construction for the proposed upgrade is still in progress and DEP believes it may be acceptable for Shippensburg to conduct WET testing during the construction, the upcoming permit renewal will contain two (2) separate dilatation series with a target instream waste concentration for interim (4.3 MGD) and final (4.95 MGD).

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 Upon Completion of Construction.

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	Weekly Average	Instant. Maximum		
Flow (MGD)	Report	Report	XXX	XXX	XXX	XXX	Continuous	Measured
pH (S.U.)	XXX	XXX	6.0	XXX	XXX	9.0	1/day	Grab
Dissolved Oxygen	XXX	XXX	5.0	XXX	XXX	XXX	1/day	Grab
CBOD5	896	1,434 Wkly Avg	XXX	25	40	50	2/week	24-Hr Composite
Total Suspended Solids Raw Sewage Influent	Report	Report	XXX	Report	XXX	XXX	2/week	24-Hr Composite
BOD5 Raw Sewage Influent	Report	Report	XXX	Report	XXX	XXX	2/week	24-Hr Composite
Total Suspended Solids	1,075	1,613 Wkly Avg	XXX	30	45	60	2/week	24-Hr Composite
Fecal Coliform (No. /100 ml) May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	XXX	1,000	2/week	Grab
Fecal Coliform (No. /100 ml) Oct 1 - Apr 30	XXX	XXX	XXX	2,000 Geo Mean	XXX	10,000	2/week	Grab
UV Transmittance (%)	XXX	XXX	Report	XXX	XXX	XXX	1/day	Metered
Ammonia-Nitrogen May 1 - Oct 31	78	XXX	XXX	2.2	XXX	4.4	2/week	24-Hr Composite
Ammonia-Nitrogen Nov 1 - Apr 30	236	XXX	XXX	6.6	XXX	13.2	2/week	24-Hr Composite
Total Phosphorus	17.9	XXX	XXX	0.5	XXX	1.0	2/week	24-Hr Composite
E. Coli (No./100 mL)	XXX	XXX	XXX	XXX	XXX	Report	1/month	Grab
Total Aluminum	Report	Report Daily Max	XXX	Report	Report Daily Max	XXX	1/month	24-Hr Composite
Total Copper	Report	Report Daily Max	XXX	Report	Report Daily Max	XXX	1/month	24-Hr Composite
Dissolved Iron	Report	Report Daily Max	XXX	Report	Report Daily Max	XXX	1/month	24-Hr Composite
Total Iron	Report	Report Daily Max	XXX	Report	Report Daily Max	XXX	1/month	24-Hr Composite
Total Zinc	Report	Report Daily Max	XXX	Report	Report Daily Max	XXX	1/month	24-Hr Composite

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: Upon Completion of Construction 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	Weekly Average	Instant. Maximum		
Flow (MGD)	Report	Report	XXX	XXX	XXX	XXX	Continuous	Measured
pH (S.U.)	XXX	XXX	6.0	XXX	XXX	9.0	1/day	Grab
Dissolved Oxygen	XXX	XXX	5.0	XXX	XXX	XXX	1/day	Grab
CBOD5	1,032	1,651 Wkly Avg	XXX	25	40	50	2/week	24-Hr Composite
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	1,238	1,857 Wkly Avg	XXX	30	45	60	2/week	24-Hr Composite
Fecal Coliform (CFU/100 ml) May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	XXX	1,000	2/week	Grab
Fecal Coliform (CFU/100 ml) Oct 1 - Apr 30	XXX	XXX	XXX	2,000 Geo Mean	XXX	10,000	2/week	Grab
UV Transmittance (%)	XXX	XXX	Report	XXX	XXX	XXX	1/day	Metered
Ammonia-Nitrogen May 1 - Oct 31	86	XXX	XXX	2.1	XXX	4.2	2/week	24-Hr Composite
Ammonia-Nitrogen Nov 1 - Apr 30	260	XXX	XXX	6.3	XXX	12.6	2/week	24-Hr Composite
Total Phosphorus	20.6	XXX	XXX	0.5	XXX	1.0	2/week	24-Hr Composite
E. Coli (No./100 mL)	XXX	XXX	XXX	XXX	XXX	Report	1/month	Grab
Total Aluminum	Report	Report Daily Max	XXX	Report	Report Daily Max	XXX	1/month	24-Hr Composite
Total Copper	Report	Report Daily Max	XXX	Report	Report Daily Max	XXX	1/month	24-Hr Composite
Dissolved Iron	Report	Report Daily Max	XXX	Report	Report Daily Max	XXX	1/month	24-Hr Composite
Total Iron	Report	Report Daily Max	XXX	Report	Report Daily Max	XXX	1/month	24-Hr Composite
Total Zinc	Report	Report Daily Max	XXX	Report	Report Daily Max	XXX	1/month	24-Hr Composite

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)		Concentrations (mg/L)			Minimum Measurement Frequency	Required Sample Type
	Monthly	Annual	Minimum	Monthly Average	Maximum		
Ammonia---N	Report	Report	XXX	Report	XXX	2/week	24-Hr Composite
Kjeldahl---N	Report	XXX	XXX	Report	XXX	2/week	24-Hr Composite
Nitrate-Nitrite as N	Report	XXX	XXX	Report	XXX	2/week	24-Hr Composite
Total Nitrogen	Report	Report	XXX	Report	XXX	1/month	Calculation
Total Phosphorus	Report	Report	XXX	Report	XXX	2/week	24-Hr Composite
Net Total Nitrogen	XXX	60,273	XXX	XXX	XXX	1/month	Calculation
Net Total Phosphorus	XXX	8,036	XXX	XXX	XXX	1/month	Calculation

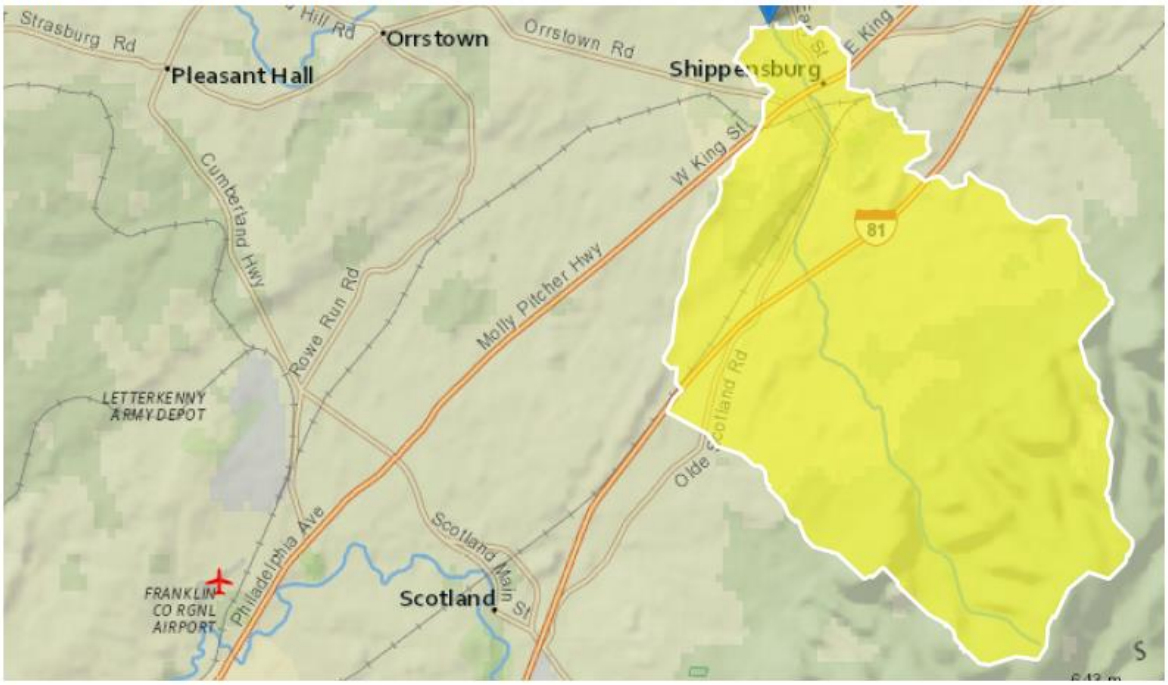
Tools and References Used to Develop Permit	
☐	WQM for Windows Model (see Attachment)
☐	Toxics Management Spreadsheet (see Attachment)
☐	TRC Model Spreadsheet (see Attachment)
☐	Temperature Model Spreadsheet (see Attachment)
☐	Water Quality Toxics Management Strategy, 361-0100-003, 4/06.
☐	Technical Guidance for the Development and Specification of Effluent Limitations, 362-0400-001, 10/97.
☐	Policy for Permitting Surface Water Diversions, 362-2000-003, 3/98.
☐	Policy for Conducting Technical Reviews of Minor NPDES Renewal Applications, 362-2000-008, 11/96.
☐	Technology-Based Control Requirements for Water Treatment Plant Wastes, 362-2183-003, 10/97.
☐	Technical Guidance for Development of NPDES Permit Requirements Steam Electric Industry, 362-2183-004, 12/97.
☐	Pennsylvania CSO Policy, 385-2000-011, 9/08.
☐	Water Quality Antidegradation Implementation Guidance, 391-0300-002, 11/03.
☐	Implementation Guidance Evaluation & Process Thermal Discharge (316(a)) Federal Water Pollution Act, 391-2000-002, 4/97.
☐	Determining Water Quality-Based Effluent Limits, 391-2000-003, 12/97.
☐	Implementation Guidance Design Conditions, 391-2000-006, 9/97.
☐	Technical Reference Guide (TRG) WQM 7.0 for Windows, Wasteload Allocation Program for Dissolved Oxygen and Ammonia Nitrogen, Version 1.0, 391-2000-007, 6/2004.
☐	Interim Method for the Sampling and Analysis of Osmotic Pressure on Streams, Brines, and Industrial Discharges, 391-2000-008, 10/1997.
☐	Implementation Guidance for Section 95.6 Management of Point Source Phosphorus Discharges to Lakes, Ponds, and Impoundments, 391-2000-010, 3/99.
☐	Technical Reference Guide (TRG) PENTOXSD for Windows, PA Single Discharge Wasteload Allocation Program for Toxics, Version 2.0, 391-2000-011, 5/2004.
☐	Implementation Guidance for Section 93.7 Ammonia Criteria, 391-2000-013, 11/97.
☐	Policy and Procedure for Evaluating Wastewater Discharges to Intermittent and Ephemeral Streams, Drainage Channels and Swales, and Storm Sewers, 391-2000-014, 4/2008.
☐	Implementation Guidance Total Residual Chlorine (TRC) Regulation, 391-2000-015, 11/1994.
☐	Implementation Guidance for Temperature Criteria, 391-2000-017, 4/09.
☐	Implementation Guidance for Section 95.9 Phosphorus Discharges to Free Flowing Streams, 391-2000-018, 10/97.
☐	Implementation Guidance for Application of Section 93.5(e) for Potable Water Supply Protection Total Dissolved Solids, Nitrite-Nitrate, Non-Priority Pollutant Phenolics and Fluorides, 391-2000-019, 10/97.
☐	Field Data Collection and Evaluation Protocol for Determining Stream and Point Source Discharge Design Hardness, 391-2000-021, 3/99.
☐	Implementation Guidance for the Determination and Use of Background/Ambient Water Quality in the Determination of Wasteload Allocations and NPDES Effluent Limitations for Toxic Substances, 391-2000-022, 3/1999.
☐	Design Stream Flows, 391-2000-023, 9/98.
☐	Field Data Collection and Evaluation Protocol for Deriving Daily and Hourly Discharge Coefficients of Variation (CV) and Other Discharge Characteristics, 391-2000-024, 10/98.
☐	Evaluations of Phosphorus Discharges to Lakes, Ponds and Impoundments, 391-3200-013, 6/97.
☐	Pennsylvania's Chesapeake Bay Tributary Strategy Implementation Plan for NPDES Permitting, 4/07.
☐	SOP:
☐	Other:

Attachments

1. StreamStats

StreamStats Report

Region ID: PA
Workspace ID: PA20211022141501202000
Clicked Point (Latitude, Longitude): 40.05971, -77.53146
Time: 2021-10-22 10:15:21 -0400



Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	20.6	square miles
PRECIP	Mean Annual Precipitation	41	inches
STRDEN	Stream Density -- total length of streams divided by drainage area	1.36	miles per square mile
ROCKDEP	Depth to rock	5.7	feet
CARBON	Percentage of area of carbonate rock	59.73	percent

Low-Flow Statistics Parameters [Low Flow Region 2]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	20.6	square miles	4.93	1280
PRECIP	Mean Annual Precipitation	41	inches	35	50.4
STRDEN	Stream Density	1.36	miles per square mile	0.51	3.1
ROCKDEP	Depth to Rock	5.7	feet	3.32	5.65
CARBON	Percent Carbonate	59.73	percent	0	99

Low-Flow Statistics Disclaimers [Low Flow Region 2]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors

Low-Flow Statistics Flow Report [Low Flow Region 2]

Statistic	Value	Unit
7 Day 2 Year Low Flow	8.78	ft^3/s
30 Day 2 Year Low Flow	9.46	ft^3/s
7 Day 10 Year Low Flow	6.74	ft^3/s
30 Day 10 Year Low Flow	7.01	ft^3/s
90 Day 10 Year Low Flow	7.49	ft^3/s

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/)

2. WQM 7.0 ver. 1.1 (4.3 MGD)

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
07B	10602	MIDDLE SPRING CREEK	**5.430**	620.00	20.60	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	0.149	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
Shippensburg	PA0030643	4.3000	4.3000	4.3000	0.000	20.00	7.00

Parameter Data

Parameter Name	Disc Conc (mg/L)	Trib Conc (mg/L)	Stream Conc (mg/L)	Fate Coef (1/days)
CBOD5	25.00	2.00	0.00	1.50
Dissolved Oxygen	5.00	8.24	0.00	0.00
NH3-N	2.20	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
07B	10602	MIDDLE SPRING CREEK	**4.220**	594.00	41.30	0.00000	0.00	☑

Stream Data

Design Cond.	LFY (cfsm)	Trib Flow (cfs)	Stream Flow (cfs)	Rch Trav Time (days)	Rch Velocity (fps)	WD Ratio	Rch Width (ft)	Rch Depth (ft)	Tributary Temp (°C)	Tributary pH	Stream Temp (°C)	Stream pH
Q7-10	0.149	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	0.00	7.00

Parameter Data

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

WQM 7.0 Hydrodynamic Outputs

SWP Basin	Stream Code	Stream Name
07B	10602	MIDDLE SPRING CREEK

RMI	Stream Flow (cfs)	PWS With (cfs)	Net Stream Flow (cfs)	Disc Analysis Flow (cfs)	Reach Slope (ft/ft)	Depth (ft)	Width (ft)	W/D Ratio	Velocity (fps)	Reach Trav Time (days)	Analysis Temp (°C)	Analysis pH
Q7-10 Flow												
5.430	3.07	0.00	3.07	6.6521	0.00407	.707	36.22	51.19	0.38	0.195	20.00	7.00
Q1-10 Flow												
5.430	2.73	0.00	2.73	6.6521	0.00407	NA	NA	NA	0.37	0.199	20.00	7.00
Q30-10 Flow												
5.430	3.64	0.00	3.64	6.6521	0.00407	NA	NA	NA	0.39	0.189	20.00	7.00

WQM 7.0 D.O.Simulation

SWP Basin	Stream Code	Stream Name
07B	10602	MIDDLE SPRING CREEK

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
5.430	4.300	20.000	7.000
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
36.219	0.707	51.194	0.379
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
17.74	1.438	1.51	0.700
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
6.024	14.670	Tsivoglou	5
Reach Travel Time (days)			
0.195			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.019	17.25	1.48	6.08
0.039	16.77	1.46	6.15
0.058	16.31	1.45	6.21
0.078	15.86	1.43	6.28
0.097	15.42	1.41	6.35
0.117	14.99	1.39	6.42
0.136	14.58	1.37	6.48
0.156	14.17	1.35	6.55
0.175	13.78	1.33	6.61
0.195	13.40	1.31	6.68

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	0.89	Use Inputted Reach Travel Times	☐
Q30-10/Q7-10 Ratio	1.185	Temperature Adjust Kr	☑
D.O. Saturation	90.00%	Use Balanced Technology	☑
D.O. Goal	5		

WQM 7.0 Wasteload Allocations

SWP Basin	Stream Code	Stream Name
07B	10602	MIDDLE SPRING CREEK

NH3-N Acute Allocations

RMI	Discharge Name	Baseline Criterion (mg/L)	Baseline WLA (mg/L)	Multiple Criterion (mg/L)	Multiple WLA (mg/L)	Critical Reach	Percent Reduction
5.430	Shippensburg	16.76	4.4	16.76	4.4	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
5.430	Shippensburg	1.89	2.2	1.89	2.2	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)		
5.43	Shippensburg	25	25	2.2	2.2	5	5	0	0

WQM 7.0 Effluent Limits

SWP Basin	Stream Code	Stream Name
07B	10602	MIDDLE SPRING CREEK

RMI	Name	Permit Number	Disc Flow (mgd)	Parameter	Effl. Limit 30-day Ave. (mg/L)	Effl. Limit Maximum (mg/L)	Effl. Limit Minimum (mg/L)
5.430	Shippensburg	PA0030643	4.300	CBOD5	25		
				NH3-N	2.2	4.4	
				Dissolved Oxygen			5

3. WQM 7.0 ver. 1.1 (4.95 MGD)

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
07B	10602	MIDDLE SPRING CREEK	**5.430**	620.00	20.60	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	0.149	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
Shippensburg	PA0030643	4.9500	4.9500	4.9500	0.000	20.00	7.00

Parameter Data

Parameter Name	Disc Conc (mg/L)	Trib Conc (mg/L)	Stream Conc (mg/L)	Fate Coef (1/days)
CBOD5	25.00	2.00	0.00	1.50
Dissolved Oxygen	5.00	8.24	0.00	0.00
NH3-N	2.10	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
07B	10602	MIDDLE SPRING CREEK	**4.220**	594.00	41.30	0.00000	0.00	☑

Stream Data

Design Cond.	LFY (cfsm)	Trib Flow (cfs)	Stream Flow (cfs)	Rch Trav Time (days)	Rch Velocity (fps)	WD Ratio	Rch Width (ft)	Rch Depth (ft)	Tributary Temp (°C)	Tributary pH	Stream Temp (°C)	Stream pH
Q7-10	0.149	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	0.00	7.00

Parameter Data

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

WQM 7.0 Hydrodynamic Outputs

SWP Basin	Stream Code	Stream Name
07B	10602	MIDDLE SPRING CREEK

RMI	Stream Flow (cfs)	PWS With (cfs)	Net Stream Flow (cfs)	Disc Analysis Flow (cfs)	Reach Slope (ft/ft)	Depth (ft)	Width (ft)	W/D Ratio	Velocity (fps)	Reach Trav Time (days)	Analysis Temp (°C)	Analysis pH
Q7-10 Flow												
5.430	3.07	0.00	3.07	7.6576	0.00407	.716	37.39	52.24	0.40	0.184	20.00	7.00
Q1-10 Flow												
5.430	2.73	0.00	2.73	7.6576	0.00407	NA	NA	NA	0.39	0.188	20.00	7.00
Q30-10 Flow												
5.430	3.64	0.00	3.64	7.6576	0.00407	NA	NA	NA	0.41	0.179	20.00	7.00

WQM 7.0 D.O.Simulation

SWP Basin	Stream Code	Stream Name
07B	10602	MIDDLE SPRING CREEK

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
5.430	4.950	20.000	7.000
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
37.388	0.716	52.238	0.401
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
18.42	1.447	1.50	0.700
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
5.928	11.133	Tsivoglou	5
Reach Travel Time (days)			
0.184			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.018	17.93	1.48	5.79
0.037	17.46	1.46	5.70
0.055	17.00	1.44	5.64
0.074	16.55	1.42	5.61
0.092	16.12	1.41	5.60
0.111	15.69	1.39	5.61
0.129	15.28	1.37	5.64
0.148	14.88	1.35	5.67
0.166	14.49	1.33	5.72
0.184	14.11	1.32	5.77

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	0.89	Use Inputted Reach Travel Times	☐
Q30-10/Q7-10 Ratio	1.185	Temperature Adjust Kr	☑
D.O. Saturation	90.00%	Use Balanced Technology	☑
D.O. Goal	5		

WQM 7.0 Wasteload Allocations

SWP Basin	Stream Code	Stream Name
07B	10602	MIDDLE SPRING CREEK

NH3-N Acute Allocations

RMI	Discharge Name	Baseline Criterion (mg/L)	Baseline WLA (mg/L)	Multiple Criterion (mg/L)	Multiple WLA (mg/L)	Critical Reach	Percent Reduction
5.430	Shippensburg	16.76	4.2	16.76	4.2	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
5.430	Shippensburg	1.89	2.1	1.89	2.1	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)		
5.43	Shippensburg	25	25	2.1	2.1	5	5	0	0

WQM 7.0 Effluent Limits

SWP Basin	Stream Code	Stream Name
07B	10602	MIDDLE SPRING CREEK

RMI	Name	Permit Number	Disc Flow (mgd)	Parameter	Effl. Limit 30-day Ave. (mg/L)	Effl. Limit Maximum (mg/L)	Effl. Limit Minimum (mg/L)
5.430	Shippensburg	PA0030643	4.950	CBOD5	25		
				NH3-N	2.1	4.2	
				Dissolved Oxygen			5

4. Toxics Management Spreadsheet (4.3 MGD)

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Toxics Management Spreadsheet
Version 1.3, March 2021

Discharge Information

Instructions | Discharge | Stream

Facility: **Shippensburg STP** NPDES Permit No.: **PA0030643** Outfall No.: **001**

Evaluation Type: **Major Sewage / Industrial Waste** Wastewater Description: **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
4.3	140	7						

					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		554									
	Chloride (PWS)	mg/L		10.1									
	Bromide	mg/L		0.25									
	Sulfate (PWS)	mg/L		5									
	Fluoride (PWS)	mg/L											
Group 2	Total Aluminum	µg/L		150									
	Total Antimony	µg/L	<	1									
	Total Arsenic	µg/L	<	1.5									
	Total Barium	µg/L	<	50									
	Total Beryllium	µg/L	<	0.5									
	Total Boron	µg/L		120									
	Total Cadmium	µg/L	<	0.2									
	Total Chromium (III)	µg/L	<	1									
	Hexavalent Chromium	µg/L	<	1									
	Total Cobalt	µg/L	<	1									
	Total Copper	µg/L		7.2									
	Free Cyanide	µg/L	<	1									
	Total Cyanide	µg/L	<	5									
	Dissolved Iron	µg/L		90									
	Total Iron	µg/L		220									
	Total Lead	µg/L	<	1									
	Total Manganese	µg/L	<	20									
	Total Mercury	µg/L	<	0.2									
	Total Nickel	µg/L		2.7									
	Total Phenols (Phenolics) (PWS)	µg/L	<	5									
	Total Selenium	µg/L	<	2									
	Total Silver	µg/L	<	0.5									
	Total Thallium	µg/L	<	0.5									
	Total Zinc	µg/L		58									
	Total Molybdenum	µg/L		3.1									
	Acrolein	µg/L	<	2									
	Acrylamide	µg/L	<										
	Acrylonitrile	µg/L	<	5									
	Benzene	µg/L	<	0.5									
	Bromoform	µg/L	<	1									

Discharge Information 8/1/2022 Page 1

Group 3	Carbon Tetrachloride	µg/L	<	0.5									
	Chlorobenzene	µg/L		1									
	Chlorodibromomethane	µg/L	<	0.5									
	Chloroethane	µg/L	<	1									
	2-Chloroethyl Vinyl Ether	µg/L	<	2									
	Chloroform	µg/L	<	1									
	Dichlorobromomethane	µg/L	<	0.5									
	1,1-Dichloroethane	µg/L	<	1									
	1,2-Dichloroethane	µg/L	<	1									
	1,1-Dichloroethylene	µg/L	<	1									
	1,2-Dichloropropane	µg/L	<	0.5									
	1,3-Dichloropropylene	µg/L	<	0.5									
	1,4-Dioxane	µg/L	<	1									
	Ethylbenzene	µg/L	<	1									
	Methyl Bromide	µg/L	<	1									
	Methyl Chloride	µg/L	<	1									
	Methylene Chloride	µg/L	<	1									
	1,1,2,2-Tetrachloroethane	µg/L	<	0.5									
	Tetrachloroethylene	µg/L	<	1									
	Toluene	µg/L	<	1									
	1,2-trans-Dichloroethylene	µg/L	<	1									
	1,1,1-Trichloroethane	µg/L	<	1									
	1,1,2-Trichloroethane	µg/L	<	0.5									
	Trichloroethylene	µg/L	<	0.5									
	Vinyl Chloride	µg/L	<	0.5									
Group 4	2-Chlorophenol	µg/L	<	2.8									
	2,4-Dichlorophenol	µg/L	<	2.8									
	2,4-Dimethylphenol	µg/L	<	2.8									
	4,6-Dinitro-o-Cresol	µg/L	<	2.8									
	2,4-Dinitrophenol	µg/L	<	5.6									
	2-Nitrophenol	µg/L	<	2.8									
	4-Nitrophenol	µg/L	<	2.8									
	p-Chloro-m-Cresol	µg/L	<	2.8									
	Pentachlorophenol	µg/L	<	5.6									
	Phenol	µg/L	<	7.4									
	2,4,6-Trichlorophenol	µg/L	<	2.8									
Group 5	Acenaphthene	µg/L	<	1.4									
	Acenaphthylene	µg/L	<	1.4									
	Anthracene	µg/L	<	1.4									
	Benzidine	µg/L	<	7.4									
	Benzo(a)Anthracene	µg/L	<	1.4									
	Benzo(a)Pyrene	µg/L	<	1.4									
	3,4-Benzofluoranthene	µg/L	<	1.4									
	Benzo(ghi)Perylene	µg/L	<	1.4									
	Benzo(k)Fluoranthene	µg/L	<	1.4									
	Bis(2-Chloroethoxy)Methane	µg/L	<	2.8									
	Bis(2-Chloroethyl)Ether	µg/L	<	2.8									
	Bis(2-Chloroisopropyl)Ether	µg/L	<	2.8									
	Bis(2-Ethylhexyl)Phthalate	µg/L	<	3									
	4-Bromophenyl Phenyl Ether	µg/L	<	2.8									
	Butyl Benzyl Phthalate	µg/L	<	2.8									
	2-Chloronaphthalene	µg/L	<	2.8									
	4-Chlorophenyl Phenyl Ether	µg/L	<	2.8									
	Chrysene	µg/L	<	1.4									
	Dibenzo(a,h)Anthrancene	µg/L	<	1.4									
	1,2-Dichlorobenzene	µg/L	<	1.4									
	1,3-Dichlorobenzene	µg/L	<	1.4									
	1,4-Dichlorobenzene	µg/L	<	2.8									
	3,3-Dichlorobenzidine	µg/L	<	2.8									
	Diethyl Phthalate	µg/L	<	2.8									
	Dimethyl Phthalate	µg/L	<	2.8									
	Di-n-Butyl Phthalate	µg/L	<	2.8									
	2,4-Dinitrotoluene	µg/L	<	2.8									

	2,6-Dinitrotoluene	µg/L	<	2.8									
	Di-n-Octyl Phthalate	µg/L	<	2.8									
	1,2-Diphenylhydrazine	µg/L	<	2.8									
	Fluoranthene	µg/L	<	1.4									
	Fluorene	µg/L	<	1.4									
	Hexachlorobenzene	µg/L	<	2.8									
	Hexachlorobutadiene	µg/L	<	0.5									
	Hexachlorocyclopentadiene	µg/L	<	2.8									
	Hexachloroethane	µg/L	<	2.8									
	Indeno(1,2,3-cd)Pyrene	µg/L	<	1.4									
	Isophorone	µg/L	<	2.8									
	Naphthalene	µg/L	<	1.4									
	Nitrobenzene	µg/L	<	2.8									
	n-Nitrosodimethylamine	µg/L	<	2.8									
	n-Nitrosodi-n-Propylamine	µg/L	<	2.8									
	n-Nitrosodiphenylamine	µg/L	<	2.8									
	Phenanthrene	µg/L	<	1.4									
	Pyrene	µg/L	<	1.4									
	1,2,4-Trichlorobenzene	µg/L	<	0.5									
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											

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Toxics Management Spreadsheet
Version 1.3, March 2021

Stream / Surface Water Information

Shippensburg STP, NPDES Permit No. PA0030643, Outfall 001

Instructions | Discharge | *Stream*

Receiving Surface Water Name: **Middle Spring Creek**

No. Reaches to Model: 1

- (•) Statewide Criteria
- ( ) Great Lakes Criteria
- ( ) ORSANCO Criteria

Location	Stream Code*	RMI*	Elevation (ft)*	DA (mi^2)*	Slope (ft/ft)	PWS Withdrawal (MGD)	Apply Fish Criteria*
Point of Discharge	010602	5.43	620	20.6			Yes
End of Reach 1	010602	4.22	594	41.3			Yes

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

Location	RMI	LFY (cfs/mi^2)*	Flow (cfs)		W/D Ratio	Width (ft)	Depth (ft)	Velocity (fps)	Travel Time (days)	Tributary		Stream		Analysis	
			Stream	Tributary						Hardness	pH	Hardness*	pH*	Hardness	pH
Point of Discharge	5.43	0.149										100	7		
End of Reach 1	4.22	0.149													

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	5.43														
End of Reach 1	4.22														

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Toxics Management Spreadsheet
Version 1.3, March 2021

Model Results

Shippensburg STP, NPDES Permit No. PA0030643, Outfall 001

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

☑ ***Hydrodynamics***

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

RMI	Stream Flow (cfs)	PWS Withdrawal (cfs)	Net Stream Flow (cfs)	Discharge Analysis Flow (cfs)	Slope (ft/ft)	Depth (ft)	Width (ft)	W/D Ratio	Velocity (fps)	Travel Time (days)	Complete Mix Time (min)
5.43	3.07		3.07	6.652	0.004	0.707	36.219	51.194	0.379	0.195	4.722
4.22	6.15		6.1537								

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)
5.43	19.80		19.80	6.652	0.004	1.099	36.219	32.956	0.665	0.111	13.707
4.22	36.366		36.37								

☑ ***Wasteload Allocations***

☑ ***AFC*** CCT (min): 4.722 PMF: 1 Analysis Hardness (mg/l): 127.37 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	750	750	1,096	
Total Antimony	0	0		0	1,100	1,100	1,608	
Total Arsenic	0	0		0	340	340	497	Chem Translator of 1 applied
Total Barium	0	0		0	21,000	21,000	30,690	
Total Boron	0	0		0	8,100	8,100	11,837	
Total Cadmium	0	0		0	2.548	2.73	3.99	Chem Translator of 0.934 applied
Total Chromium (III)	0	0		0	694.619	2,198	3,212	Chem Translator of 0.316 applied
Hexavalent Chromium	0	0		0	16	16.3	23.8	Chem Translator of 0.982 applied
Total Cobalt	0	0		0	95	95.0	139	
Total Copper	0	0		0	16.880	17.6	25.7	Chem Translator of 0.96 applied
Free Cyanide	0	0		0	22	22.0	32.2	

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	83.958	111	162	Chem Translator of 0.756 applied
Total Manganese	0	0		0	N/A	N/A	N/A	
Total Mercury	0	0		0	1.400	1.65	2.41	Chem Translator of 0.85 applied
Total Nickel	0	0		0	574.584	576	841	Chem Translator of 0.998 applied
Total Phenols (Phenolics) (PWS)	0	0		0	N/A	N/A	N/A	
Total Selenium	0	0		0	N/A	N/A	N/A	Chem Translator of 0.922 applied
Total Silver	0	0		0	4.877	5.74	8.38	Chem Translator of 0.85 applied
Total Thallium	0	0		0	65	65.0	95.0	
Total Zinc	0	0		0	143.840	147	215	Chem Translator of 0.978 applied
Acrolein	0	0		0	3	3.0	4.38	
Acrylonitrile	0	0		0	650	650	950	
Benzene	0	0		0	640	640	935	
Bromoform	0	0		0	1,800	1,800	2,631	
Carbon Tetrachloride	0	0		0	2,800	2,800	4,092	
Chlorobenzene	0	0		0	1,200	1,200	1,754	
Chlorodibromomethane	0	0		0	N/A	N/A	N/A	
2-Chloroethyl Vinyl Ether	0	0		0	18,000	18,000	26,306	
Chloroform	0	0		0	1,900	1,900	2,777	
Dichlorobromomethane	0	0		0	N/A	N/A	N/A	
1,2-Dichloroethane	0	0		0	15,000	15,000	21,921	
1,1-Dichloroethylene	0	0		0	7,500	7,500	10,961	
1,2-Dichloropropane	0	0		0	11,000	11,000	16,076	
1,3-Dichloropropylene	0	0		0	310	310	453	
Ethylbenzene	0	0		0	2,900	2,900	4,238	
Methyl Bromide	0	0		0	550	550	804	
Methyl Chloride	0	0		0	28,000	28,000	40,920	
Methylene Chloride	0	0		0	12,000	12,000	17,537	
1,1,2,2-Tetrachloroethane	0	0		0	1,000	1,000	1,461	
Tetrachloroethylene	0	0		0	700	700	1,023	
Toluene	0	0		0	1,700	1,700	2,484	
1,2-trans-Dichloroethylene	0	0		0	6,800	6,800	9,938	
1,1,1-Trichloroethane	0	0		0	3,000	3,000	4,384	
1,1,2-Trichloroethane	0	0		0	3,400	3,400	4,969	
Trichloroethylene	0	0		0	2,300	2,300	3,361	
Vinyl Chloride	0	0		0	N/A	N/A	N/A	
2-Chlorophenol	0	0		0	560	560	818	
2,4-Dichlorophenol	0	0		0	1,700	1,700	2,484	
2,4-Dimethylphenol	0	0		0	660	660	965	
4,6-Dinitro-o-Cresol	0	0		0	80	80.0	117	
2,4-Dinitrophenol	0	0		0	660	660	965	
2-Nitrophenol	0	0		0	8,000	8,000	11,691	
4-Nitrophenol	0	0		0	2,300	2,300	3,361	
p-Chloro-m-Cresol	0	0		0	160	160	234	
Pentachlorophenol	0	0		0	8.723	8.72	12.7	
Phenol	0	0		0	N/A	N/A	N/A	
2,4,6-Trichlorophenol	0	0		0	460	460	672	

Acenaphthene	0	0		0	83	83.0	121	
Anthracene	0	0		0	N/A	N/A	N/A	
Benzidine	0	0		0	300	300	438	
Benzo(a)Anthracene	0	0		0	0.5	0.5	0.73	
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	43,843	
Bis(2-Chloroisopropyl)Ether	0	0		0	N/A	N/A	N/A	
Bis(2-Ethylhexyl)Phthalate	0	0		0	4,500	4,500	6,576	
4-Bromophenyl Phenyl Ether	0	0		0	270	270	395	
Butyl Benzyl Phthalate	0	0		0	140	140	205	
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	1,198	
1,3-Dichlorobenzene	0	0		0	350	350	511	
1,4-Dichlorobenzene	0	0		0	730	730	1,067	
3,3-Dichlorobenzidine	0	0		0	N/A	N/A	N/A	
Diethyl Phthalate	0	0		0	4,000	4,000	5,846	
Dimethyl Phthalate	0	0		0	2,500	2,500	3,654	
Di-n-Butyl Phthalate	0	0		0	110	110	161	
2,4-Dinitrotoluene	0	0		0	1,600	1,600	2,338	
2,6-Dinitrotoluene	0	0		0	990	990	1,447	
1,2-Diphenylhydrazine	0	0		0	15	15.0	21.9	
Fluoranthene	0	0		0	200	200	292	
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	14.6	
Hexachlorocyclopentadiene	0	0		0	5	5.0	7.31	
Hexachloroethane	0	0		0	60	60.0	87.7	
Indeno(1,2,3-cd)Pyrene	0	0		0	N/A	N/A	N/A	
Isophorone	0	0		0	10,000	10,000	14,614	
Naphthalene	0	0		0	140	140	205	
Nitrobenzene	0	0		0	4,000	4,000	5,846	
n-Nitrosodimethylamine	0	0		0	17,000	17,000	24,844	
n-Nitrosodi-n-Propylamine	0	0		0	N/A	N/A	N/A	
n-Nitrosodiphenylamine	0	0		0	300	300	438	
Phenanthrene	0	0		0	5	5.0	7.31	
Pyrene	0	0		0	N/A	N/A	N/A	
1,2,4-Trichlorobenzene	0	0		0	130	130	190	

☑ ***CFC*** CCT (min): 4.722 PMF: 1 Analysis Hardness (mg/l): 127.37 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	322	
Total Arsenic	0	0		0	150	150	219	Chem Translator of 1 applied
Total Barium	0	0		0	4,100	4,100	5,992	
Total Boron	0	0		0	1,600	1,600	2,338	
Total Cadmium	0	0		0	0.291	0.32	0.47	Chem Translator of 0.899 applied
Total Chromium (III)	0	0		0	90.356	105	154	Chem Translator of 0.86 applied
Hexavalent Chromium	0	0		0	10	10.4	15.2	Chem Translator of 0.962 applied
Total Cobalt	0	0		0	19	19.0	27.8	
Total Copper	0	0		0	11.012	11.5	16.8	Chem Translator of 0.96 applied
Free Cyanide	0	0		0	5.2	5.2	7.6	
Dissolved Iron	0	0		0	N/A	N/A	N/A	
Total Iron	0	0		0	1,500	1,500	2,192	WQC = 30 day average; PMF = 1
Total Lead	0	0		0	3.272	4.33	6.33	Chem Translator of 0.756 applied
Total Manganese	0	0		0	N/A	N/A	N/A	
Total Mercury	0	0		0	0.770	0.91	1.32	Chem Translator of 0.85 applied
Total Nickel	0	0		0	63.819	64.0	93.5	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	7.29	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	19.0	
Total Zinc	0	0		0	145.017	147	215	Chem Translator of 0.986 applied
Acrolein	0	0		0	3	3.0	4.38	
Acrylonitrile	0	0		0	130	130	190	
Benzene	0	0		0	130	130	190	
Bromoform	0	0		0	370	370	541	
Carbon Tetrachloride	0	0		0	560	560	818	
Chlorobenzene	0	0		0	240	240	351	
Chlorodibromomethane	0	0		0	N/A	N/A	N/A	
2-Chloroethyl Vinyl Ether	0	0		0	3,500	3,500	5,115	
Chloroform	0	0		0	390	390	570	
Dichlorobromomethane	0	0		0	N/A	N/A	N/A	
1,2-Dichloroethane	0	0		0	3,100	3,100	4,530	
1,1-Dichloroethylene	0	0		0	1,500	1,500	2,192	
1,2-Dichloropropane	0	0		0	2,200	2,200	3,215	
1,3-Dichloropropylene	0	0		0	61	61.0	89.1	
Ethylbenzene	0	0		0	580	580	848	
Methyl Bromide	0	0		0	110	110	161	
Methyl Chloride	0	0		0	5,500	5,500	8,038	
Methylene Chloride	0	0		0	2,400	2,400	3,507	
1,1,2,2-Tetrachloroethane	0	0		0	210	210	307	
Tetrachloroethylene	0	0		0	140	140	205	
Toluene	0	0		0	330	330	482	

1,2-trans-Dichloroethylene	0	0		0	1,400	1,400	2,046	
1,1,1-Trichloroethane	0	0		0	610	610	891	
1,1,2-Trichloroethane	0	0		0	680	680	994	
Trichloroethylene	0	0		0	450	450	658	
Vinyl Chloride	0	0		0	N/A	N/A	N/A	
2-Chlorophenol	0	0		0	110	110	161	
2,4-Dichlorophenol	0	0		0	340	340	497	
2,4-Dimethylphenol	0	0		0	130	130	190	
4,6-Dinitro-o-Cresol	0	0		0	16	16.0	23.4	
2,4-Dinitrophenol	0	0		0	130	130	190	
2-Nitrophenol	0	0		0	1,600	1,600	2,338	
4-Nitrophenol	0	0		0	470	470	687	
p-Chloro-m-Cresol	0	0		0	500	500	731	
Pentachlorophenol	0	0		0	6.693	6.69	9.78	
Phenol	0	0		0	N/A	N/A	N/A	
2,4,6-Trichlorophenol	0	0		0	91	91.0	133	
Acenaphthene	0	0		0	17	17.0	24.8	
Anthracene	0	0		0	N/A	N/A	N/A	
Benzidine	0	0		0	59	59.0	86.2	
Benzo(a)Anthracene	0	0		0	0.1	0.1	0.15	
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	8,769	
Bis(2-Chloroisopropyl)Ether	0	0		0	N/A	N/A	N/A	
Bis(2-Ethylhexyl)Phthalate	0	0		0	910	910	1,330	
4-Bromophenyl Phenyl Ether	0	0		0	54	54.0	78.9	
Butyl Benzyl Phthalate	0	0		0	35	35.0	51.1	
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	234	
1,3-Dichlorobenzene	0	0		0	69	69.0	101	
1,4-Dichlorobenzene	0	0		0	150	150	219	
3,3-Dichlorobenzidine	0	0		0	N/A	N/A	N/A	
Diethyl Phthalate	0	0		0	800	800	1,169	
Dimethyl Phthalate	0	0		0	500	500	731	
Di-n-Butyl Phthalate	0	0		0	21	21.0	30.7	
2,4-Dinitrotoluene	0	0		0	320	320	468	
2,6-Dinitrotoluene	0	0		0	200	200	292	
1,2-Diphenylhydrazine	0	0		0	3	3.0	4.38	
Fluoranthene	0	0		0	40	40.0	58.5	
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	2.92	

Hexachlorocyclopentadiene	0	0		0	1	1.0	1.46	
Hexachloroethane	0	0		0	12	12.0	17.5	
Indeno(1,2,3-cd)Pyrene	0	0		0	N/A	N/A	N/A	
Isophorone	0	0		0	2,100	2,100	3,069	
Naphthalene	0	0		0	43	43.0	62.8	
Nitrobenzene	0	0		0	810	810	1,184	
n-Nitrosodimethylamine	0	0		0	3,400	3,400	4,969	
n-Nitrosodi-n-Propylamine	0	0		0	N/A	N/A	N/A	
n-Nitrosodiphenylamine	0	0		0	59	59.0	86.2	
Phenanthrene	0	0		0	1	1.0	1.46	
Pyrene	0	0		0	N/A	N/A	N/A	
1,2,4-Trichlorobenzene	0	0		0	26	26.0	38.0	

☑ ***THH*** CCT (min): 4.722 PMF: 1 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	8.18	
Total Arsenic	0	0		0	10	10.0	14.6	
Total Barium	0	0		0	2,400	2,400	3,507	
Total Boron	0	0		0	3,100	3,100	4,530	
Total Cadmium	0	0		0	N/A	N/A	N/A	
Total Chromium (III)	0	0		0	N/A	N/A	N/A	
Hexavalent Chromium	0	0		0	N/A	N/A	N/A	
Total Cobalt	0	0		0	N/A	N/A	N/A	
Total Copper	0	0		0	N/A	N/A	N/A	
Free Cyanide	0	0		0	4	4.0	5.85	
Dissolved Iron	0	0		0	300	300	438	
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	1,461	
Total Mercury	0	0		0	0.050	0.05	0.073	
Total Nickel	0	0		0	610	610	891	
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	0.35	
Total Zinc	0	0		0	N/A	N/A	N/A	
Acrolein	0	0		0	3	3.0	4.38	
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	146	
Chlorodibromomethane	0	0		0	N/A	N/A	N/A	
2-Chloroethyl Vinyl Ether	0	0		0	N/A	N/A	N/A	
Chloroform	0	0		0	N/A	N/A	N/A	
Dichlorobromomethane	0	0		0	N/A	N/A	N/A	
1,2-Dichloroethane	0	0		0	N/A	N/A	N/A	
1,1-Dichloroethylene	0	0		0	33	33.0	48.2	
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	99.4	
Methyl Bromide	0	0		0	100	100.0	146	
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	83.3	
1,2-trans-Dichloroethylene	0	0		0	100	100.0	146	
1,1,1-Trichloroethane	0	0		0	10,000	10,000	14,614	
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	43.8	
2,4-Dichlorophenol	0	0		0	10	10.0	14.6	
2,4-Dimethylphenol	0	0		0	100	100.0	146	
4,6-Dinitro-o-Cresol	0	0		0	2	2.0	2.92	
2,4-Dinitrophenol	0	0		0	10	10.0	14.6	
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	5,846	
2,4,6-Trichlorophenol	0	0		0	N/A	N/A	N/A	
Acenaphthene	0	0		0	70	70.0	102	
Anthracene	0	0		0	300	300	438	
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	292	
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	0.15	
2-Chloronaphthalene	0	0		0	800	800	1,169	
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	1,461	
1,3-Dichlorobenzene	0	0		0	7	7.0	10.2	
1,4-Dichlorobenzene	0	0		0	300	300	438	
3,3-Dichlorobenzidine	0	0		0	N/A	N/A	N/A	
Diethyl Phthalate	0	0		0	600	600	877	
Dimethyl Phthalate	0	0		0	2,000	2,000	2,923	
Di-n-Butyl Phthalate	0	0		0	20	20.0	29.2	
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	29.2	
Fluorene	0	0		0	50	50.0	73.1	
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	5.85	
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	49.7	
Naphthalene	0	0		0	N/A	N/A	N/A	
Nitrobenzene	0	0		0	10	10.0	14.6	
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	29.2	
1,2,4-Trichlorobenzene	0	0		0	0.07	0.07	0.1	

☑ ***CRL*** CCT (min): 13.707 PMF: 1 Analysis Hardness (mg/l): N/A Analysis pH: N/A

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

Hexavalent Chromium	0	0		0	N/A	N/A	N/A	
Total Cobalt	0	0		0	N/A	N/A	N/A	
Total Copper	0	0		0	N/A	N/A	N/A	
Free Cyanide	0	0		0	N/A	N/A	N/A	
Dissolved Iron	0	0		0	N/A	N/A	N/A	
Total Iron	0	0		0	N/A	N/A	N/A	
Total Lead	0	0		0	N/A	N/A	N/A	
Total Manganese	0	0		0	N/A	N/A	N/A	
Total Mercury	0	0		0	N/A	N/A	N/A	
Total Nickel	0	0		0	N/A	N/A	N/A	
Total Phenols (Phenolics) (PWS)	0	0		0	N/A	N/A	N/A	
Total Selenium	0	0		0	N/A	N/A	N/A	
Total Silver	0	0		0	N/A	N/A	N/A	
Total Thallium	0	0		0	N/A	N/A	N/A	
Total Zinc	0	0		0	N/A	N/A	N/A	
Acrolein	0	0		0	N/A	N/A	N/A	
Acrylonitrile	0	0		0	0.06	0.06	0.24	
Benzene	0	0		0	0.58	0.58	2.31	
Bromoform	0	0		0	7	7.0	27.8	
Carbon Tetrachloride	0	0		0	0.4	0.4	1.59	
Chlorobenzene	0	0		0	N/A	N/A	N/A	
Chlorodibromomethane	0	0		0	0.8	0.8	3.18	
2-Chloroethyl Vinyl Ether	0	0		0	N/A	N/A	N/A	
Chloroform	0	0		0	5.7	5.7	22.7	
Dichlorobromomethane	0	0		0	0.95	0.95	3.78	
1,2-Dichloroethane	0	0		0	9.9	9.9	39.4	
1,1-Dichloroethylene	0	0		0	N/A	N/A	N/A	
1,2-Dichloropropane	0	0		0	0.9	0.9	3.58	
1,3-Dichloropropylene	0	0		0	0.27	0.27	1.07	
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	79.5	
1,1,2,2-Tetrachloroethane	0	0		0	0.2	0.2	0.8	
Tetrachloroethylene	0	0		0	10	10.0	39.8	
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	2.19	
Trichloroethylene	0	0		0	0.6	0.6	2.39	
Vinyl Chloride	0	0		0	0.02	0.02	0.08	
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	0.12	
Phenol	0	0		0	N/A	N/A	N/A	
2,4,6-Trichlorophenol	0	0		0	1.5	1.5	5.96	
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	0.0004	
Benzo(a)Anthracene	0	0		0	0.001	0.001	0.004	
Benzo(a)Pyrene	0	0		0	0.0001	0.0001	0.0004	
3,4-Benzofluoranthene	0	0		0	0.001	0.001	0.004	
Benzo(k)Fluoranthene	0	0		0	0.01	0.01	0.04	
Bis(2-Chloroethyl)Ether	0	0		0	0.03	0.03	0.12	
Bis(2-Chloroisopropyl)Ether	0	0		0	N/A	N/A	N/A	
Bis(2-Ethylhexyl)Phthalate	0	0		0	0.32	0.32	1.27	
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	0.48	
Dibenzo(a,h)Anthrancene	0	0		0	0.0001	0.0001	0.0004	
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	0.2	
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	0.2	
2,6-Dinitrotoluene	0	0		0	0.05	0.05	0.2	
1,2-Diphenylhydrazine	0	0		0	0.03	0.03	0.12	
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	0.0003	
Hexachlorobutadiene	0	0		0	0.01	0.01	0.04	
Hexachlorocyclopentadiene	0	0		0	N/A	N/A	N/A	
Hexachloroethane	0	0		0	0.1	0.1	0.4	
Indeno(1,2,3-cd)Pyrene	0	0		0	0.001	0.001	0.004	
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	0.003	
n-Nitrosodi-n-Propylamine	0	0		0	0.005	0.005	0.02	
n-Nitrosodiphenylamine	0	0		0	3.3	3.3	13.1	

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

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

No. Samples/Month: 4

	Mass Limits		*Concentration Limits*						
Pollutants	AML (lbs/day)	MDL (lbs/day)	AML	MDL	IMAX	Units	Governing WQBEL	WQBEL Basis	Comments
Total Aluminum	Report	Report	Report	Report	Report	µg/L	750	AFC	Discharge Conc > 10% WQBEL (no RP)
Total Copper	Report	Report	Report	Report	Report	µg/L	16.8	CFC	Discharge Conc > 10% WQBEL (no RP)
Dissolved Iron	Report	Report	Report	Report	Report	µg/L	438	THH	Discharge Conc > 10% WQBEL (no RP)
Total Iron	Report	Report	Report	Report	Report	µg/L	2,192	CFC	Discharge Conc > 10% WQBEL (no RP)
Total Zinc	Report	Report	Report	Report	Report	µg/L	147	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 Antimony	N/A	N/A	Discharge Conc < TQL

Total Arsenic	N/A	N/A	Discharge Conc < TQL
Total Barium	3,507	µg/L	Discharge Conc ≤ 10% WQBEL
Total Beryllium	N/A	N/A	No WQS
Total Boron	2,338	µg/L	Discharge Conc ≤ 10% WQBEL
Total Cadmium	0.47	µg/L	Discharge Conc < TQL
Total Chromium (III)	154	µg/L	Discharge Conc < TQL
Hexavalent Chromium	15.2	µg/L	Discharge Conc < TQL
Total Cobalt	27.8	µg/L	Discharge Conc < TQL
Free Cyanide	5.85	µg/L	Discharge Conc < TQL
Total Cyanide	N/A	N/A	No WQS
Total Lead	6.33	µg/L	Discharge Conc < TQL
Total Manganese	1,461	µg/L	Discharge Conc ≤ 10% WQBEL
Total Mercury	0.073	µg/L	Discharge Conc < TQL
Total Nickel	93.5	µg/L	Discharge Conc ≤ 10% WQBEL
Total Phenols (Phenolics) (PWS)		µg/L	Discharge Conc < TQL
Total Selenium	7.29	µg/L	Discharge Conc < TQL
Total Silver	5.74	µg/L	Discharge Conc ≤ 10% WQBEL
Total Thallium	0.35	µg/L	Discharge Conc < TQL
Total Molybdenum	N/A	N/A	No WQS
Acrolein	3.0	µg/L	Discharge Conc < TQL
Acrylonitrile	0.24	µg/L	Discharge Conc < TQL
Benzene	2.31	µg/L	Discharge Conc < TQL
Bromoform	27.8	µg/L	Discharge Conc ≤ 25% WQBEL
Carbon Tetrachloride	1.59	µg/L	Discharge Conc < TQL
Chlorobenzene	146	µg/L	Discharge Conc ≤ 25% WQBEL
Chlorodibromomethane	3.18	µg/L	Discharge Conc < TQL
Chloroethane	N/A	N/A	No WQS
2-Chloroethyl Vinyl Ether	5,115	µg/L	Discharge Conc < TQL
Chloroform	22.7	µg/L	Discharge Conc ≤ 25% WQBEL
Dichlorobromomethane	3.78	µg/L	Discharge Conc < TQL
1,1-Dichloroethane	N/A	N/A	No WQS
1,2-Dichloroethane	39.4	µg/L	Discharge Conc ≤ 25% WQBEL
1,1-Dichloroethylene	48.2	µg/L	Discharge Conc ≤ 25% WQBEL
1,2-Dichloropropane	3.58	µg/L	Discharge Conc < TQL
1,3-Dichloropropylene	1.07	µg/L	Discharge Conc < TQL
1,4-Dioxane	N/A	N/A	No WQS
Ethylbenzene	99.4	µg/L	Discharge Conc ≤ 25% WQBEL
Methyl Bromide	146	µg/L	Discharge Conc ≤ 25% WQBEL
Methyl Chloride	8,038	µg/L	Discharge Conc ≤ 25% WQBEL
Methylene Chloride	79.5	µg/L	Discharge Conc ≤ 25% WQBEL
1,1,2,2-Tetrachloroethane	0.8	µg/L	Discharge Conc < TQL
Tetrachloroethylene	39.8	µg/L	Discharge Conc ≤ 25% WQBEL
Toluene	83.3	µg/L	Discharge Conc ≤ 25% WQBEL
1,2-trans-Dichloroethylene	146	µg/L	Discharge Conc ≤ 25% WQBEL
1,1,1-Trichloroethane	891	µg/L	Discharge Conc ≤ 25% WQBEL

1,1,2-Trichloroethane	2.19	µg/L	Discharge Conc < TQL
Trichloroethylene	2.39	µg/L	Discharge Conc < TQL
Vinyl Chloride	0.08	µg/L	Discharge Conc < TQL
2-Chlorophenol	43.8	µg/L	Discharge Conc < TQL
2,4-Dichlorophenol	14.6	µg/L	Discharge Conc < TQL
2,4-Dimethylphenol	146	µg/L	Discharge Conc < TQL
4,6-Dinitro-o-Cresol	2.92	µg/L	Discharge Conc < TQL
2,4-Dinitrophenol	14.6	µg/L	Discharge Conc < TQL
2-Nitrophenol	2,338	µg/L	Discharge Conc < TQL
4-Nitrophenol	687	µg/L	Discharge Conc < TQL
p-Chloro-m-Cresol	160	µg/L	Discharge Conc < TQL
Pentachlorophenol	0.12	µg/L	Discharge Conc < TQL
Phenol	5,846	µg/L	Discharge Conc < TQL
2,4,6-Trichlorophenol	5.96	µg/L	Discharge Conc < TQL
Acenaphthene	24.8	µg/L	Discharge Conc < TQL
Acenaphthylene	N/A	N/A	No WQS
Anthracene	438	µg/L	Discharge Conc < TQL
Benzidine	0.0004	µg/L	Discharge Conc < TQL
Benzo(a)Anthracene	0.004	µg/L	Discharge Conc < TQL
Benzo(a)Pyrene	0.0004	µg/L	Discharge Conc < TQL
3,4-Benzofluoranthene	0.004	µg/L	Discharge Conc < TQL
Benzo(ghi)Perylene	N/A	N/A	No WQS
Benzo(k)Fluoranthene	0.04	µg/L	Discharge Conc < TQL
Bis(2-Chloroethoxy)Methane	N/A	N/A	No WQS
Bis(2-Chloroethyl)Ether	0.12	µg/L	Discharge Conc < TQL
Bis(2-Chloroisopropyl)Ether	292	µg/L	Discharge Conc < TQL
Bis(2-Ethylhexyl)Phthalate	1.27	µg/L	Discharge Conc < TQL
4-Bromophenyl Phenyl Ether	78.9	µg/L	Discharge Conc < TQL
Butyl Benzyl Phthalate	0.15	µg/L	Discharge Conc < TQL
2-Chloronaphthalene	1,169	µg/L	Discharge Conc < TQL
4-Chlorophenyl Phenyl Ether	N/A	N/A	No WQS
Chrysene	0.48	µg/L	Discharge Conc < TQL
Dibenzo(a,h)Anthrancene	0.0004	µg/L	Discharge Conc < TQL
1,2-Dichlorobenzene	234	µg/L	Discharge Conc ≤ 25% WQBEL
1,3-Dichlorobenzene	10.2	µg/L	Discharge Conc ≤ 25% WQBEL
1,4-Dichlorobenzene	219	µg/L	Discharge Conc ≤ 25% WQBEL
3,3-Dichlorobenzidine	0.2	µg/L	Discharge Conc < TQL
Diethyl Phthalate	877	µg/L	Discharge Conc < TQL
Dimethyl Phthalate	731	µg/L	Discharge Conc < TQL
Di-n-Butyl Phthalate	29.2	µg/L	Discharge Conc < TQL
2,4-Dinitrotoluene	0.2	µg/L	Discharge Conc < TQL
2,6-Dinitrotoluene	0.2	µg/L	Discharge Conc < TQL
Di-n-Octyl Phthalate	N/A	N/A	No WQS
1,2-Diphenylhydrazine	0.12	µg/L	Discharge Conc < TQL
Fluoranthene	29.2	µg/L	Discharge Conc < TQL

Fluorene	73.1	µg/L	Discharge Conc < TQL
Hexachlorobenzene	0.0003	µg/L	Discharge Conc < TQL
Hexachlorobutadiene	0.04	µg/L	Discharge Conc < TQL
Hexachlorocyclopentadiene	1.46	µg/L	Discharge Conc < TQL
Hexachloroethane	0.4	µg/L	Discharge Conc < TQL
Indeno(1,2,3-cd)Pyrene	0.004	µg/L	Discharge Conc < TQL
Isophorone	49.7	µg/L	Discharge Conc < TQL
Naphthalene	62.8	µg/L	Discharge Conc ≤ 25% WQBEL
Nitrobenzene	14.6	µg/L	Discharge Conc < TQL
n-Nitrosodimethylamine	0.003	µg/L	Discharge Conc < TQL
n-Nitrosodi-n-Propylamine	0.02	µg/L	Discharge Conc < TQL
n-Nitrosodiphenylamine	13.1	µg/L	Discharge Conc < TQL
Phenanthrene	1.46	µg/L	Discharge Conc < TQL
Pyrene	29.2	µg/L	Discharge Conc < TQL
1,2,4-Trichlorobenzene	0.1	µg/L	Discharge Conc < TQL

5. Toxics Management Spreadsheet (4.95 MGD)

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Toxics Management Spreadsheet
Version 1.3, March 2021

Discharge Information

Instructions | Discharge | Stream

Facility: **Shippensburg STP** NPDES Permit No.: **PA0030643** Outfall No.: **001**

Evaluation Type: **Major Sewage / Industrial Waste** Wastewater Description: **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
4.95	140	7						

					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		554									
	Chloride (PWS)	mg/L		10.1									
	Bromide	mg/L		0.25									
	Sulfate (PWS)	mg/L		5									
	Fluoride (PWS)	mg/L											
Group 2	Total Aluminum	µg/L		150									
	Total Antimony	µg/L	<	1									
	Total Arsenic	µg/L	<	1.5									
	Total Barium	µg/L	<	50									
	Total Beryllium	µg/L	<	0.5									
	Total Boron	µg/L		120									
	Total Cadmium	µg/L	<	0.2									
	Total Chromium (III)	µg/L	<	1									
	Hexavalent Chromium	µg/L	<	1									
	Total Cobalt	µg/L	<	1									
	Total Copper	µg/L		7.2									
	Free Cyanide	µg/L	<	1									
	Total Cyanide	µg/L	<	5									
	Dissolved Iron	µg/L		90									
	Total Iron	µg/L		220									
	Total Lead	µg/L	<	1									
	Total Manganese	µg/L	<	20									
	Total Mercury	µg/L	<	0.2									
	Total Nickel	µg/L		2.7									
	Total Phenols (Phenolics) (PWS)	µg/L	<	5									
	Total Selenium	µg/L	<	2									
	Total Silver	µg/L	<	0.5									
	Total Thallium	µg/L	<	0.5									
	Total Zinc	µg/L		58									
	Total Molybdenum	µg/L		3.1									
	Acrolein	µg/L	<	2									
	Acrylamide	µg/L	<										
	Acrylonitrile	µg/L	<	5									
	Benzene	µg/L	<	0.5									
	Bromoform	µg/L	<	1									

Group 3	Carbon Tetrachloride	µg/L	<	0.5									
	Chlorobenzene	µg/L		1									
	Chlorodibromomethane	µg/L	<	0.5									
	Chloroethane	µg/L	<	1									
	2-Chloroethyl Vinyl Ether	µg/L	<	2									
	Chloroform	µg/L	<	1									
	Dichlorobromomethane	µg/L	<	0.5									
	1,1-Dichloroethane	µg/L	<	1									
	1,2-Dichloroethane	µg/L	<	1									
	1,1-Dichloroethylene	µg/L	<	1									
	1,2-Dichloropropane	µg/L	<	0.5									
	1,3-Dichloropropylene	µg/L	<	0.5									
	1,4-Dioxane	µg/L	<	1									
	Ethylbenzene	µg/L	<	1									
	Methyl Bromide	µg/L	<	1									
	Methyl Chloride	µg/L	<	1									
	Methylene Chloride	µg/L	<	1									
	1,1,2,2-Tetrachloroethane	µg/L	<	0.5									
	Tetrachloroethylene	µg/L	<	1									
	Toluene	µg/L	<	1									
	1,2-trans-Dichloroethylene	µg/L	<	1									
	1,1,1-Trichloroethane	µg/L	<	1									
	1,1,2-Trichloroethane	µg/L	<	0.5									
	Trichloroethylene	µg/L	<	0.5									
	Vinyl Chloride	µg/L	<	0.5									
Group 4	2-Chlorophenol	µg/L	<	2.8									
	2,4-Dichlorophenol	µg/L	<	2.8									
	2,4-Dimethylphenol	µg/L	<	2.8									
	4,6-Dinitro-o-Cresol	µg/L	<	2.8									
	2,4-Dinitrophenol	µg/L	<	5.6									
	2-Nitrophenol	µg/L	<	2.8									
	4-Nitrophenol	µg/L	<	2.8									
	p-Chloro-m-Cresol	µg/L	<	2.8									
	Pentachlorophenol	µg/L	<	5.6									
	Phenol	µg/L	<	7.4									
	2,4,6-Trichlorophenol	µg/L	<	2.8									
Group 5	Acenaphthene	µg/L	<	1.4									
	Acenaphthylene	µg/L	<	1.4									
	Anthracene	µg/L	<	1.4									
	Benzidine	µg/L	<	7.4									
	Benzo(a)Anthracene	µg/L	<	1.4									
	Benzo(a)Pyrene	µg/L	<	1.4									
	3,4-Benzofluoranthene	µg/L	<	1.4									
	Benzo(ghi)Perylene	µg/L	<	1.4									
	Benzo(k)Fluoranthene	µg/L	<	1.4									
	Bis(2-Chloroethoxy)Methane	µg/L	<	2.8									
	Bis(2-Chloroethyl)Ether	µg/L	<	2.8									
	Bis(2-Chloroisopropyl)Ether	µg/L	<	2.8									
	Bis(2-Ethylhexyl)Phthalate	µg/L	<	3									
	4-Bromophenyl Phenyl Ether	µg/L	<	2.8									
	Butyl Benzyl Phthalate	µg/L	<	2.8									
	2-Chloronaphthalene	µg/L	<	2.8									
	4-Chlorophenyl Phenyl Ether	µg/L	<	2.8									
	Chrysene	µg/L	<	1.4									
	Dibenzo(a,h)Anthrancene	µg/L	<	1.4									
	1,2-Dichlorobenzene	µg/L	<	1.4									
	1,3-Dichlorobenzene	µg/L	<	1.4									
	1,4-Dichlorobenzene	µg/L	<	2.8									
	3,3-Dichlorobenzidine	µg/L	<	2.8									
	Diethyl Phthalate	µg/L	<	2.8									
	Dimethyl Phthalate	µg/L	<	2.8									
	Di-n-Butyl Phthalate	µg/L	<	2.8									
	2,4-Dinitrotoluene	µg/L	<	2.8									

	2,6-Dinitrotoluene	µg/L	<	2.8									
	Di-n-Octyl Phthalate	µg/L	<	2.8									
	1,2-Diphenylhydrazine	µg/L	<	2.8									
	Fluoranthene	µg/L	<	1.4									
	Fluorene	µg/L	<	1.4									
	Hexachlorobenzene	µg/L	<	2.8									
	Hexachlorobutadiene	µg/L	<	0.5									
	Hexachlorocyclopentadiene	µg/L	<	2.8									
	Hexachloroethane	µg/L	<	2.8									
	Indeno(1,2,3-cd)Pyrene	µg/L	<	1.4									
	Isophorone	µg/L	<	2.8									
	Naphthalene	µg/L	<	1.4									
	Nitrobenzene	µg/L	<	2.8									
	n-Nitrosodimethylamine	µg/L	<	2.8									
	n-Nitrosodi-n-Propylamine	µg/L	<	2.8									
	n-Nitrosodiphenylamine	µg/L	<	2.8									
	Phenanthrene	µg/L	<	1.4									
	Pyrene	µg/L	<	1.4									
	1,2,4-Trichlorobenzene	µg/L	<	0.5									
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											

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DEPARTMENT OF ENVIRONMENTAL PROTECTION

Toxics Management Spreadsheet
Version 1.3, March 2021

Stream / Surface Water Information

Shippensburg STP, NPDES Permit No. PA0030643, Outfall 001

Instructions | Discharge | *Stream*

Receiving Surface Water Name: **Middle Spring Creek**

No. Reaches to Model: 1

- (•) Statewide Criteria
- ( ) Great Lakes Criteria
- ( ) ORSANCO Criteria

Location	Stream Code*	RMI*	Elevation (ft)*	DA (mi^2)*	Slope (ft/ft)	PWS Withdrawal (MGD)	Apply Fish Criteria*
Point of Discharge	010602	5.43	620	20.6			Yes
End of Reach 1	010602	4.22	594	41.3			Yes

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

Location	RMI	LFY (cfs/mi^2)*	Flow (cfs)		W/D Ratio	Width (ft)	Depth (ft)	Velocity (fps)	Travel Time (days)	Tributary		Stream		Analysis	
			Stream	Tributary						Hardness	pH	Hardness*	pH*	Hardness	pH
Point of Discharge	5.43	0.149										100	7		
End of Reach 1	4.22	0.149													

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	5.43														
End of Reach 1	4.22														

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Toxics Management Spreadsheet
Version 1.3, March 2021

Model Results

Shippensburg STP, NPDES Permit No. PA0030643, Outfall 001

Instructions | Results | RETURN TO INPUTS | SAVE AS PDF | PRINT | (●) All ( ) Inputs ( ) Results ( ) Limits

☑ ***Hydrodynamics***

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

RMI	Stream Flow (cfs)	PWS Withdrawal (cfs)	Net Stream Flow (cfs)	Discharge Analysis Flow (cfs)	Slope (ft/ft)	Depth (ft)	Width (ft)	W/D Ratio	Velocity (fps)	Travel Time (days)	Complete Mix Time (min)
5.43	3.07		3.07	7.658	0.004	0.716	37.388	52.238	0.401	0.184	4.061
4.22	6.15		6.1537								

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)
5.43	19.80		19.80	7.658	0.004	1.082	37.388	34.545	0.679	0.109	13.871
4.22	36.366		36.37								

☑ ***Wasteload Allocations***

☑ ***AFC*** CCT (min): 4.061 PMF: 1 Analysis Hardness (mg/l): 128.55 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	750	750	1,051	
Total Antimony	0	0		0	1,100	1,100	1,541	
Total Arsenic	0	0		0	340	340	476	Chem Translator of 1 applied
Total Barium	0	0		0	21,000	21,000	29,417	
Total Boron	0	0		0	8,100	8,100	11,347	
Total Cadmium	0	0		0	2.571	2.75	3.86	Chem Translator of 0.933 applied
Total Chromium (III)	0	0		0	699.902	2,215	3,103	Chem Translator of 0.316 applied
Hexavalent Chromium	0	0		0	16	16.3	22.8	Chem Translator of 0.982 applied
Total Cobalt	0	0		0	95	95.0	133	
Total Copper	0	0		0	17.028	17.7	24.8	Chem Translator of 0.96 applied
Free Cyanide	0	0		0	22	22.0	30.8	

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	84.801	112	157	Chem Translator of 0.754 applied
Total Manganese	0	0		0	N/A	N/A	N/A	
Total Mercury	0	0		0	1.400	1.65	2.31	Chem Translator of 0.85 applied
Total Nickel	0	0		0	579.099	580	813	Chem Translator of 0.998 applied
Total Phenols (Phenolics) (PWS)	0	0		0	N/A	N/A	N/A	
Total Selenium	0	0		0	N/A	N/A	N/A	Chem Translator of 0.922 applied
Total Silver	0	0		0	4.955	5.83	8.17	Chem Translator of 0.85 applied
Total Thallium	0	0		0	65	65.0	91.1	
Total Zinc	0	0		0	144.972	148	208	Chem Translator of 0.978 applied
Acrolein	0	0		0	3	3.0	4.2	
Acrylonitrile	0	0		0	650	650	911	
Benzene	0	0		0	640	640	897	
Bromoform	0	0		0	1,800	1,800	2,521	
Carbon Tetrachloride	0	0		0	2,800	2,800	3,922	
Chlorobenzene	0	0		0	1,200	1,200	1,681	
Chlorodibromomethane	0	0		0	N/A	N/A	N/A	
2-Chloroethyl Vinyl Ether	0	0		0	18,000	18,000	25,215	
Chloroform	0	0		0	1,900	1,900	2,662	
Dichlorobromomethane	0	0		0	N/A	N/A	N/A	
1,2-Dichloroethane	0	0		0	15,000	15,000	21,012	
1,1-Dichloroethylene	0	0		0	7,500	7,500	10,506	
1,2-Dichloropropane	0	0		0	11,000	11,000	15,409	
1,3-Dichloropropylene	0	0		0	310	310	434	
Ethylbenzene	0	0		0	2,900	2,900	4,062	
Methyl Bromide	0	0		0	550	550	770	
Methyl Chloride	0	0		0	28,000	28,000	39,223	
Methylene Chloride	0	0		0	12,000	12,000	16,810	
1,1,2,2-Tetrachloroethane	0	0		0	1,000	1,000	1,401	
Tetrachloroethylene	0	0		0	700	700	981	
Toluene	0	0		0	1,700	1,700	2,381	
1,2-trans-Dichloroethylene	0	0		0	6,800	6,800	9,526	
1,1,1-Trichloroethane	0	0		0	3,000	3,000	4,202	
1,1,2-Trichloroethane	0	0		0	3,400	3,400	4,763	
Trichloroethylene	0	0		0	2,300	2,300	3,222	
Vinyl Chloride	0	0		0	N/A	N/A	N/A	
2-Chlorophenol	0	0		0	560	560	784	
2,4-Dichlorophenol	0	0		0	1,700	1,700	2,381	
2,4-Dimethylphenol	0	0		0	660	660	925	
4,6-Dinitro-o-Cresol	0	0		0	80	80.0	112	
2,4-Dinitrophenol	0	0		0	660	660	925	
2-Nitrophenol	0	0		0	8,000	8,000	11,207	
4-Nitrophenol	0	0		0	2,300	2,300	3,222	
p-Chloro-m-Cresol	0	0		0	160	160	224	
Pentachlorophenol	0	0		0	8.723	8.72	12.2	
Phenol	0	0		0	N/A	N/A	N/A	
2,4,6-Trichlorophenol	0	0		0	460	460	644	

Acenaphthene	0	0		0	83	83.0	116	
Anthracene	0	0		0	N/A	N/A	N/A	
Benzidine	0	0		0	300	300	420	
Benzo(a)Anthracene	0	0		0	0.5	0.5	0.7	
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	42,025	
Bis(2-Chloroisopropyl)Ether	0	0		0	N/A	N/A	N/A	
Bis(2-Ethylhexyl)Phthalate	0	0		0	4,500	4,500	6,304	
4-Bromophenyl Phenyl Ether	0	0		0	270	270	378	
Butyl Benzyl Phthalate	0	0		0	140	140	196	
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	1,149	
1,3-Dichlorobenzene	0	0		0	350	350	490	
1,4-Dichlorobenzene	0	0		0	730	730	1,023	
3,3-Dichlorobenzidine	0	0		0	N/A	N/A	N/A	
Diethyl Phthalate	0	0		0	4,000	4,000	5,603	
Dimethyl Phthalate	0	0		0	2,500	2,500	3,502	
Di-n-Butyl Phthalate	0	0		0	110	110	154	
2,4-Dinitrotoluene	0	0		0	1,600	1,600	2,241	
2,6-Dinitrotoluene	0	0		0	990	990	1,387	
1,2-Diphenylhydrazine	0	0		0	15	15.0	21.0	
Fluoranthene	0	0		0	200	200	280	
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	14.0	
Hexachlorocyclopentadiene	0	0		0	5	5.0	7.0	
Hexachloroethane	0	0		0	60	60.0	84.0	
Indeno(1,2,3-cd)Pyrene	0	0		0	N/A	N/A	N/A	
Isophorone	0	0		0	10,000	10,000	14,008	
Naphthalene	0	0		0	140	140	196	
Nitrobenzene	0	0		0	4,000	4,000	5,603	
n-Nitrosodimethylamine	0	0		0	17,000	17,000	23,814	
n-Nitrosodi-n-Propylamine	0	0		0	N/A	N/A	N/A	
n-Nitrosodiphenylamine	0	0		0	300	300	420	
Phenanthrene	0	0		0	5	5.0	7.0	
Pyrene	0	0		0	N/A	N/A	N/A	
1,2,4-Trichlorobenzene	0	0		0	130	130	182	

☑ ***CFC*** CCT (min): 4.061 PMF: 1 Analysis Hardness (mg/l): 128.55 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	308	
Total Arsenic	0	0		0	150	150	210	Chem Translator of 1 applied
Total Barium	0	0		0	4,100	4,100	5,743	
Total Boron	0	0		0	1,600	1,600	2,241	
Total Cadmium	0	0		0	0.293	0.33	0.46	Chem Translator of 0.898 applied
Total Chromium (III)	0	0		0	91.043	106	148	Chem Translator of 0.86 applied
Hexavalent Chromium	0	0		0	10	10.4	14.6	Chem Translator of 0.962 applied
Total Cobalt	0	0		0	19	19.0	26.6	
Total Copper	0	0		0	11.100	11.6	16.2	Chem Translator of 0.96 applied
Free Cyanide	0	0		0	5.2	5.2	7.28	
Dissolved Iron	0	0		0	N/A	N/A	N/A	
Total Iron	0	0		0	1,500	1,500	2,101	WQC = 30 day average; PMF = 1
Total Lead	0	0		0	3.305	4.38	6.14	Chem Translator of 0.754 applied
Total Manganese	0	0		0	N/A	N/A	N/A	
Total Mercury	0	0		0	0.770	0.91	1.27	Chem Translator of 0.85 applied
Total Nickel	0	0		0	64.320	64.5	90.4	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	6.99	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	18.2	
Total Zinc	0	0		0	146.158	148	208	Chem Translator of 0.986 applied
Acrolein	0	0		0	3	3.0	4.2	
Acrylonitrile	0	0		0	130	130	182	
Benzene	0	0		0	130	130	182	
Bromoform	0	0		0	370	370	518	
Carbon Tetrachloride	0	0		0	560	560	784	
Chlorobenzene	0	0		0	240	240	336	
Chlorodibromomethane	0	0		0	N/A	N/A	N/A	
2-Chloroethyl Vinyl Ether	0	0		0	3,500	3,500	4,903	
Chloroform	0	0		0	390	390	546	
Dichlorobromomethane	0	0		0	N/A	N/A	N/A	
1,2-Dichloroethane	0	0		0	3,100	3,100	4,343	
1,1-Dichloroethylene	0	0		0	1,500	1,500	2,101	
1,2-Dichloropropane	0	0		0	2,200	2,200	3,082	
1,3-Dichloropropylene	0	0		0	61	61.0	85.5	
Ethylbenzene	0	0		0	580	580	812	
Methyl Bromide	0	0		0	110	110	154	
Methyl Chloride	0	0		0	5,500	5,500	7,705	
Methylene Chloride	0	0		0	2,400	2,400	3,362	
1,1,2,2-Tetrachloroethane	0	0		0	210	210	294	
Tetrachloroethylene	0	0		0	140	140	196	
Toluene	0	0		0	330	330	462	

1,2-trans-Dichloroethylene	0	0		0	1,400	1,400	1,961	
1,1,1-Trichloroethane	0	0		0	610	610	855	
1,1,2-Trichloroethane	0	0		0	680	680	953	
Trichloroethylene	0	0		0	450	450	630	
Vinyl Chloride	0	0		0	N/A	N/A	N/A	
2-Chlorophenol	0	0		0	110	110	154	
2,4-Dichlorophenol	0	0		0	340	340	476	
2,4-Dimethylphenol	0	0		0	130	130	182	
4,6-Dinitro-o-Cresol	0	0		0	16	16.0	22.4	
2,4-Dinitrophenol	0	0		0	130	130	182	
2-Nitrophenol	0	0		0	1,600	1,600	2,241	
4-Nitrophenol	0	0		0	470	470	658	
p-Chloro-m-Cresol	0	0		0	500	500	700	
Pentachlorophenol	0	0		0	6.693	6.69	9.38	
Phenol	0	0		0	N/A	N/A	N/A	
2,4,6-Trichlorophenol	0	0		0	91	91.0	127	
Acenaphthene	0	0		0	17	17.0	23.8	
Anthracene	0	0		0	N/A	N/A	N/A	
Benzidine	0	0		0	59	59.0	82.6	
Benzo(a)Anthracene	0	0		0	0.1	0.1	0.14	
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	8,405	
Bis(2-Chloroisopropyl)Ether	0	0		0	N/A	N/A	N/A	
Bis(2-Ethylhexyl)Phthalate	0	0		0	910	910	1,275	
4-Bromophenyl Phenyl Ether	0	0		0	54	54.0	75.6	
Butyl Benzyl Phthalate	0	0		0	35	35.0	49.0	
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	224	
1,3-Dichlorobenzene	0	0		0	69	69.0	96.7	
1,4-Dichlorobenzene	0	0		0	150	150	210	
3,3-Dichlorobenzidine	0	0		0	N/A	N/A	N/A	
Diethyl Phthalate	0	0		0	800	800	1,121	
Dimethyl Phthalate	0	0		0	500	500	700	
Di-n-Butyl Phthalate	0	0		0	21	21.0	29.4	
2,4-Dinitrotoluene	0	0		0	320	320	448	
2,6-Dinitrotoluene	0	0		0	200	200	280	
1,2-Diphenylhydrazine	0	0		0	3	3.0	4.2	
Fluoranthene	0	0		0	40	40.0	56.0	
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	2.8	

Hexachlorocyclopentadiene	0	0		0	1	1.0	1.4	
Hexachloroethane	0	0		0	12	12.0	16.8	
Indeno(1,2,3-cd)Pyrene	0	0		0	N/A	N/A	N/A	
Isophorone	0	0		0	2,100	2,100	2,942	
Naphthalene	0	0		0	43	43.0	60.2	
Nitrobenzene	0	0		0	810	810	1,135	
n-Nitrosodimethylamine	0	0		0	3,400	3,400	4,763	
n-Nitrosodi-n-Propylamine	0	0		0	N/A	N/A	N/A	
n-Nitrosodiphenylamine	0	0		0	59	59.0	82.6	
Phenanthrene	0	0		0	1	1.0	1.4	
Pyrene	0	0		0	N/A	N/A	N/A	
1,2,4-Trichlorobenzene	0	0		0	26	26.0	36.4	

☑ ***THH*** CCT (min): 4.061 PMF: 1 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	7.84	
Total Arsenic	0	0		0	10	10.0	14.0	
Total Barium	0	0		0	2,400	2,400	3,362	
Total Boron	0	0		0	3,100	3,100	4,343	
Total Cadmium	0	0		0	N/A	N/A	N/A	
Total Chromium (III)	0	0		0	N/A	N/A	N/A	
Hexavalent Chromium	0	0		0	N/A	N/A	N/A	
Total Cobalt	0	0		0	N/A	N/A	N/A	
Total Copper	0	0		0	N/A	N/A	N/A	
Free Cyanide	0	0		0	4	4.0	5.6	
Dissolved Iron	0	0		0	300	300	420	
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	1,401	
Total Mercury	0	0		0	0.050	0.05	0.07	
Total Nickel	0	0		0	610	610	855	
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	0.34	
Total Zinc	0	0		0	N/A	N/A	N/A	
Acrolein	0	0		0	3	3.0	4.2	
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	140	
Chlorodibromomethane	0	0		0	N/A	N/A	N/A	
2-Chloroethyl Vinyl Ether	0	0		0	N/A	N/A	N/A	
Chloroform	0	0		0	N/A	N/A	N/A	
Dichlorobromomethane	0	0		0	N/A	N/A	N/A	
1,2-Dichloroethane	0	0		0	N/A	N/A	N/A	
1,1-Dichloroethylene	0	0		0	33	33.0	46.2	
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	95.3	
Methyl Bromide	0	0		0	100	100.0	140	
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	79.8	
1,2-trans-Dichloroethylene	0	0		0	100	100.0	140	
1,1,1-Trichloroethane	0	0		0	10,000	10,000	14,008	
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	42.0	
2,4-Dichlorophenol	0	0		0	10	10.0	14.0	
2,4-Dimethylphenol	0	0		0	100	100.0	140	
4,6-Dinitro-o-Cresol	0	0		0	2	2.0	2.8	
2,4-Dinitrophenol	0	0		0	10	10.0	14.0	
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	5,603	
2,4,6-Trichlorophenol	0	0		0	N/A	N/A	N/A	
Acenaphthene	0	0		0	70	70.0	98.1	
Anthracene	0	0		0	300	300	420	
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	280	
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	0.14	
2-Chloronaphthalene	0	0		0	800	800	1,121	
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	1,401	
1,3-Dichlorobenzene	0	0		0	7	7.0	9.81	
1,4-Dichlorobenzene	0	0		0	300	300	420	
3,3-Dichlorobenzidine	0	0		0	N/A	N/A	N/A	
Diethyl Phthalate	0	0		0	600	600	840	
Dimethyl Phthalate	0	0		0	2,000	2,000	2,802	
Di-n-Butyl Phthalate	0	0		0	20	20.0	28.0	
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	28.0	
Fluorene	0	0		0	50	50.0	70.0	
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	5.6	
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	47.6	
Naphthalene	0	0		0	N/A	N/A	N/A	
Nitrobenzene	0	0		0	10	10.0	14.0	
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	28.0	
1,2,4-Trichlorobenzene	0	0		0	0.07	0.07	0.098	

☑ ***CRL*** CCT (min): 13.871 PMF: 1 Analysis Hardness (mg/l): N/A Analysis pH: N/A

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

Hexavalent Chromium	0	0		0	N/A	N/A	N/A	
Total Cobalt	0	0		0	N/A	N/A	N/A	
Total Copper	0	0		0	N/A	N/A	N/A	
Free Cyanide	0	0		0	N/A	N/A	N/A	
Dissolved Iron	0	0		0	N/A	N/A	N/A	
Total Iron	0	0		0	N/A	N/A	N/A	
Total Lead	0	0		0	N/A	N/A	N/A	
Total Manganese	0	0		0	N/A	N/A	N/A	
Total Mercury	0	0		0	N/A	N/A	N/A	
Total Nickel	0	0		0	N/A	N/A	N/A	
Total Phenols (Phenolics) (PWS)	0	0		0	N/A	N/A	N/A	
Total Selenium	0	0		0	N/A	N/A	N/A	
Total Silver	0	0		0	N/A	N/A	N/A	
Total Thallium	0	0		0	N/A	N/A	N/A	
Total Zinc	0	0		0	N/A	N/A	N/A	
Acrolein	0	0		0	N/A	N/A	N/A	
Acrylonitrile	0	0		0	0.06	0.06	0.22	
Benzene	0	0		0	0.58	0.58	2.08	
Bromoform	0	0		0	7	7.0	25.1	
Carbon Tetrachloride	0	0		0	0.4	0.4	1.43	
Chlorobenzene	0	0		0	N/A	N/A	N/A	
Chlorodibromomethane	0	0		0	0.8	0.8	2.87	
2-Chloroethyl Vinyl Ether	0	0		0	N/A	N/A	N/A	
Chloroform	0	0		0	5.7	5.7	20.4	
Dichlorobromomethane	0	0		0	0.95	0.95	3.41	
1,2-Dichloroethane	0	0		0	9.9	9.9	35.5	
1,1-Dichloroethylene	0	0		0	N/A	N/A	N/A	
1,2-Dichloropropane	0	0		0	0.9	0.9	3.23	
1,3-Dichloropropylene	0	0		0	0.27	0.27	0.97	
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	71.7	
1,1,2,2-Tetrachloroethane	0	0		0	0.2	0.2	0.72	
Tetrachloroethylene	0	0		0	10	10.0	35.9	
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	1.97	
Trichloroethylene	0	0		0	0.6	0.6	2.15	
Vinyl Chloride	0	0		0	0.02	0.02	0.072	
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	0.11	
Phenol	0	0		0	N/A	N/A	N/A	
2,4,6-Trichlorophenol	0	0		0	1.5	1.5	5.38	
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	0.0004	
Benzo(a)Anthracene	0	0		0	0.001	0.001	0.004	
Benzo(a)Pyrene	0	0		0	0.0001	0.0001	0.0004	
3,4-Benzofluoranthene	0	0		0	0.001	0.001	0.004	
Benzo(k)Fluoranthene	0	0		0	0.01	0.01	0.036	
Bis(2-Chloroethyl)Ether	0	0		0	0.03	0.03	0.11	
Bis(2-Chloroisopropyl)Ether	0	0		0	N/A	N/A	N/A	
Bis(2-Ethylhexyl)Phthalate	0	0		0	0.32	0.32	1.15	
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	0.43	
Dibenzo(a,h)Anthrancene	0	0		0	0.0001	0.0001	0.0004	
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	0.18	
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	0.18	
2,6-Dinitrotoluene	0	0		0	0.05	0.05	0.18	
1,2-Diphenylhydrazine	0	0		0	0.03	0.03	0.11	
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	0.0003	
Hexachlorobutadiene	0	0		0	0.01	0.01	0.036	
Hexachlorocyclopentadiene	0	0		0	N/A	N/A	N/A	
Hexachloroethane	0	0		0	0.1	0.1	0.36	
Indeno(1,2,3-cd)Pyrene	0	0		0	0.001	0.001	0.004	
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	0.003	
n-Nitrosodi-n-Propylamine	0	0		0	0.005	0.005	0.018	
n-Nitrosodiphenylamine	0	0		0	3.3	3.3	11.8	

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

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

No. Samples/Month: 4

	Mass Limits		*Concentration Limits*						
Pollutants	AML (lbs/day)	MDL (lbs/day)	AML	MDL	IMAX	Units	Governing WQBEL	WQBEL Basis	Comments
Total Aluminum	Report	Report	Report	Report	Report	µg/L	750	AFC	Discharge Conc > 10% WQBEL (no RP)
Total Copper	Report	Report	Report	Report	Report	µg/L	16.2	CFC	Discharge Conc > 10% WQBEL (no RP)
Dissolved Iron	Report	Report	Report	Report	Report	µg/L	420	THH	Discharge Conc > 10% WQBEL (no RP)
Total Iron	Report	Report	Report	Report	Report	µg/L	2,101	CFC	Discharge Conc > 10% WQBEL (no RP)
Total Zinc	Report	Report	Report	Report	Report	µg/L	148	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 Antimony	N/A	N/A	Discharge Conc < TQL

Total Arsenic	N/A	N/A	Discharge Conc < TQL
Total Barium	3,362	µg/L	Discharge Conc ≤ 10% WQBEL
Total Beryllium	N/A	N/A	No WQS
Total Boron	2,241	µg/L	Discharge Conc ≤ 10% WQBEL
Total Cadmium	0.46	µg/L	Discharge Conc < TQL
Total Chromium (III)	148	µg/L	Discharge Conc < TQL
Hexavalent Chromium	14.6	µg/L	Discharge Conc < TQL
Total Cobalt	26.6	µg/L	Discharge Conc < TQL
Free Cyanide	5.6	µg/L	Discharge Conc < TQL
Total Cyanide	N/A	N/A	No WQS
Total Lead	6.14	µg/L	Discharge Conc < TQL
Total Manganese	1,401	µg/L	Discharge Conc ≤ 10% WQBEL
Total Mercury	0.07	µg/L	Discharge Conc < TQL
Total Nickel	90.4	µg/L	Discharge Conc ≤ 10% WQBEL
Total Phenols (Phenolics) (PWS)		µg/L	Discharge Conc < TQL
Total Selenium	6.99	µg/L	Discharge Conc < TQL
Total Silver	5.83	µg/L	Discharge Conc ≤ 10% WQBEL
Total Thallium	0.34	µg/L	Discharge Conc < TQL
Total Molybdenum	N/A	N/A	No WQS
Acrolein	3.0	µg/L	Discharge Conc < TQL
Acrylonitrile	0.22	µg/L	Discharge Conc < TQL
Benzene	2.08	µg/L	Discharge Conc < TQL
Bromoform	25.1	µg/L	Discharge Conc ≤ 25% WQBEL
Carbon Tetrachloride	1.43	µg/L	Discharge Conc < TQL
Chlorobenzene	140	µg/L	Discharge Conc ≤ 25% WQBEL
Chlorodibromomethane	2.87	µg/L	Discharge Conc < TQL
Chloroethane	N/A	N/A	No WQS
2-Chloroethyl Vinyl Ether	4,903	µg/L	Discharge Conc < TQL
Chloroform	20.4	µg/L	Discharge Conc ≤ 25% WQBEL
Dichlorobromomethane	3.41	µg/L	Discharge Conc < TQL
1,1-Dichloroethane	N/A	N/A	No WQS
1,2-Dichloroethane	35.5	µg/L	Discharge Conc ≤ 25% WQBEL
1,1-Dichloroethylene	46.2	µg/L	Discharge Conc ≤ 25% WQBEL
1,2-Dichloropropane	3.23	µg/L	Discharge Conc < TQL
1,3-Dichloropropylene	0.97	µg/L	Discharge Conc < TQL
1,4-Dioxane	N/A	N/A	No WQS
Ethylbenzene	95.3	µg/L	Discharge Conc ≤ 25% WQBEL
Methyl Bromide	140	µg/L	Discharge Conc ≤ 25% WQBEL
Methyl Chloride	7,705	µg/L	Discharge Conc ≤ 25% WQBEL
Methylene Chloride	71.7	µg/L	Discharge Conc ≤ 25% WQBEL
1,1,2,2-Tetrachloroethane	0.72	µg/L	Discharge Conc < TQL
Tetrachloroethylene	35.9	µg/L	Discharge Conc ≤ 25% WQBEL
Toluene	79.8	µg/L	Discharge Conc ≤ 25% WQBEL
1,2-trans-Dichloroethylene	140	µg/L	Discharge Conc ≤ 25% WQBEL
1,1,1-Trichloroethane	855	µg/L	Discharge Conc ≤ 25% WQBEL

1,1,2-Trichloroethane	1.97	µg/L	Discharge Conc < TQL
Trichloroethylene	2.15	µg/L	Discharge Conc < TQL
Vinyl Chloride	0.072	µg/L	Discharge Conc < TQL
2-Chlorophenol	42.0	µg/L	Discharge Conc < TQL
2,4-Dichlorophenol	14.0	µg/L	Discharge Conc < TQL
2,4-Dimethylphenol	140	µg/L	Discharge Conc < TQL
4,6-Dinitro-o-Cresol	2.8	µg/L	Discharge Conc < TQL
2,4-Dinitrophenol	14.0	µg/L	Discharge Conc < TQL
2-Nitrophenol	2,241	µg/L	Discharge Conc < TQL
4-Nitrophenol	658	µg/L	Discharge Conc < TQL
p-Chloro-m-Cresol	160	µg/L	Discharge Conc < TQL
Pentachlorophenol	0.11	µg/L	Discharge Conc < TQL
Phenol	5,603	µg/L	Discharge Conc < TQL
2,4,6-Trichlorophenol	5.38	µg/L	Discharge Conc < TQL
Acenaphthene	23.8	µg/L	Discharge Conc < TQL
Acenaphthylene	N/A	N/A	No WQS
Anthracene	420	µg/L	Discharge Conc < TQL
Benzidine	0.0004	µg/L	Discharge Conc < TQL
Benzo(a)Anthracene	0.004	µg/L	Discharge Conc < TQL
Benzo(a)Pyrene	0.0004	µg/L	Discharge Conc < TQL
3,4-Benzofluoranthene	0.004	µg/L	Discharge Conc < TQL
Benzo(ghi)Perylene	N/A	N/A	No WQS
Benzo(k)Fluoranthene	0.036	µg/L	Discharge Conc < TQL
Bis(2-Chloroethoxy)Methane	N/A	N/A	No WQS
Bis(2-Chloroethyl)Ether	0.11	µg/L	Discharge Conc < TQL
Bis(2-Chloroisopropyl)Ether	280	µg/L	Discharge Conc < TQL
Bis(2-Ethylhexyl)Phthalate	1.15	µg/L	Discharge Conc < TQL
4-Bromophenyl Phenyl Ether	75.6	µg/L	Discharge Conc < TQL
Butyl Benzyl Phthalate	0.14	µg/L	Discharge Conc < TQL
2-Chloronaphthalene	1,121	µg/L	Discharge Conc < TQL
4-Chlorophenyl Phenyl Ether	N/A	N/A	No WQS
Chrysene	0.43	µg/L	Discharge Conc < TQL
Dibenzo(a,h)Anthrancene	0.0004	µg/L	Discharge Conc < TQL
1,2-Dichlorobenzene	224	µg/L	Discharge Conc ≤ 25% WQBEL
1,3-Dichlorobenzene	9.81	µg/L	Discharge Conc ≤ 25% WQBEL
1,4-Dichlorobenzene	210	µg/L	Discharge Conc ≤ 25% WQBEL
3,3-Dichlorobenzidine	0.18	µg/L	Discharge Conc < TQL
Diethyl Phthalate	840	µg/L	Discharge Conc < TQL
Dimethyl Phthalate	700	µg/L	Discharge Conc < TQL
Di-n-Butyl Phthalate	28.0	µg/L	Discharge Conc < TQL
2,4-Dinitrotoluene	0.18	µg/L	Discharge Conc < TQL
2,6-Dinitrotoluene	0.18	µg/L	Discharge Conc < TQL
Di-n-Octyl Phthalate	N/A	N/A	No WQS
1,2-Diphenylhydrazine	0.11	µg/L	Discharge Conc < TQL
Fluoranthene	28.0	µg/L	Discharge Conc < TQL

Fluorene	70.0	µg/L	Discharge Conc < TQL
Hexachlorobenzene	0.0003	µg/L	Discharge Conc < TQL
Hexachlorobutadiene	0.036	µg/L	Discharge Conc < TQL
Hexachlorocyclopentadiene	1.4	µg/L	Discharge Conc < TQL
Hexachloroethane	0.36	µg/L	Discharge Conc < TQL
Indeno(1,2,3-cd)Pyrene	0.004	µg/L	Discharge Conc < TQL
Isophorone	47.6	µg/L	Discharge Conc < TQL
Naphthalene	60.2	µg/L	Discharge Conc ≤ 25% WQBEL
Nitrobenzene	14.0	µg/L	Discharge Conc < TQL
n-Nitrosodimethylamine	0.003	µg/L	Discharge Conc < TQL
n-Nitrosodi-n-Propylamine	0.018	µg/L	Discharge Conc < TQL
n-Nitrosodiphenylamine	11.8	µg/L	Discharge Conc < TQL
Phenanthrene	1.4	µg/L	Discharge Conc < TQL
Pyrene	28.0	µg/L	Discharge Conc < TQL
1,2,4-Trichlorobenzene	0.098	µg/L	Discharge Conc < TQL

6. Whole Effluent Toxicity (WET) Analysis Spreadsheet

DEP Whole Effluent Toxicity (WET) Analysis Spreadsheet

Type of Test	Chronic
Species Tested	Ceriodaphnia
Endpoint	Reproduction
TIWC (decimal)	0.68
No. Per Replicate	1
TST b value	0.75
TST alpha value	0.2

Facility Name: Shippensburg WWTP

Permit No.: PA0030643

Replicate No.	Test Completion Date: 5/17/2021 Control	TIWC
1	38	33
2	38	36
3	34	36
4	32	42
5	25	16
6	28	18
7	19	28
8	28	37
9	33	34
10	34	32
11		
12		
13		
14		
15		
Mean	30.900	31.200
Std Dev.	5.953	8.324
# Replicates	10	10
T-Test Result	2.6867	
Deg. of Freedom	15	
Critical T Value	0.8662	
Pass or Fail	PASS	

Replicate No.	Test Completion Date: 8/2/2021 Control	TIWC
1	21	30
2	23	27
3	26	29
4	22	27
5	26	29
6	22	14
7	21	33
8	22	25
9	20	16
10	24	23
11		
12		
13		
14		
15		
Mean	22.700	25.300
Std Dev.	2.058	6.093
# Replicates	10	10
T-Test Result	4.1634	
Deg. of Freedom	12	
Critical T Value	0.8726	
Pass or Fail	PASS	

Replicate No.	Test Completion Date: 10/18/2021 Control	TIWC
1	31	29
2	32	27
3	29	33
4	28	29
5	31	27
6	26	25
7	25	21
8	24	30
9	24	28
10	28	31
11		
12		
13		
14		
15		
Mean	27.800	28.000
Std Dev.	2.974	3.333
# Replicates	10	10
T-Test Result	5.6374	
Deg. of Freedom	16	
Critical T Value	0.8647	
Pass or Fail	PASS	

Replicate No.	Test Completion Date: 1/11/2022 Control	TIWC
1	28	36
2	13	29
3	12	29
4	25	34
5	13	34
6	18	32
7	29	33
8	35	32
9	23	34
10	29	28
11		
12		
13		
14		
15		
Mean	22.500	32.100
Std Dev.	8.086	2.644
# Replicates	10	10
T-Test Result	7.2773	
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	Ceriodaphnia
Endpoint	Survival
TIWC (decimal)	0.68
No. Per Replicate	1
TST b value	0.75
TST alpha value	0.2

Facility Name: Shippensburg WWTP

Permit No.: PA0030643

Test Completion Date: 5/17/2021

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: 8/2/2021

Replicate No.	Control	TIWC
1	1	1
2	1	1
3	1	1
4	1	1
5	1	1
6	1	0
7	1	1
8	1	1
9	1	1
10	1	1
11		
12		
13		
14		
15		
Mean	1.000	0.900
Std Dev.	0.000	0.316
# Replicates	10	10

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

Test Completion Date: 10/18/2021

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: 1/11/2022

Replicate No.	Control	TIWC
1	1	1
2	0	1
3	0	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	0.800	1.000
Std Dev.	0.422	0.000
# Replicates	10	10

T-Test Result: 4.0000
Deg. of Freedom: 9
Critical T Value: 0.8834
Pass or Fail: **PASS**

DEP Whole Effluent Toxicity (WET) Analysis Spreadsheet

Type of Test	Chronic
Species Tested	Pimephales
Endpoint	Survival
TIWC (decimal)	0.68
No. Per Replicate	10
TST b value	0.75
TST alpha value	0.25

Facility Name: Shippensburg WWTP

Permit No.: PA0030643

Test Completion Date: 5/18/2021

Replicate No.	Control	TIWC
1	1	1
2	1	1
3	0.9	1
4	0.8	0.9
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
Mean	0.925	0.975
Std Dev.	0.096	0.050
# Replicates	4	4

T-Test Result	11.3348
Deg. of Freedom	5
Critical T Value	0.7267
Pass or Fail	PASS

Test Completion Date: 8/3/2021

Replicate No.	Control	TIWC
1	0.9	0.9
2	1	1
3	0.9	0.9
4	0.8	1
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
Mean	0.900	0.950
Std Dev.	0.082	0.058
# Replicates	4	4

T-Test Result	11.6620
Deg. of Freedom	5
Critical T Value	0.7267
Pass or Fail	PASS

Test Completion Date: 10/19/2021

Replicate No.	Control	TIWC
1	1	1
2	1	0.8
3	1	1
4	1	1
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
Mean	1.000	0.900
Std Dev.	0.000	0.200
# Replicates	4	4

T-Test Result	3.3314
Deg. of Freedom	3
Critical T Value	0.7649
Pass or Fail	PASS

Test Completion Date: 1/11/2022

Replicate No.	Control	TIWC
1	1	1
2	1	0.9
3	1	1
4	1	1
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
Mean	1.000	0.975
Std Dev.	0.000	0.050
# Replicates	4	4

T-Test Result	17.8623
Deg. of Freedom	3
Critical T Value	0.7649
Pass or Fail	PASS

DEP Whole Effluent Toxicity (WET) Analysis Spreadsheet

Type of Test	Chronic
Species Tested	Pimephales
Endpoint	Growth
TIWC (decimal)	0.68
No. Per Replicate	10
TST b value	0.75
TST alpha value	0.25

Facility Name: Shippensburg WWTP

Permit No.: PA0030643

Replicate No.	Test Completion Date: 5/18/2021 Control	TIWC
1	0.305	0.427
2	0.335	0.401
3	0.331	0.426
4	0.341	0.404
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
Mean	0.328	0.415
Std Dev.	0.016	0.014
# Replicates	4	4

T-Test Result	18.4008
Deg. of Freedom	5
Critical T Value	0.7267
Pass or Fail	PASS

Replicate No.	Test Completion Date: 8/3/2021 Control	TIWC
1	0.264	0.226
2	0.262	0.241
3	0.264	0.288
4	0.25	0.311
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
Mean	0.260	0.267
Std Dev.	0.007	0.040
# Replicates	4	4

T-Test Result	3.5715
Deg. of Freedom	3
Critical T Value	0.7649
Pass or Fail	PASS

Replicate No.	Test Completion Date: 10/19/2021 Control	TIWC
1	0.348	0.296
2	0.341	0.23
3	0.334	0.307
4	0.334	0.363
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
Mean	0.339	0.299
Std Dev.	0.007	0.055
# Replicates	4	4

T-Test Result	1.6267
Deg. of Freedom	3
Critical T Value	0.7649
Pass or Fail	PASS

Replicate No.	Test Completion Date: 1/11/2022 Control	TIWC
1	0.413	0.329
2	0.486	0.314
3	0.309	0.337
4	0.376	0.4233
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
Mean	0.396	0.351
Std Dev.	0.074	0.049
# Replicates	4	4

T-Test Result	1.4525
Deg. of Freedom	5
Critical T Value	0.7267
Pass or Fail	PASS

WET Summary and Evaluation

Facility Name	Shippensburg WWTP
Permit No.	PA0030643
Design Flow (MGD)	4.3
Q_{7-10} Flow (cfs)	3.06
PMF_a	1
PMF_c	1

		Test Results (Pass/Fail)			
		Test Date	Test Date	Test Date	Test Date
Species	**Endpoint**	5/17/21	8/2/21	10/18/21	1/11/22
Ceriodaphnia	Reproduction	PASS	PASS	PASS	PASS

		Test Results (Pass/Fail)			
		Test Date	Test Date	Test Date	Test Date
Species	**Endpoint**	5/17/21	8/2/21	10/18/21	1/11/22
Ceriodaphnia	Survival	PASS	PASS	PASS	PASS

		Test Results (Pass/Fail)			
		Test Date	Test Date	Test Date	Test Date
Species	**Endpoint**	5/18/21	8/3/21	10/19/21	1/11/22
Pimephales	Survival	PASS	PASS	PASS	PASS

		Test Results (Pass/Fail)			
		Test Date	Test Date	Test Date	Test Date
Species	**Endpoint**	5/18/21	8/3/21	10/19/21	1/11/22
Pimephales	Growth	PASS	PASS	PASS	PASS

Reasonable Potential? NO

Permit Recommendations

Test Type	**Chronic**
TIWC	**68** % Effluent
Dilution Series	**17, 34, 68, 84, 100** % Effluent
Permit Limit	**None**
Permit Limit Species	

WET Summary and Evaluation

Facility Name	Shippensburg WWTP
Permit No.	PA0030643
Design Flow (MGD)	4.95
Q_{7-10} Flow (cfs)	3.06
PMF_a	1
PMF_c	1

		Test Results (Pass/Fail)			
		Test Date	Test Date	Test Date	Test Date
Species	**Endpoint**	5/17/21	8/2/21	10/18/21	1/11/22
Ceriodaphnia	Reproduction	PASS	PASS	PASS	PASS

		Test Results (Pass/Fail)			
		Test Date	Test Date	Test Date	Test Date
Species	**Endpoint**	5/17/21	8/2/21	10/18/21	1/11/22
Ceriodaphnia	Survival	PASS	PASS	PASS	PASS

		Test Results (Pass/Fail)			
		Test Date	Test Date	Test Date	Test Date
Species	**Endpoint**	5/18/21	8/3/21	10/19/21	1/11/22
Pimephales	Survival	PASS	PASS	PASS	PASS

		Test Results (Pass/Fail)			
		Test Date	Test Date	Test Date	Test Date
Species	**Endpoint**	5/18/21	8/3/21	10/19/21	1/11/22
Pimephales	Growth	PASS	PASS	PASS	PASS

Reasonable Potential? NO

Permit Recommendations

Test Type	**Chronic**
TIWC	**71** % Effluent
Dilution Series	**18, 36, 71, 86, 100** % Effluent
Permit Limit	**None**
Permit Limit Species	