pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Southcentral Regional Office
CLEAN WATER PROGRAM

Application Type	**Renewal**	Application No.	**PA0026077**
Facility Type	**Municipal**	APS ID	**320055**
Major / Minor	**Major**	Authorization ID	**1395615**

NPDES PERMIT FACT SHEET
INDIVIDUAL SEWAGE

Applicant and Facility Information

Applicant Name	**Carlisle Borough**	Facility Name	**Carlisle Regional WWTP**
Applicant Address	54 N Middlesex Road	Facility Address	54 N Middlesex Road
	Carlisle, PA 17013-1627		Carlisle, PA 17013-1627
Applicant Contact	Mark Malarich	Facility Contact	Sara Crawshaw
Applicant Phone	(717) 240-6932	Facility Phone	(717) 240-6991
Client ID	8155	Site ID	252608
Ch 94 Load Status	Not Overloaded	Municipality	Middlesex Township
Connection Status	No Limitations	County	Cumberland
Date Application Received	May 6, 2022	EPA Waived?	No
Date Application Accepted	May 18, 2022	If No, Reason	Major Facility, Pretreatment, Significant CB Discharge
Purpose of Application	NPDES Permit Renewal		

Summary of Review

Carlisle Borough (Carlisle) has applied to the Pennsylvania Department of Environmental Protection (DEP) for reissuance of its NPDES permit. The permit was last reissued on October 13, 2017 and became effective on November 1, 2017. The permit expired on October 31, 2022 but the terms and conditions have been extended since that time.

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

Sludge use and disposal description and location(s): Sludge is processed onsite prior to being land-applied under PAG083570.

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	November 2, 2022
X		Daniel W. Martin Daniel W. Martin, P.E. / Environmental Engineer Manager	November 15, 2022

Discharge, Receiving Waters and Water Supply Information			
Outfall No.	001	Design Flow (MGD)	7.0
Latitude	40º 14' 14"	Longitude	-77º 8' 46"
Quad Name	Carlisle	Quad Code	1728
Wastewater Description:	Treated Sewage		
Receiving Waters	Conodoguinet Creek	Stream Code	10194
NHD Com ID	56405295	RMI	31.99
Drainage Area	396 sq.mi	Yield (cfs/mi^2)	0.125
Q_{7-10} Flow (cfs)	49.45	Q_{7-10} Basis	USGS gage no. 01570000
Elevation (ft)		Slope (ft/ft)	
Watershed No.	7-B	Chapter 93 Class.	WWF
Existing Use	None	Existing Use Qualifier	None
Exceptions to Use	None	Exceptions to Criteria	None
Assessment Status	Impaired		
Cause(s) of Impairment	Organic Enrichment		
Source(s) of Impairment	Unknown		
TMDL Status	N/A	Name	N/A
Nearest Downstream Public Water Supply Intake	PA American Water		
PWS Waters	Conodoguinet Creek	Flow at Intake (cfs)	72.82
PWS RMI	19.14	Distance from Outfall (mi)	12.8

Drainage Area
The discharge is to Conodoguinet Creek at RM 31.99. A drainage area upstream of the discharge point is estimated to be 396 sq.mi. according to be USGS StreamStats available at https://streamstats.usgs.gov/ss/.

Streamflow
The USGS gauging station no. 01570000 on Conodoguinet Creek near Hogestown is located about 12 miles downstream from the point of discharge. The latest low-flow gauge information has been correlated with the drainage area at the point of discharge to calculate the following site-specific low-flows:

Low-Flow Yield = $Q7\text{-}10_{gage}$ / $Drainage\ Area_{gage}$ = 69.3 cfs / 470 sq.mi = 0.147 cfs/sq.mi
$Q7\text{-}10_{site}$ = Low-Flow Yield x $Drainage\ Area_{site}$ = 0.147 cfs/sq.mi * 396 sq.mi = 58.212 cfs
Q30-10:Q7-10 = 78.3 cfs : 69.3 cfs = 1.13:1
Q1-10:Q7-10 = 63.1 cfs : 69.3 cfs = 0.91:1

Conodoguinet Creek
Conodoguinet Creek is designated under 25 Pa Code §93.9o as a warm water and migratory fishes surface water. No special protection waters are impacted by this discharge. Conodoguinet Creek is currently identified as an impaired stream. The impairment identified in 2018 according to the latest integrated water quality report is an organic enrichment as a result of unknown source(s). It is listed as a Category 5 which requires a development of a TMDL. No TMDL has yet been developed to address this impairment.

Public Water Supply Intake
The nearest downstream public water supply intake is PA American Water located on Conodoguinet Creek, approximately 12 miles from the point of discharge. Considering the distance, the discharge is not expected to significantly impact the intake.

Treatment Facility Summary				
Treatment Facility Name: Carlisle Region Water Pollution Control Facility				
WQM Permit No.	**Issuance Date**			
2109405	11/18/2009			
2174406 08-1	02/09/2009			
2119402	08/23/2019			
Waste Type	**Degree of Treatment**	**Process Type**	**Disinfection**	**Avg Annual Flow (MGD)**
Sewage	Tertiary	Activated Sludge	Gas Chlorine	7.0
Hydraulic Capacity (MGD)	**Organic Capacity (lbs/day)**	**Load Status**	**Biosolids Treatment**	**Biosolids Use/Disposal**
9.45	27460	Not Overloaded	Gravity Thickening	Land application

Carlisle owns and operates a municipal wastewater treatment facility located at 54 North Middlesex Road, Carlisle PA, serving the areas within the Borough of Carlisle (58.22%), Middlesex Township (19.87%), South Middleton Township (14.43%), Silver Spring Township (2.93%), North Middleton Township (4.41%) and West Pennsboro Township (0.14%). All sewer systems are 100% separated. The facility previously had both annual average design flow and hydraulic design capacity of 7.0 MGD. On November 18, 2009, a Water Quality Management (WQM) permit was issued for the biological nutrient removal (BNR) upgrade and installation of cloth disk filters. As part of this WQM permit, hydraulic design capacity has increased to 9.45 MGD and the design organic capacity has increased to 27,460 lbs/day BOD. Under 25 Pa Code §92a.26(b), the facility is categorized as a major facility discharging more than 5.0 MGD of treated sewage. The facility currently utilizes a 5-stage activated sludge treatment process consisting of the following units:

Mechanical Bar Screen → Grit Removal → Primary Clarifiers (2) → 1st Stage BNR basins (2) → 1st Stage Clarifiers (2) → 2nd Stage BNR basins (4) → 2nd Stage Clarifiers (2) → Kruger Cloth Disc Filtration (3) → Chlorine Contact Tanks (2) → Outfall 001 to Conodoguinet Creek

Each of these BNR basins is divided into different treatment zones: Pre-Anoxic, Anaerobic, Anoxic, Aeration, De-Ox, Post-Anoxic and Reaeration. At average flows (3.5 MGD), the plant will operate in a five-stage BNR mode to maximize Total Nitrogen (TN) and Total Phosphorus (TP) removal with minimal chemical addition. When flow reaches 5.5 MGD, the plant can be operated in either a Johannesburg or MLE (Modified Ludzack-Ettinger) BNR configuration which would allow the post-anoxic zones be utilized as additional aeration volume for nitrification to meet DEP's Chesapeake Bay Tributary Strategy nutrient requirements (i.e., 6.0 mg/L TN, 0.8 mg/L TP) under the increased flow conditions. As part of this upgrade, an evaluation of the treatment performance was expected to be completed by 2019 to determine whether the purchase of nutrient credits would be more feasible than proposing the construction of Phase II with additional BNR basins.

Chlorine gas is used for disinfection. Alum is added for phosphorous removal. Sludge holding tanks (4) and thickeners (2) are installed for solid process. Sludge generated from the facility will be land-applied under PAG083570 (last issued on 3/8/2017)

The table below summarizes a list of industrial/commercial users currently contributing industrial wastewaters to the sewer system.

Business Name	Type of Business	Municipality	Total Flow (GPD)*	Significant User?
Bimbo Bakeries USA Inc.	Manufacture of Fried Cake Style Doughnuts	Borough of Carlisle	23,000	Yes
Pratt, Carlisle Corrugating	Manufacture of corrugated boxes	Borough of Carlisle	4,000	Yes
Carlisle Construction Materials Inc.	Manufacture of rubber roofing materials/adhesive products	Borough of Carlisle	18,895	Yes
Frog Switch & Manufacturing Program	Manufacture of manganese steel castings	Borough of Carlisle	12,500	Yes

Business Name	Type of Business	Municipality	Total Flow (GPD)*	Significant User?
Pilot Flying J Travel Plaza	truck maintenance, tire shop	Middlesex Township	37,000	Yes
UPMC Carlisle	Hospital	South Middleton Township	50,471	Yes
Ames True Temper	Manufacture of garden tools	South Middleton Township	1,100	Yes

The last permit renewal application reported Hoffman Materials as one of industrial/commercial users. Carlisle indicated that Hoffman Materials has ceased all manufacturing operations and no longer discharges process wastewater.

The Borough currently maintains and operates an EPA-approved pretreatment program. DEP will therefore continue to include permit conditions that dictate the operation and implementation of a pretreatment program.

The facility currently has the following stormwater outfalls collecting stormwater run-off drained from the property:

Outfall no.	Latitude	Longitude	Description
S01	40º 14' 15"	-77º 08' 49"	West Outfall
S02	40º 14' 12"	-77º 08' 44"	East Outfall
S03	40º 14' 10"	-77º 08' 42"	Administrative/Lab Bldg.

Compliance History

Summary of DMRs:	A summary of the past 12-month DMR data is presented on the next page.
Summary of Inspections:	10/22/2021: Brandon Bettinger, DEP Water Quality Specialist, conducted a routine inspection and noted that it was observed that the floor of the headworks building contained rags, screenings, and other solid debris that were dispersed during the screening process. A good housekeeping was recommended, and no violation was noted at the time of inspection. 09/14/2020: Michael Benham, former DEP Water Quality Specialist, conducted a routine inspection. No specific issues/violations were noted at the time of inspection.
Other Comments:	A number of permit violations have been reported since the last permit reissuance. These violations are shown below.

Date	Violation Type	Column1	Parameter	Results	Limits	Units	SBC
5/15/2018		Unauthorized Discharges					
8/21/2018	Violation of permit condition	Effluent	Fecal Coliform	12800	1000	No./100 ml	IMAX
9/18/2018		Unauthorized Discharges					
4/1/2019	Late DMR Submission	Other Violations					
8/12/2019	Violation of permit condition	Effluent	Fecal Coliform	2900	1000	No./100 ml	IMAX
3/10/2020	Sample collection less frequent than required	Other Violations					
6/9/2020	Violation of permit condition	Effluent	Fecal Coliform	8300	1000	No./100 ml	IMAX
7/27/2021	Violation of permit condition	Effluent	Fecal Coliform	1040	1000	No./100 ml	IMAX
10/26/2021	Violation of permit condition	Effluent	Fecal Coliform	> 2000	1000	No./100 ml	IMAX
6/13/2022	Violation of permit condition	Effluent	Fecal Coliform	2500	1000	No./100 ml	IMAX
5/19/2022		Unauthorized Discharges					

DEP's database revealed that there is no open violations associated with this permittee or facility.

Effluent Data

DMR Data for Outfall 001 (from May 1, 2021 to April 30, 2022)

Parameter	APR-22	MAR-22	FEB-22	JAN-22	DEC-21	NOV-21	OCT-21	SEP-21	AUG-21	JUL-21	JUN-21	MAY-21
Flow (MGD) Average Monthly	2.731	2.692	2.823	2.419	2.25	2.865	3.086	4.557	3.195	2.91	2.455	2.499
Flow (MGD) Daily Maximum	3.568	2.994	3.811	2.644	2.527	3.887	4.199	8.841	4.939	3.507	3.067	3.380
pH (S.U.) Minimum	7.35	7.37	7.36	7.41	7.49	7.50	7.47	7.38	7.61	7.66	7.55	7.53
pH (S.U.) Instantaneous Maximum	7.69	7.82	7.72	7.73	7.79	7.88	7.92	8.04	7.97	7.96	7.89	7.90
DO (mg/L) Minimum	9.8	10.0	10.5	10.0	9.9	9.50	8.8	8.4	8.4	8.5	8.6	9.1
TRC (mg/L) Average Monthly	0.31	0.35	0.39	0.42	0.36	0.36	0.36	0.41	0.38	0.38	0.37	0.33
TRC (mg/L) Instantaneous Maximum	1.03	0.60	0.76	0.72	0.48	0.49	0.44	0.98	1.28	0.72	0.75	0.44
CBOD5 (lbs/day) Average Monthly	< 71	< 71	< 72	< 61.0	< 58	< 73	< 86	< 142	< 82	< 88	62	< 63
CBOD5 (lbs/day) Weekly Average	< 75	< 81	< 74	< 62.0	< 62	< 83	< 94	< 194	< 96	< 138	< 73	< 71
CBOD5 (mg/L) Average Monthly	< 3.0	< 3.1	< 3.1	< 3.0	< 3.1	< 3.1	< 3.4	< 3.6	< 3.1	< 3.6	< 3.0	< 3.0
CBOD5 (mg/L) Weekly Average	< 3.0	< 3.2	< 3.2	< 3.0	< 3.2	< 3.1	< 3.9	< 4.7	< 3.2	< 5.8	< 3.2	< 3.1
BOD5 (lbs/day) Raw Sewage Influent Average Monthly	5859	5604	6001	5212	255	5032	4954	5376	6099	5540	5075	4495
BOD5 (lbs/day) Raw Sewage Influent Daily Maximum	7300	7169	9527	6686	308	7463	7135	17757	9472	8222	7455	5706
BOD5 (mg/L) Raw Sewage Influent Average Monthly	244	247	235	231	5445	197	191	145	270	259	244	206
TSS (lbs/day) Average Monthly	< 49	< 58	< 51	< 44	< 39	< 48	< 89	< 89	< 55	< 74	< 41	< 42
TSS (lbs/day) Raw Sewage Influent Average Monthly	6060	6380	6443	3289	6257	6224	6594	7239	7196	6591	6651	6270

Parameter	APR-22	MAR-22	FEB-22	JAN-22	DEC-21	NOV-21	OCT-21	SEP-21	AUG-21	JUL-21	JUN-21	MAY-21
TSS (lbs/day) Raw Sewage Influent Daily Maximum	7775	8438	9029	3775	8433	8315	9377	17815	13373	8315	8323	8702
TSS (lbs/day) Weekly Average	< 61	64	< 58	< 51	< 42	< 52	< 117	< 117	< 66	< 86	< 49	< 47
TSS (mg/L) Average Monthly	< 2.2	< 2.6	< 2.2	< 2.2	< 2.1	< 2.0	< 2.2	< 2.2	< 2.0	< 2.0	< 2.0	< 2.0
TSS (mg/L) Raw Sewage Influent Average Monthly	258	285	253	264	292	243	252	197	314	308	320	287
TSS (mg/L) Weekly Average	3.4	3.0	< 3.0	< 2.3	< 2.1	< 2.0	< 2.5	< 2.5	< 2.1	< 2.0	< 2.0	< 2.0
Fecal Coliform (No./100 ml) Geometric Mean	< 5	< 1	< 2	< 1	< 2	< 3	5	13	< 3	< 2	< 5	< 5
Fecal Coliform (No./100 ml) Instantaneous Maximum	650	12	10	22	40	8	76	> 2000	25	29	1040	200
Nitrate-Nitrite (mg/L) Average Monthly	< 3.76	3.99	3.73	3.16	4.02	3.64	3.86	4.28	4.82	4.19	3.67	3.42
Nitrate-Nitrite (lbs) Total Monthly	< 2621	2705	2334	2006	2396	2592	2954	4505	3835	3128	< 2381	2229
Total Nitrogen (mg/L) Average Monthly	< 5.67	14.62	9.15	5.16	< 5.84	< 4.87	4.99	5.55625	6.22	5.85	< 5.12	< 4.86
Total Nitrogen (lbs) Effluent Net Total Monthly	< 3975	10209	5783	3281	< 3478	< 3479	3855	4504.8	4954	4368	< 3296	< 3118
Total Nitrogen (lbs) Total Monthly	< 3975	10209	5783	3281	< 3478	< 3479	3855	4504.8	4954	4368	3296	< 3155
Total Nitrogen (lbs) Effluent Net Total Annual								< 56535				
Total Nitrogen (lbs) Total Annual								< 56535				
Ammonia (lbs/day) Average Monthly	< 9	223	179	< 23	< 2	< 2	< 3	< 17	< 6	< 2	< 2.1	< 2
Ammonia (mg/L) Average Monthly	< 0.34	9.68	7.5	< 1.13	< 0.1	< 0.10	< 0.10	< 0.38	< 0.19	< 0.10	< 0.10	< 0.10
Ammonia (lbs) Total Monthly	< 260	6928	5008	< 699	< 58	< 72	< 81	< 512	< 171	< 75	< 61	< 65
Ammonia (lbs) Total Annual								< 5125				

Parameter	APR-22	MAR-22	FEB-22	JAN-22	DEC-21	NOV-21	OCT-21	SEP-21	AUG-21	JUL-21	JUN-21	MAY-21
TKN (mg/L) Average Monthly	1.9	10.6	5.4	2	< 1.8	< 1.2	< 1.1	< 1.3	1.4	1.7	< 1.4	< 1.4
TKN (lbs) Total Monthly	1354	7503	3449	1275	< 1082	< 887	< 902	< 1180	1119	1239	< 915	< 926
Total Phosphorus (lbs/day) Average Monthly	4	9	4	4	3	9	9	23	6	7	3.3	3
Total Phosphorus (mg/L) Average Monthly	0.2	0.29	0.17	0.23	0.16	0.38	0.37	0.56	0.23	0.30	0.16	0.12
Total Phosphorus (lbs) Effluent Net Total Monthly	135	204	111	139	92	279	280	680	190	222	97	78
Total Phosphorus (lbs) Total Monthly	135	204	111	139	92	279	280	680	190	222	97	78
Total Phosphorus (lbs) Effluent Net Total Annual								< 1864				
Total Phosphorus (lbs) Total Annual								< 1864				
Total Copper (mg/L) Average Monthly	0.011	0.014	0.0065	0.0087	0.0072	0.0060	0.0054	0.0041575	0.0051	0.00536	0.0165	0.0058
Total Copper (mg/L) Daily Maximum	0.015	0.015	0.0089	0.011	0.0083	0.0086	0.0065	0.00513	0.0064	0.0068	0.070	0.0067
Total Hardness (mg/L) Average Monthly	223	242	259	240	253	258	281	259.25	258	262	249	242
Total Hardness (mg/L) Downstream Monitoring Average Monthly	137	140	159	157	211	164	203	< 172	185	179	172	191
Total Hardness (mg/L) Instream Monitoring Average Monthly	137	138	150	147	207	166	218	165	202	163	179	180
Total Hardness (mg/L) Daily Maximum	234	275	275	286	286	276	311	263	263	292	280	260
Total Hardness (mg/L) Downstream Monitoring Daily Maximum	158	149	200	171	214	182	233	194	200	204	216	196
Total Hardness (mg/L) Instream Monitoring Daily Maximum	166	168	205	168	211	197	229	194	218	190	217	204

Existing Effluent Limits and Monitoring Requirements

A table below summarizes effluent limits and monitoring requirements specified in the existing permit.

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly	Weekly Average	Minimum	Average Monthly	Weekly Average	Instant. Maximum		
Flow (MGD)	Report	Report Daily Max	XXX	XXX	XXX	XXX	Continuous	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
Total Residual Chlorine (TRC)	XXX	XXX	XXX	0.5	XXX	1.6	1/day	Grab
CBOD5 Nov 1 - Apr 30	1459	2335	XXX	25.0	40.0	70	2/week	24-Hr Composite
CBOD5 May 1 - Oct 31	992	1576	XXX	17.0	27.0	47	2/week	24-Hr Composite
BOD5 Raw Sewage Influent	Report	Report Daily Max	XXX	Report	XXX	XXX	2/week	24-Hr Composite
Total Suspended Solids	1751	2627	XXX	30.0	45.0	85	2/week	24-Hr Composite
Total Suspended Solids Raw Sewage Influent	Report	Report Daily Max	XXX	Report	XXX	XXX	2/week	24-Hr Composite
Fecal Coliform (No./100 ml) May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	XXX	1000	2/week	Grab
Fecal Coliform (No./100 ml) Oct 1 - Apr 30	XXX	XXX	XXX	2000 Geo Mean	XXX	10000	2/week	Grab
Ammonia-Nitrogen May 1 - Oct 31	192	XXX	XXX	3.3	XXX	9.2	2/week	24-Hr Composite
Ammonia-Nitrogen Nov 1 - Apr 30	577	XXX	XXX	9.9	XXX	27	2/week	24-Hr Composite
Total Phosphorus	58	XXX	XXX	1.0	XXX	2.8	2/week	24-Hr Composite
Copper, Total	XXX	XXX	XXX	Report	Report Daily Max	XXX	1/week	24-Hr Composite
Hardness, Total (as CaCO3)	XXX	XXX	XXX	Report	Report Daily Max	XXX	1/week	Grab
Hardness, Total (as CaCO3) Instream Monitoring	XXX	XXX	XXX	Report	Report Daily Max	XXX	1/week	Grab

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) [1]		Concentrations (mg/L)				Minimum [2] Measurement Frequency	Required Sample Type
	Monthly	Annual	Monthly	Monthly Average	Maximum	Instant. Maximum		
Ammonia--N	Report	Report	XXX	Report	XXX	XXX	2/week	24-Hr Composite
Kjeldahl--N	Report	XXX	XXX	Report	XXX	XXX	2/week	24-Hr Composite
Nitrate-Nitrite as N	Report	XXX	XXX	Report	XXX	XXX	2/week	24-Hr Composite
Total Nitrogen	Report	Report	XXX	Report	XXX	XXX	1/month	Calculation
Total Phosphorus	Report	Report	XXX	Report	XXX	XXX	2/week	24-Hr Composite
Net Total Nitrogen	Report	127852	XXX	XXX	XXX	XXX	1/month	Calculation
Net Total Phosphorus	Report	17047	XXX	XXX	XXX	XXX	1/month	Calculation

Development of Effluent Limitations and Monitoring Requirements

Outfall No. 001 **Design Flow (MGD)** 7
Latitude 40º 14' 14.27" **Longitude** -77º 8' 46.56"
Wastewater Description: Sewage Effluent

Technology-Based Limitations

The following technology-based limitations apply, subject to water quality analysis and BPJ where applicable:

Pollutant	Limit (mg/l)	SBC	Federal Regulation	State Regulation
$CBOD_5$	25	Average Monthly	133.102(a)(4)(i)	92a.47(a)(1)
	40	Average Weekly	133.102(a)(4)(ii)	92a.47(a)(2)
Total Suspended Solids	30	Average Monthly	133.102(b)(1)	92a.47(a)(1)
	45	Average Weekly	133.102(b)(2)	92a.47(a)(2)
pH	6.0 – 9.0 S.U.	Min – Max	133.102(c)	95.2(1)
Fecal Coliform (5/1 – 9/30)	200 / 100 ml	Geo Mean	-	92a.47(a)(4)
Fecal Coliform (5/1 – 9/30)	1,000 / 100 ml	IMAX	-	92a.47(a)(4)
Fecal Coliform (10/1 – 4/30)	2,000 / 100 ml	Geo Mean	-	92a.47(a)(5)
Fecal Coliform (10/1 – 4/30)	10,000 / 100 ml	IMAX	-	92a.47(a)(5)
Total Residual Chlorine	0.5	Average Monthly	-	92a.48(b)(2)

Water Quality-Based Limitations

CBOD5, NH3-N and Dissolved Oxygen (DO)
WQM 7.0 version 1.0b 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 multiple discharge analysis is necessary as there are a number of facilities including North Middleton Authority WWTP (PA0024384; RMI 33.8) and Country Manor West MHP WWTP (PA0082015; RMI 27.46) located in close vicinity of the facility that have similar effluent characteristics[1]. The model output showed that existing effluent limits are still appropriate and protective of water quality. No change is therefore recommended.

Total Residual Chlorine (TRC)
Since chlorine is used for disinfection, DEP's TRC_CALC worksheet was utilized to determine if existing TRC limits of 0.5 mg/L (average monthly) and 1.6 mg/L (instantaneous maximum) are still appropriate. The worksheet indicated that existing limits are still protective of water quality. No changes are therefore recommended.

Toxics
DEP utilizes a Toxics Management Spreadsheet (TMS) to facilitate calculations necessary for completing a reasonable potential analysis and determining WQBELs for toxic pollutants. The worksheet combines the functionality of DEP's previous water quality models including Toxics Screening Analysis worksheet and PENTOXSD. The worksheet recommends a routine monitoring for Free Cyanide and Total Zinc. For Total Copper, the existing permit requires a weekly monitoring and sample results reported in monthly DMRs have been entered into DEP's TOXCON Spreadsheet along with instream/downstream/effluent hardness values to generate statistical average monthly concentrations (AMCs). Once these AMCs were entered into TMS, TMS recommend that a monitoring for Total Copper be continued. No change is therefore recommended for the existing monitoring requirement for Total Copper. Given that Total Copper effluent levels have been consistent, it is recommended that the monitoring frequency be changed from 1/week to 2/month. This 2/month will also apply to effluent/instream/downstream hardness as well as Free Cyanide and Total Zinc monitoring.

[1] The modeling efforts included upstream discharger, Carlisle Borough WTP, in the model but this facility discharges industrial waste generated from water treatment plant; no biological process is involved therefore this facility has been purposely excluded from modeling.

Best Professional Judgment (BPJ) Limitations

Total Phosphorus
DEP's technical guidance no. 391-2000-018 recommends phosphorus controls when the facility is expected to contribute more than 0.25% of the total point source phosphorus loading at the point of impact. DEP's SOP also recommends, at minimum, a routine monitoring of phosphorus for all sewage facilities or effluent limits if the receiving stream is evidently impaired for nutrients. The current NPDES permit contains average monthly and IMAX limits of 1.0 mg/L and 2.8 mg/L, respectively. The fact sheet prepared for the last permit renewal documents the following:

"Dissolved oxygen problems were noted in the Conodoguinet Creek during the mid 1980's. Central office and regional staff agreed on the need to reduce phosphorus levels in Conodoguinet Creek. We agreed to permit expanding facilities at the existing mass limit and a concentration of 2 mg/l since the measured flow at times may be less than the previous permitted flow. New facilities would be permitted at 1 mg/l. No expanding facility would be required to treat to less than 1 mg/l. Carlisle Borough's phosphorus limit is 1 mg/l so this did not affect the Borough."

The current effluent limits are seemingly BPJ effluent limits based on water quality of Conodoguinet Creek. The Borough has been consistently achieving compliance with these effluent limits; therefore, no change is needed. The relaxation or removal of these limits is also prohibited by EPA's anti-backsliding regulation found in 40 CFR § 122.44(l)(1).

Dissolved Oxygen
A minimum of 5.0 mg/L is an existing effluent limit and a DO water quality criterion set forth in 25 Pa. Code § 93.7(a). This 5.0 mg/L is an existing effluent limit and will remain unchanged in the draft permit to ensure that water quality standards are protected and maintained. It is also determined to be appropriate according to water quality modeling. This requirement is consistent with DEP's SOP and has also been assigned to other POTWs in the region.

Instantaneous Maximum Effluent Limits (IMAX)
The current NPDES permit renewal specifies IMAX of 70 mg/L for CBOD5, 85 mg/L for TSS, 9.2 mg/L for Ammonia-N and 2.8 mg/L for Total Phosphorus. In general, IMAX are determined using multipliers of 2 (conventional pollutants) or 2.5 (toxic pollutants). A file review revealed that during the 1995 permit review process, the Borough commented on the draft permit indicating that IMAX based upon a multiplier of 2.0 was inappropriate for the Borough. Although DEP often uses a multiplier of 2.0 or 2.5, alternative multiplier can also be applied using the long-term monitoring data on a case-by-case basis according to DEP's technical document no. 361-0100-003. IMAX are designed majorly to serve as basic reference points for comparing effluent grab samples during compliance inspections according to DEP's technical guidance no. 362-0400-001. As a result, DEP previously agreed to use a multiplier of 2.8 to calculate IMAX based on the statistical analysis. It is determined that the use of a multiplier of 2.8 is still appropriate. Existing IMAX will therefore remain unchanged.

Additional Considerations

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 directive from DEP Central Office Bureau of Clean Water Program:

> *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.*

The sample result shows that effluent contains a TDS maximum concentration level of 711 mg/L with the mass load of 17,316 lbs/day. The sample result also shows Bromide of <1.0 mg/L and 1,4-dioxane of <0.5 ug/L. Therefore, the requirement to monitor for these pollutants is not needed.

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 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 Requirement
DEP's SOP no. BCW-PMT-033 recommends a routine monitoring for E. Coli in all new and reissued sewage permits. As a result, a monthly monitoring requirement for E. Coli will be included in the permit given the facility's design flow is greater than 1.0 MGD.

Chesapeake Bay TMDL
Chesapeake Bay TMDL identifies the necessary pollution reductions of nitrogen, phosphorus and sediment across Delaware, Maryland, New York, Pennsylvania, Virginia, West Virginia and the District of Columbia and sets pollution limits necessary to meet applicable water quality standards in the Chesapeake Bay and its tidal tributaries. In order to meet these reduction goals, DEP has developed multiple plans including Chesapeake Bay Tributary Strategy (12/2004), Phase 1 Watershed Implementation Plan (January 2011), Phase 2 Watershed Implementation Plan (March 2012), and Phase 3 Watershed Implementation Plan (August 2019). More details on these plans are available at www.dep.pa.gov.

As part of Phase 3 Watershed Implementation Plan, Phase 3 Watershed Implementation Plan Wastewater Supplement was developed to provide an update on Chesapeake Bay TMDL implementation activities for point sources and current implementation strategy for wastewater. The following Cap Loads, annual effluent net mass load limits, specified in this document 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
PA0026077	1	Carlisle Borough	10/13/2017	10/31/2022	10/1/2008	127,852	-	17,047	0.951	0.436

The permit currently authorizes Carlisle to use 6,425 lbs TN /yr as offsets toward compliance with the TN Cap Load based on the connection of 257 on-lot sewage disposal system. No further offset request has been received from Carlisle during the last permit term.

Stormwater Requirements
Discharges of stormwater runoff from any POTWs (SIC Code 4952) described in 40 CFR § 122.26(b)(14)(ix) require coverage under an NPDES permit. DEP Central Office Bureau of Clean Water Program has developed the Part C standard condition which addresses stormwater requirements and site-specific best management practices (BMPs) associated with the POTWs. Such condition will prevent issuing another NPDES permit if the condition gets included in the existing permit.

Monitoring Frequency and Sample Type
Unless otherwise specified throughout this fact sheet, monitoring frequencies and sample types are derived from the "NPDES Permit Writer's Manual" (362-0400-001) and/or BPJ.

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.

Anti-Backsliding Requirements
Unless otherwise specified in this fact sheet, all permit requirements have been developed at least stringent as existing permit requirements. No Class A Wild Trout Fishery is impacted by this discharge.

Whole Effluent Toxicity (WET)

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

☒ For the permit renewal application (4 tests).
☐ Quarterly throughout the permit term.
☐ Quarterly throughout the permit term and a TIE/TRE was conducted.
☐ Other:

The dilution series used for the tests was: 100%, 59%, 18%, 9%, and 5%. The Target Instream Waste Concentration (TIWC) to be used for analysis of the results is: 18%.

Summary of Four Most Recent Test Results

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

TST Data Analysis

(NOTE – In lieu of recording information below, the application manager may attach the DEP WET Analysis Spreadsheet).

Test Date	*Ceriodaphnia* Results (Pass/Fail)		*Pimephales* Results (Pass/Fail)	
	Survival	Reproduction	Survival	Growth
Sept 2018	Pass	Pass	Pass	Pass
July 2019	Pass	Pass	Pass	Pass
June 2020	Pass	Pass	Pass	Pass
May 2021	Pass	Pass	Pass	Pass
Feb 2022	Pass	Pass	Pass	Fail
April 2022 (retest)			Pass	Pass

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

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

☐ **YES** ☒ **NO**

Comments: DEP's WET Analysis Spreadsheet is attached to this fact sheet that includes testing results for both original (February 2022) and retest (April 2022).

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

Acute Partial Mix Factor (PMFa): **0.142** Chronic Partial Mix Factor (PMFc): **0.986**

1. Determine IWC – Acute (IWCa):

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

[(7.0 MGD x 1.547) / ((58.212 cfs x 0.142) + (7.0 MGD x 1.547))] x 100 = **56%**

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. Determine Target IWCc (If Chronic Tests Required)

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

[(7.0 MGD x 1.547) / ((58.212 cfs x 0.986) + (7.0 MGD x 1.547))] x 100 = **15.87 = 16%**

3. Determine Dilution Series

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

Dilution Series = 100%, 58%, 16%, 8%, and 4%.

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).

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

Proposed Effluent Limitations and Monitoring Requirements

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

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

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly	Weekly Average	Minimum	Average Monthly	Weekly Average	Instant. Maximum		
Flow (MGD)	Report	Report Daily Max	XXX	XXX	XXX	XXX	Continuous	Measured
pH (S.U.)	XXX	XXX	6.0 Inst Min	XXX	XXX	9.0	1/day	Grab
DO	XXX	XXX	5.0 Daily Min	XXX	XXX	XXX	1/day	Grab
TRC	XXX	XXX	XXX	0.5	XXX	1.6	1/day	Grab
CBOD5 Nov 1 - Apr 30	1459	2335	XXX	25.0	40.0	70	2/week	24-Hr Composite
CBOD5 May 1 - Oct 31	992	1576	XXX	17.0	27.0	47	2/week	24-Hr Composite
BOD5 Raw Sewage Influent	Report	Report Daily Max	XXX	Report	XXX	XXX	2/week	24-Hr Composite
TSS	1751	2627	XXX	30.0	45.0	85	2/week	24-Hr Composite
TSS Raw Sewage Influent	Report	Report Daily Max	XXX	Report	XXX	XXX	2/week	24-Hr Composite
Fecal Coliform (No./100 ml) Oct 1 - Apr 30	XXX	XXX	XXX	2000 Geo Mean	XXX	10000	2/week	Grab
Fecal Coliform (No./100 ml) May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	XXX	1000	2/week	Grab
Nitrate-Nitrite	XXX	XXX	XXX	Report	XXX	XXX	2/week	24-Hr Composite
Nitrate-Nitrite (lbs)	Report Total Mo	XXX	XXX	XXX	XXX	XXX	1/month	Calculation
Total Nitrogen	XXX	XXX	XXX	Report	XXX	XXX	1/month	Calculation

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

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly	Weekly Average	Minimum	Average Monthly	Weekly Average	Instant. Maximum		
Total Nitrogen (lbs)	Report Total Mo	XXX	XXX	XXX	XXX	XXX	1/month	Calculation
Ammonia Nov 1 - Apr 30	577	XXX	XXX	9.9	XXX	27	2/week	24-Hr Composite
Ammonia May 1 - Oct 31	192	XXX	XXX	3.3	XXX	9.2	2/week	24-Hr Composite
Ammonia (lbs)	Report Total Mo	XXX	XXX	XXX	XXX	XXX	1/month	Calculation
TKN	XXX	XXX	XXX	Report	XXX	XXX	2/week	24-Hr Composite
TKN (lbs)	Report Total Mo	XXX	XXX	XXX	XXX	XXX	1/month	Calculation
Total Phosphorus	58	XXX	XXX	1.0	XXX	2.8	2/week	24-Hr Composite
Total Phosphorus (lbs)	Report Total Mo	XXX	XXX	XXX	XXX	XXX	1/month	Calculation
Total Copper	XXX	XXX	XXX	Report	Report Daily Max	XXX	2/month	24-Hr Composite
Total Hardness	XXX	XXX	XXX	Report	Report Daily Max	XXX	2/month	Grab
Total Hardness Instream	XXX	XXX	XXX	Report	Report Daily Max	XXX	2/month	Grab
Total Hardness Downstream	XXX	XXX	XXX	Report	Report Daily Max	XXX	2/month	Grab
Free Cyanide	XXX	XXX	XXX	Report	Report Daily Max	XXX	2/month	Grab
Total Zinc	XXX	XXX	XXX	Report	Report Daily Max	XXX	2/month	24-Hr Composite
E. Coli (No. / 100 mL)	XXX	XXX	XXX	XXX	XXX	Report	1/month	Grab

Proposed Effluent Limitations and Monitoring Requirements

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

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

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Monthly	Annual	Monthly	Monthly Average	Maximum	Instant. Maximum		
Total Nitrogen (lbs) Effluent Net	XXX	127852 Total Annual	XXX	XXX	XXX	XXX	1/year	Calculation
Total Nitrogen (lbs)	XXX	Report Total Annual	XXX	XXX	XXX	XXX	1/year	Calculation
Ammonia (lbs)	XXX	Report Total Annual	XXX	XXX	XXX	XXX	1/year	Calculation
Total Phosphorus (lbs)	XXX	Report Total Annual	XXX	XXX	XXX	XXX	1/year	Calculation
Total Phosphorus (lbs) Effluent Net	XXX	17047 Total Annual	XXX	XXX	XXX	XXX	1/year	Calculation

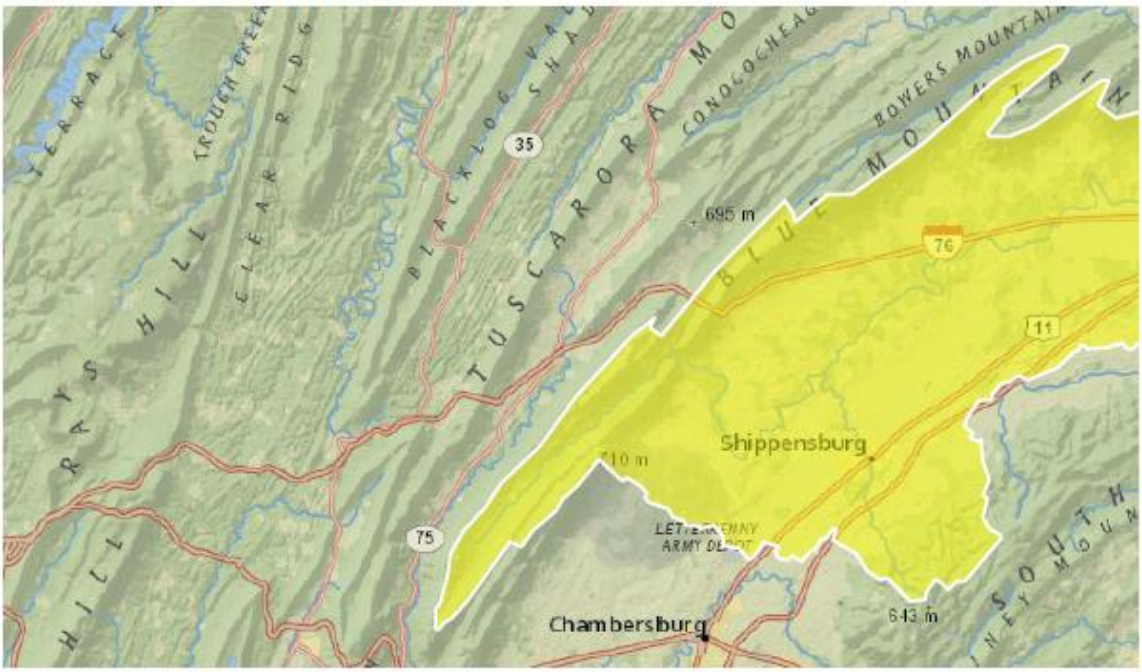
Tools and References Used to Develop Permit	
☐	WQM for Windows Model (see Attachment)
☐	Toxics Management Spreadsheet (see Attachment)
☐	TRC Model Spreadsheet (see Attachment)
☐	Temperature Model Spreadsheet (see Attachment)
☐	Water Quality Toxics Management Strategy, 361-0100-003, 4/06.
☐	Technical 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: PA20220630173412425000
Clicked Point (Latitude, Longitude): 40.23721, -77.14597
Time: 2022-06-30 13:34:34 -0400



Collapse All

Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
CARBON	Percentage of area of carbonate rock	33.57	percent
DRNAREA	Area that drains to a point on a stream	396	square miles
PRECIP	Mean Annual Precipitation	39	inches
ROCKDEP	Depth to rock	4.5	feet
STRDEN	Stream Density -- total length of streams divided by drainage area	1.77	miles per square mile

2. WQM 7.0 ver. 1.1

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	10194	CONODOGUINET CREEK	33.810	395.00	388.00	0.00000	0.00	☑

Stream Data

Design Cond.	LFY (cfsm)	Trib Flow (cfs)	Stream Flow (cfs)	Rch Trav Time (days)	Rch Velocity (fps)	WD Ratio	Rch Width (ft)	Rch Depth (ft)	Tributary Temp (°C)	Tributary pH	Stream Temp (°C)	Stream pH
Q7-10	0.147	0.00	0.00	0.000	0.000	0.0	0.00	0.00	25.00	7.00	0.00	0.00
Q1-10		0.00	0.00	0.000	0.000							
Q30-10		0.00	0.00	0.000	0.000							

Discharge Data

Name	Permit Number	Existing Disc Flow (mgd)	Permitted Disc Flow (mgd)	Design Disc Flow (mgd)	Reserve Factor	Disc Temp (°C)	Disc pH
North Middleton	PA0024384	1.3000	1.3000	1.3000	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	21.00	2.00	0.00	1.50
Dissolved Oxygen	5.00	8.24	0.00	0.00
NH3-N	7.50	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	10194	CONODOGUINET CREEK	**31.990**	392.00	396.00	0.00000	0.00	☑

Stream Data

Design Cond.	LFY (cfsm)	Trib Flow (cfs)	Stream Flow (cfs)	Rch Trav Time (days)	Rch Velocity (fps)	WD Ratio	Rch Width (ft)	Rch Depth (ft)	Tributary Temp (°C)	Tributary pH	Stream Temp (°C)	Stream pH
Q7-10	0.147	0.00	0.00	0.000	0.000	0.0	0.00	0.00	25.00	7.00	0.00	0.00
Q1-10		0.00	0.00	0.000	0.000							
Q30-10		0.00	0.00	0.000	0.000							

Discharge Data

Name	Permit Number	Existing Disc Flow (mgd)	Permitted Disc Flow (mgd)	Design Disc Flow (mgd)	Reserve Factor	Disc Temp (°C)	Disc pH
Carlisle STP	PA0026077	7.0000	7.0000	7.0000	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	17.00	2.00	0.00	1.50
Dissolved Oxygen	5.00	8.24	0.00	0.00
NH3-N	3.30	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	10194	CONODOGUINET CREEK	**27.480**	380.00	428.00	0.00000	0.00	☑

Stream Data

Design Cond.	LFY (cfsm)	Trib Flow (cfs)	Stream Flow (cfs)	Rch Trav Time (days)	Rch Velocity (fps)	WD Ratio	Rch Width (ft)	Rch Depth (ft)	Tributary Temp (°C)	Tributary pH	Stream Temp (°C)	Stream pH
Q7-10	0.147	0.00	0.00	0.000	0.000	0.0	0.00	0.00	25.00	7.00	0.00	0.00
Q1-10		0.00	0.00	0.000	0.000							
Q30-10		0.00	0.00	0.000	0.000							

Discharge Data

Name	Permit Number	Existing Disc Flow (mgd)	Permitted Disc Flow (mgd)	Design Disc Flow (mgd)	Reserve Factor	Disc Temp (°C)	Disc pH
Country Manor	PA0082015	0.1700	0.1700	0.1700	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	25.00	0.00	0.00	0.70

Input Data WQM 7.0

SWP Basin	Stream Code	Stream Name	RMI	Elevation (ft)	Drainage Area (sq mi)	Slope (ft/ft)	PWS Withdrawal (mgd)	Apply FC
07B	10194	CONODOGUINET CREEK	**26.920**	377.00	430.00	0.00000	0.00	☑

Stream Data

Design Cond.	LFY (cfsm)	Trib Flow (cfs)	Stream Flow (cfs)	Rch Trav Time (days)	Rch Velocity (fps)	WD Ratio	Rch Width (ft)	Rch Depth (ft)	Tributary Temp (°C)	Tributary pH	Stream Temp (°C)	Stream pH
Q7-10	0.147	0.00	0.00	0.000	0.000	0.0	0.00	0.00	25.00	7.00	0.00	0.00
Q1-10		0.00	0.00	0.000	0.000							
Q30-10		0.00	0.00	0.000	0.000							

Discharge Data

Name	Permit Number	Existing Disc Flow (mgd)	Permitted Disc Flow (mgd)	Design Disc Flow (mgd)	Reserve Factor	Disc Temp (°C)	Disc pH
		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	10194	CONODOGUINET 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												
33.810	57.04	0.00	57.04	2.0111	0.00031	1.041	128.49	123.39	0.44	0.252	24.83	7.00
31.990	58.21	0.00	58.21	12.8401	0.00050	1.035	135.39	130.83	0.51	0.544	24.10	7.00
27.480	62.92	0.00	62.92	13.1031	0.00101	1.021	135.66	132.82	0.55	0.062	24.14	7.00
Q1-10 Flow												
33.810	51.90	0.00	51.90	2.0111	0.00031	NA	NA	NA	0.42	0.265	24.81	7.00
31.990	52.97	0.00	52.97	12.8401	0.00050	NA	NA	NA	0.49	0.567	24.02	7.00
27.480	57.25	0.00	57.25	13.1031	0.00101	NA	NA	NA	0.53	0.065	24.07	7.00
Q30-10 Flow												
33.810	64.45	0.00	64.45	2.0111	0.00031	NA	NA	NA	0.47	0.236	24.85	7.00
31.990	65.78	0.00	65.78	12.8401	0.00050	NA	NA	NA	0.54	0.514	24.18	7.00
27.480	71.10	0.00	71.10	13.1031	0.00101	NA	NA	NA	0.58	0.059	24.22	7.00

WQM 7.0 Modeling Specifications

Parameters	Both	Use Inputted Q1-10 and Q30-10 Flows	☑
WLA Method	EMPR	Use Inputted W/D Ratio	☐
Q1-10/Q7-10 Ratio	0.91	Use Inputted Reach Travel Times	☐
Q30-10/Q7-10 Ratio	1.13	Temperature Adjust Kr	☑
D.O. Saturation	90.00%	Use Balanced Technology	☑
D.O. Goal	5		

WQM 7.0 D.O.Simulation

SWP Basin	Stream Code	Stream Name
07B	10194	CONODOGUINET CREEK

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
33.810	1.300	24.830	7.000
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
128.486	1.041	123.389	0.441
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
2.65	0.341	0.26	1.015
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
8.133	0.721	Tsivoglou	5
Reach Travel Time (days)			
0.252			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.025	2.62	0.25	7.56
0.050	2.59	0.24	7.56
0.076	2.56	0.24	7.56
0.101	2.54	0.23	7.56
0.126	2.51	0.22	7.56
0.151	2.48	0.22	7.56
0.176	2.46	0.21	7.56
0.202	2.43	0.21	7.56
0.227	2.40	0.20	7.56
0.252	2.38	0.20	7.56

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
31.990	8.300	24.096	7.000
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
135.392	1.035	130.827	0.507
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
4.60	0.787	0.67	0.959
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
7.182	1.314	Tsivoglou	5
Reach Travel Time (days)			
0.544			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.054	4.37	0.63	6.79
0.109	4.15	0.60	6.45
0.163	3.94	0.57	6.15
0.217	3.74	0.54	5.90
0.272	3.55	0.51	5.69
0.326	3.38	0.49	5.51
0.380	3.21	0.46	5.36
0.435	3.04	0.44	5.24
0.489	2.89	0.42	5.14
0.544	2.75	0.40	5.07

WQM 7.0 D.O.Simulation

SWP Basin	Stream Code	Stream Name
07B	10194	CONODOGUINET CREEK

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
27.480	8.470	24.138	7.000
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
135.655	1.021	132.823	0.549
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
2.78	0.585	0.46	0.963
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
5.267	2.865	Tsivoglou	5
Reach Travel Time (days)			
0.062			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.006	2.76	0.45	5.29
0.012	2.75	0.45	5.32
0.019	2.74	0.45	5.35
0.025	2.73	0.45	5.37
0.031	2.72	0.44	5.40
0.037	2.70	0.44	5.42
0.044	2.69	0.44	5.45
0.050	2.68	0.44	5.47
0.056	2.67	0.43	5.50
0.062	2.66	0.43	5.52

WQM 7.0 Wasteload Allocations

SWP Basin	Stream Code	Stream Name
07B	10194	CONODOGUINET 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
33.810	North Middleton	11.25	15	11.25	15	0	0
31.990	Carlisle STP	11.88	6.6	12.01	6.6	0	0
27.480	Country Manor	11.09	50	11.96	50	0	0

NH3-N Chronic Allocations

RMI	Discharge Name	Baseline Criterion (mg/L)	Baseline WLA (mg/L)	Multiple Criterion (mg/L)	Multiple WLA (mg/L)	Critical Reach	Percent Reduction
33.810	North Middleton	1.38	7.5	1.38	7.5	0	0
31.990	Carlisle STP	1.43	3.3	1.44	3.3	0	0
27.480	Country Manor	1.37	25	1.44	25	0	0

Dissolved Oxygen Allocations

RMI	Discharge Name	CBOD5		NH3-N		Dissolved Oxygen		Critical Reach	Percent Reduction
		Baseline (mg/L)	Multiple (mg/L)	Baseline (mg/L)	Multiple (mg/L)	Baseline (mg/L)	Multiple (mg/L)		
33.81	North Middleton	21	21	7.5	7.5	5	5	0	0
31.99	Carlisle STP	17	17	3.3	3.3	5	5	0	0
27.48	Country Manor	25	25	25	25	5	5	0	0

WQM 7.0 Effluent Limits

SWP Basin	Stream Code	Stream Name
07B	10194	CONODOGUINET 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)
33.810	North Middleton	PA0024384	1.300	CBOD5	21		
				NH3-N	7.5	15	
				Dissolved Oxygen			5

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)
31.990	Carlisle STP	PA0026077	7.000	CBOD5	17		
				NH3-N	3.3	6.6	
				Dissolved Oxygen			5

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)
27.480	Country Manor	PA0082015	0.170	CBOD5	25		
				NH3-N	25	50	
				Dissolved Oxygen			5

3. Toxics Management Spreadsheet

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Toxics Management Spreadsheet
Version 1.3, March 2021

Discharge Information

Instructions | Discharge | Stream

Facility: **Carlisle Regional WWTP** NPDES Permit No.: **PA0026077** 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
7	347	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	Strea m CV	Fate Coeff	FOS	Criteri a Mod	Chem Transl
Group 1	Total Dissolved Solids (PWS)	mg/L		711										
	Chloride (PWS)	mg/L		240										
	Bromide	mg/L	<	1										
	Sulfate (PWS)	mg/L		34.8										
	Fluoride (PWS)	mg/L												
Group 2	Total Aluminum	µg/L	<	10										
	Total Antimony	µg/L		0.7										
	Total Arsenic	µg/L	<	1										
	Total Barium	µg/L		30										
	Total Beryllium	µg/L	<	0.4										
	Total Boron	µg/L		209										
	Total Cadmium	µg/L	<	0.2										
	Total Chromium (III)	µg/L	<	1										
	Hexavalent Chromium	µg/L	<	0.1										
	Total Cobalt	µg/L		2										
	Total Copper	µg/L		25.7849				0.7807						
	Free Cyanide	µg/L		11										
	Total Cyanide	µg/L		30										
	Dissolved Iron	µg/L		103										
	Total Iron	µg/L	<	100										
	Total Lead	µg/L	<	1										
	Total Manganese	µg/L		22										
	Total Mercury	µg/L	<	0.2										
	Total Nickel	µg/L		2										
	Total Phenols (Phenolics) (PWS)	µg/L	<	5										
	Total Selenium	µg/L	<	2										
	Total Silver	µg/L	<	1										
	Total Thallium	µg/L	<	0.4										
	Total Zinc	µg/L		75										
	Total Molybdenum	µg/L		3										
	Acrolein	µg/L	<	1										
	Acrylamide	µg/L	<											
	Acrylonitrile	µg/L	<	0.5										
	Benzene	µg/L	<	0.5										
	Bromoform	µg/L	<	0.5										

Discharge Information 11/2/2022 Page 1

Group 3	Carbon Tetrachloride	µg/L	<	0.5									
	Chlorobenzene	µg/L		0.5									
	Chlorodibromomethane	µg/L	<	0.5									
	Chloroethane	µg/L	<	0.5									
	2-Chloroethyl Vinyl Ether	µg/L	<	0.5									
	Chloroform	µg/L		1.1									
	Dichlorobromomethane	µg/L	<	0.5									
	1,1-Dichloroethane	µg/L	<	0.5									
	1,2-Dichloroethane	µg/L	<	0.5									
	1,1-Dichloroethylene	µg/L	<	0.5									
	1,2-Dichloropropane	µg/L	<	0.5									
	1,3-Dichloropropylene	µg/L	<	0.5									
	1,4-Dioxane	µg/L	<	0.5									
	Ethylbenzene	µg/L	<	0.5									
	Methyl Bromide	µg/L	<	0.5									
	Methyl Chloride	µg/L	<	0.5									
	Methylene Chloride	µg/L	<	0.5									
	1,1,2,2-Tetrachloroethane	µg/L	<	0.5									
	Tetrachloroethylene	µg/L	<	0.5									
	Toluene	µg/L	<	0.5									
	1,2-trans-Dichloroethylene	µg/L	<	0.5									
	1,1,1-Trichloroethane	µg/L	<	0.5									
	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	<	1.02									
	2,4-Dichlorophenol	µg/L	<	1.02									
	2,4-Dimethylphenol	µg/L	<	1.02									
	4,6-Dinitro-o-Cresol	µg/L	<	1.02									
	2,4-Dinitrophenol	µg/L	<	3.06									
	2-Nitrophenol	µg/L	<	1.02									
	4-Nitrophenol	µg/L	<	1.02									
	p-Chloro-m-Cresol	µg/L	<	1.02									
	Pentachlorophenol	µg/L	<	1.02									
	Phenol	µg/L	<	5.1									
	2,4,6-Trichlorophenol	µg/L	<	1.02									
Group 5	Acenaphthene	µg/L	<	1.02									
	Acenaphthylene	µg/L	<	1.02									
	Anthracene	µg/L	<	1.02									
	Benzidine	µg/L	<	5.1									
	Benzo(a)Anthracene	µg/L	<	1.02									
	Benzo(a)Pyrene	µg/L	<	1.02									
	3,4-Benzofluoranthene	µg/L	<	1.02									
	Benzo(ghi)Perylene	µg/L	<	1.02									
	Benzo(k)Fluoranthene	µg/L	<	1.02									
	Bis(2-Chloroethoxy)Methane	µg/L	<	1.02									
	Bis(2-Chloroethyl)Ether	µg/L	<	1.02									
	Bis(2-Chloroisopropyl)Ether	µg/L	<	1.02									
	Bis(2-Ethylhexyl)Phthalate	µg/L	<	3.06									
	4-Bromophenyl Phenyl Ether	µg/L	<	1.02									
	Butyl Benzyl Phthalate	µg/L	<	1.02									
	2-Chloronaphthalene	µg/L	<	1.02									
	4-Chlorophenyl Phenyl Ether	µg/L	<	1.02									
	Chrysene	µg/L	<	1.02									
	Dibenzo(a,h)Anthrancene	µg/L	<	1.02									
	1,2-Dichlorobenzene	µg/L	<	0.5									
	1,3-Dichlorobenzene	µg/L	<	0.5									
	1,4-Dichlorobenzene	µg/L	<	0.5									
	3,3-Dichlorobenzidine	µg/L	<	1.02									
	Diethyl Phthalate	µg/L	<	1.02									
	Dimethyl Phthalate	µg/L	<	1.02									
	Di-n-Butyl Phthalate	µg/L	<	3.06									
	2,4-Dinitrotoluene	µg/L	<	1.02									

	2,6-Dinitrotoluene	µg/L	<	1.02										
	Di-n-Octyl Phthalate	µg/L	<	1.02										
	1,2-Diphenylhydrazine	µg/L	<	1.02										
	Fluoranthene	µg/L	<	1.02										
	Fluorene	µg/L	<	1.02										
	Hexachlorobenzene	µg/L	<	1.02										
	Hexachlorobutadiene	µg/L	<	0.5										
	Hexachlorocyclopentadiene	µg/L	<	1.02										
	Hexachloroethane	µg/L	<	1.02										
	Indeno(1,2,3-cd)Pyrene	µg/L	<	1.02										
	Isophorone	µg/L	<	1.02										
	Naphthalene	µg/L	<	1.02										
	Nitrobenzene	µg/L	<	1.02										
	n-Nitrosodimethylamine	µg/L	<	1.02										
	n-Nitrosodi-n-Propylamine	µg/L	<	1.02										
	n-Nitrosodiphenylamine	µg/L	<	1.02										
	Phenanthrene	µg/L	<	1.02										
	Pyrene	µg/L	<	1.02										
	1,2,4-Trichlorobenzene	µg/L	<	0.5										
Group 6	Aldrin	µg/L	<	0.02										
	alpha-BHC	µg/L	<	0.02										
	beta-BHC	µg/L	<	0.02										
	gamma-BHC	µg/L	<	0.02										
	delta BHC	µg/L	<	0.02										
	Chlordane	µg/L	<	0.5										
	4,4-DDT	µg/L	<	0.02										
	4,4-DDE	µg/L	<	0.02										
	4,4-DDD	µg/L	<	0.02										
	Dieldrin	µg/L	<	0.02										
	alpha-Endosulfan	µg/L	<	0.02										
	beta-Endosulfan	µg/L	<	0.02										
	Endosulfan Sulfate	µg/L	<	0.02										
	Endrin	µg/L	<	0.02										
	Endrin Aldehyde	µg/L	<	0.02										
	Heptachlor	µg/L	<	0.02										
	Heptachlor Epoxide	µg/L	<	0.02										
	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	<	0.5										
	2,3,7,8-TCDD	ng/L	<											
Group 7	Gross Alpha	pCi/L		0.0082										
	Total Beta	pCi/L		10.4										
	Radium 226/228	pCi/L		0.811										
	Total Strontium	µg/L		276										
	Total Uranium	µg/L	<	1										
	Osmotic Pressure	mOs/kg												

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Toxics Management Spreadsheet
Version 1.3, March 2021

Stream / Surface Water Information

Carlisle Regional WWTP, NPDES Permit No. PA0026077, Outfall 001

Instructions | Discharge | *Stream*

Receiving Surface Water Name: **Conodoguinet Creek**

No. Reaches to Model: **1**

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

Location	Stream Code*	RMI*	Elevation (ft)*	DA (mi²)*	Slope (ft/ft)	PWS Withdrawal (MGD)	Apply Fish Criteria*
Point of Discharge	010194	31.99	392	396			Yes
End of Reach 1	010194	27.48	380	428			Yes

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

Location	RMI	LFY (cfs/mi²)*	Flow (cfs)		W/D Ratio	Width (ft)	Depth (ft)	Velocity (fps)	Travel Time (days)	Tributary		Stream		Analysis	
			Stream	Tributary						Hardness	pH	Hardness*	pH*	Hardness	pH
Point of Discharge	31.99	0.147										222	7		
End of Reach 1	27.48	0.147										229			

Q_h

Location	RMI	LFY (cfs/mi²)	Flow (cfs)		W/D Ratio	Width (ft)	Depth (ft)	Velocity (fps)	Travel Time (days)	Tributary		Stream		Analysis	
			Stream	Tributary						Hardness	pH	Hardness	pH	Hardness	pH
Point of Discharge	31.99														
End of Reach 1	27.48														

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Toxics Management Spreadsheet
Version 1.3, March 2021

Model Results

Carlisle Regional WWTP, NPDES Permit No. PA0026077, 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)
31.99	58.21		58.21	10.829	0.0005	1.033	133.889	129.565	0.499	0.552	740.723
27.48	62.92		62.916								

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)
31.99	259.18		259.18	10.829	0.0005	1.883	133.889	71.102	1.071	0.257	390.29
27.48	277.4		277.40								

Wasteload Allocations

AFC CCT (min): 15 PMF: 0.142 Analysis Hardness (mg/l): 292.82 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	1,324	
Total Antimony	0	0		0	1,100	1,100	1,941	
Total Arsenic	0	0		0	340	340	600	Chem Translator of 1 applied
Total Barium	0	0		0	21,000	21,000	37,064	
Total Boron	0	0		0	8,100	8,100	14,296	
Total Cadmium	0	0		0	5.717	6.36	11.2	Chem Translator of 0.899 applied
Total Chromium (III)	0	0		0	1373.549	4,347	7,672	Chem Translator of 0.316 applied
Hexavalent Chromium	0	0		0	16	16.3	28.8	Chem Translator of 0.982 applied
Total Cobalt	0	0		0	95	95.0	168	
Total Copper	0	0		0	36.983	38.5	68.0	Chem Translator of 0.96 applied
Free Cyanide	0	0		0	22	22.0	38.8	

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	203.383	321	566	Chem Translator of 0.634 applied
Total Manganese	0	0		0	N/A	N/A	N/A	
Total Mercury	0	0		0	1.400	1.65	2.91	Chem Translator of 0.85 applied
Total Nickel	0	0		0	1162.017	1,164	2,055	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	20.416	24.0	42.4	Chem Translator of 0.85 applied
Total Thallium	0	0		0	65	65.0	115	
Total Zinc	0	0		0	291.212	298	526	Chem Translator of 0.978 applied
Acrolein	0	0		0	3	3.0	5.29	
Acrylonitrile	0	0		0	650	650	1,147	
Benzene	0	0		0	640	640	1,130	
Bromoform	0	0		0	1,800	1,800	3,177	
Carbon Tetrachloride	0	0		0	2,800	2,800	4,942	
Chlorobenzene	0	0		0	1,200	1,200	2,118	
Chlorodibromomethane	0	0		0	N/A	N/A	N/A	
2-Chloroethyl Vinyl Ether	0	0		0	18,000	18,000	31,769	
Chloroform	0	0		0	1,900	1,900	3,353	
Dichlorobromomethane	0	0		0	N/A	N/A	N/A	
1,2-Dichloroethane	0	0		0	15,000	15,000	26,474	
1,1-Dichloroethylene	0	0		0	7,500	7,500	13,237	
1,2-Dichloropropane	0	0		0	11,000	11,000	19,415	
1,3-Dichloropropylene	0	0		0	310	310	547	
Ethylbenzene	0	0		0	2,900	2,900	5,118	
Methyl Bromide	0	0		0	550	550	971	
Methyl Chloride	0	0		0	28,000	28,000	49,419	
Methylene Chloride	0	0		0	12,000	12,000	21,180	
1,1,2,2-Tetrachloroethane	0	0		0	1,000	1,000	1,765	
Tetrachloroethylene	0	0		0	700	700	1,235	
Toluene	0	0		0	1,700	1,700	3,000	
1,2-trans-Dichloroethylene	0	0		0	6,800	6,800	12,002	
1,1,1-Trichloroethane	0	0		0	3,000	3,000	5,295	
1,1,2-Trichloroethane	0	0		0	3,400	3,400	6,001	
Trichloroethylene	0	0		0	2,300	2,300	4,059	
Vinyl Chloride	0	0		0	N/A	N/A	N/A	
2-Chlorophenol	0	0		0	560	560	988	
2,4-Dichlorophenol	0	0		0	1,700	1,700	3,000	
2,4-Dimethylphenol	0	0		0	660	660	1,165	
4,6-Dinitro-o-Cresol	0	0		0	80	80.0	141	
2,4-Dinitrophenol	0	0		0	660	660	1,165	
2-Nitrophenol	0	0		0	8,000	8,000	14,120	
4-Nitrophenol	0	0		0	2,300	2,300	4,059	
p-Chloro-m-Cresol	0	0		0	160	160	282	
Pentachlorophenol	0	0		0	8.723	8.72	15.4	
Phenol	0	0		0	N/A	N/A	N/A	
2,4,6-Trichlorophenol	0	0		0	460	460	812	

Acenaphthene	0	0		0	83	83.0	146	
Anthracene	0	0		0	N/A	N/A	N/A	
Benzidine	0	0		0	300	300	529	
Benzo(a)Anthracene	0	0		0	0.5	0.5	0.88	
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	52,949	
Bis(2-Chloroisopropyl)Ether	0	0		0	N/A	N/A	N/A	
Bis(2-Ethylhexyl)Phthalate	0	0		0	4,500	4,500	7,942	
4-Bromophenyl Phenyl Ether	0	0		0	270	270	477	
Butyl Benzyl Phthalate	0	0		0	140	140	247	
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	1,447	
1,3-Dichlorobenzene	0	0		0	350	350	618	
1,4-Dichlorobenzene	0	0		0	730	730	1,288	
3,3-Dichlorobenzidine	0	0		0	N/A	N/A	N/A	
Diethyl Phthalate	0	0		0	4,000	4,000	7,060	
Dimethyl Phthalate	0	0		0	2,500	2,500	4,412	
Di-n-Butyl Phthalate	0	0		0	110	110	194	
2,4-Dinitrotoluene	0	0		0	1,600	1,600	2,824	
2,6-Dinitrotoluene	0	0		0	990	990	1,747	
1,2-Diphenylhydrazine	0	0		0	15	15.0	26.5	
Fluoranthene	0	0		0	200	200	353	
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	17.6	
Hexachlorocyclopentadiene	0	0		0	5	5.0	8.82	
Hexachloroethane	0	0		0	60	60.0	106	
Indeno(1,2,3-cd)Pyrene	0	0		0	N/A	N/A	N/A	
Isophorone	0	0		0	10,000	10,000	17,650	
Naphthalene	0	0		0	140	140	247	
Nitrobenzene	0	0		0	4,000	4,000	7,060	
n-Nitrosodimethylamine	0	0		0	17,000	17,000	30,004	
n-Nitrosodi-n-Propylamine	0	0		0	N/A	N/A	N/A	
n-Nitrosodiphenylamine	0	0		0	300	300	529	
Phenanthrene	0	0		0	5	5.0	8.82	
Pyrene	0	0		0	N/A	N/A	N/A	
1,2,4-Trichlorobenzene	0	0		0	130	130	229	
Aldrin	0	0		0	3	3.0	5.29	
alpha-BHC	0	0		0	N/A	N/A	N/A	
beta-BHC	0	0		0	N/A	N/A	N/A	
gamma-BHC	0	0		0	0.95	0.95	1.68	
Chlordane	0	0		0	2.4	2.4	4.24	
4,4-DDT	0	0		0	1.1	1.1	1.94	
4,4-DDE	0	0		0	1.1	1.1	1.94	

4,4-DDD	0	0		0	1.1	1.1	1.94	
Dieldrin	0	0		0	0.24	0.24	0.42	
alpha-Endosulfan	0	0		0	0.22	0.22	0.39	
beta-Endosulfan	0	0		0	0.22	0.22	0.39	
Endosulfan Sulfate	0	0		0	N/A	N/A	N/A	
Endrin	0	0		0	0.086	0.086	0.15	
Endrin Aldehyde	0	0		0	N/A	N/A	N/A	
Heptachlor	0	0		0	0.52	0.52	0.92	
Heptachlor Epoxide	0	0		0	0.5	0.5	0.88	
Toxaphene	0	0		0	0.73	0.73	1.29	
Total Strontium	0	0		0	N/A	N/A	N/A	

☑ ***CFC*** CCT (min): 720 PMF: 0.986 Analysis Hardness (mg/l): 241.84 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	1,386	
Total Arsenic	0	0		0	150	150	945	Chem Translator of 1 applied
Total Barium	0	0		0	4,100	4,100	25,829	
Total Boron	0	0		0	1,600	1,600	10,080	
Total Cadmium	0	0		0	0.454	0.52	3.28	Chem Translator of 0.872 applied
Total Chromium (III)	0	0		0	152.762	178	1,119	Chem Translator of 0.86 applied
Hexavalent Chromium	0	0		0	10	10.4	65.5	Chem Translator of 0.962 applied
Total Cobalt	0	0		0	19	19.0	120	
Total Copper	0	0		0	19.047	19.8	125	Chem Translator of 0.96 applied
Free Cyanide	0	0		0	5.2	5.2	32.8	
Dissolved Iron	0	0		0	N/A	N/A	N/A	
Total Iron	0	0		0	1,500	1,500	9,563	WQC = 30 day average; PMF = 1
Total Lead	0	0		0	6.486	9.79	61.7	Chem Translator of 0.662 applied
Total Manganese	0	0		0	N/A	N/A	N/A	
Total Mercury	0	0		0	0.770	0.91	5.71	Chem Translator of 0.85 applied
Total Nickel	0	0		0	109.781	110	694	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	31.4	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	81.9	
Total Zinc	0	0		0	249.666	253	1,595	Chem Translator of 0.986 applied
Acrolein	0	0		0	3	3.0	18.9	
Acrylonitrile	0	0		0	130	130	819	
Benzene	0	0		0	130	130	819	
Bromoform	0	0		0	370	370	2,331	
Carbon Tetrachloride	0	0		0	560	560	3,528	

Chlorobenzene	0	0		0	240	240	1,512	
Chlorodibromomethane	0	0		0	N/A	N/A	N/A	
2-Chloroethyl Vinyl Ether	0	0		0	3,500	3,500	22,049	
Chloroform	0	0		0	390	390	2,457	
Dichlorobromomethane	0	0		0	N/A	N/A	N/A	
1,2-Dichloroethane	0	0		0	3,100	3,100	19,529	
1,1-Dichloroethylene	0	0		0	1,500	1,500	9,450	
1,2-Dichloropropane	0	0		0	2,200	2,200	13,860	
1,3-Dichloropropylene	0	0		0	61	61.0	384	
Ethylbenzene	0	0		0	580	580	3,654	
Methyl Bromide	0	0		0	110	110	693	
Methyl Chloride	0	0		0	5,500	5,500	34,649	
Methylene Chloride	0	0		0	2,400	2,400	15,120	
1,1,2,2-Tetrachloroethane	0	0		0	210	210	1,323	
Tetrachloroethylene	0	0		0	140	140	882	
Toluene	0	0		0	330	330	2,079	
1,2-trans-Dichloroethylene	0	0		0	1,400	1,400	8,820	
1,1,1-Trichloroethane	0	0		0	610	610	3,843	
1,1,2-Trichloroethane	0	0		0	680	680	4,284	
Trichloroethylene	0	0		0	450	450	2,835	
Vinyl Chloride	0	0		0	N/A	N/A	N/A	
2-Chlorophenol	0	0		0	110	110	693	
2,4-Dichlorophenol	0	0		0	340	340	2,142	
2,4-Dimethylphenol	0	0		0	130	130	819	
4,6-Dinitro-o-Cresol	0	0		0	16	16.0	101	
2,4-Dinitrophenol	0	0		0	130	130	819	
2-Nitrophenol	0	0		0	1,600	1,600	10,080	
4-Nitrophenol	0	0		0	470	470	2,961	
p-Chloro-m-Cresol	0	0		0	500	500	3,150	
Pentachlorophenol	0	0		0	6.693	6.69	42.2	
Phenol	0	0		0	N/A	N/A	N/A	
2,4,6-Trichlorophenol	0	0		0	91	91.0	573	
Acenaphthene	0	0		0	17	17.0	107	
Anthracene	0	0		0	N/A	N/A	N/A	
Benzidine	0	0		0	59	59.0	372	
Benzo(a)Anthracene	0	0		0	0.1	0.1	0.63	
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	37,799	
Bis(2-Chloroisopropyl)Ether	0	0		0	N/A	N/A	N/A	
Bis(2-Ethylhexyl)Phthalate	0	0		0	910	910	5,733	
4-Bromophenyl Phenyl Ether	0	0		0	54	54.0	340	
Butyl Benzyl Phthalate	0	0		0	35	35.0	220	
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	1,008	
1,3-Dichlorobenzene	0	0		0	69	69.0	435	
1,4-Dichlorobenzene	0	0		0	150	150	945	
3,3-Dichlorobenzidine	0	0		0	N/A	N/A	N/A	
Diethyl Phthalate	0	0		0	800	800	5,040	
Dimethyl Phthalate	0	0		0	500	500	3,150	
Di-n-Butyl Phthalate	0	0		0	21	21.0	132	
2,4-Dinitrotoluene	0	0		0	320	320	2,016	
2,6-Dinitrotoluene	0	0		0	200	200	1,260	
1,2-Diphenylhydrazine	0	0		0	3	3.0	18.9	
Fluoranthene	0	0		0	40	40.0	252	
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	12.6	
Hexachlorocyclopentadiene	0	0		0	1	1.0	6.3	
Hexachloroethane	0	0		0	12	12.0	75.6	
Indeno(1,2,3-cd)Pyrene	0	0		0	N/A	N/A	N/A	
Isophorone	0	0		0	2,100	2,100	13,230	
Naphthalene	0	0		0	43	43.0	271	
Nitrobenzene	0	0		0	810	810	5,103	
n-Nitrosodimethylamine	0	0		0	3,400	3,400	21,419	
n-Nitrosodi-n-Propylamine	0	0		0	N/A	N/A	N/A	
n-Nitrosodiphenylamine	0	0		0	59	59.0	372	
Phenanthrene	0	0		0	1	1.0	6.3	
Pyrene	0	0		0	N/A	N/A	N/A	
1,2,4-Trichlorobenzene	0	0		0	26	26.0	164	
Aldrin	0	0		0	0.1	0.1	0.63	
alpha-BHC	0	0		0	N/A	N/A	N/A	
beta-BHC	0	0		0	N/A	N/A	N/A	
gamma-BHC	0	0		0	N/A	N/A	N/A	
Chlordane	0	0		0	0.0043	0.004	0.027	
4,4-DDT	0	0		0	0.001	0.001	0.006	
4,4-DDE	0	0		0	0.001	0.001	0.006	
4,4-DDD	0	0		0	0.001	0.001	0.006	
Dieldrin	0	0		0	0.056	0.056	0.35	
alpha-Endosulfan	0	0		0	0.056	0.056	0.35	
beta-Endosulfan	0	0		0	0.056	0.056	0.35	
Endosulfan Sulfate	0	0		0	N/A	N/A	N/A	
Endrin	0	0		0	0.036	0.036	0.23	
Endrin Aldehyde	0	0		0	N/A	N/A	N/A	
Heptachlor	0	0		0	0.0038	0.004	0.024	
Heptachlor Epoxide	0	0		0	0.0038	0.004	0.024	
Toxaphene	0	0		0	0.0002	0.0002	0.001	

Total Strontium	0	0		0	N/A	N/A	N/A	

[✓] **THH** CCT (min): 720 PMF: 0.986 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	35.3	
Total Arsenic	0	0		0	10	10.0	63.0	
Total Barium	0	0		0	2,400	2,400	15,120	
Total Boron	0	0		0	3,100	3,100	19,529	
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	25.2	
Dissolved Iron	0	0		0	300	300	1,890	
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	6,300	
Total Mercury	0	0		0	0.050	0.05	0.31	
Total Nickel	0	0		0	610	610	3,843	
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	1.51	
Total Zinc	0	0		0	N/A	N/A	N/A	
Acrolein	0	0		0	3	3.0	18.9	
Acrylonitrile	0	0		0	N/A	N/A	N/A	
Benzene	0	0		0	N/A	N/A	N/A	
Bromoform	0	0		0	N/A	N/A	N/A	
Carbon Tetrachloride	0	0		0	N/A	N/A	N/A	
Chlorobenzene	0	0		0	100	100.0	630	
Chlorodibromomethane	0	0		0	N/A	N/A	N/A	
2-Chloroethyl Vinyl Ether	0	0		0	N/A	N/A	N/A	
Chloroform	0	0		0	5.7	5.7	35.9	
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	208	
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	428	
Methyl Bromide	0	0		0	100	100.0	630	
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	359	
1,2-trans-Dichloroethylene	0	0		0	100	100.0	630	
1,1,1-Trichloroethane	0	0		0	10,000	10,000	62,998	
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	189	
2,4-Dichlorophenol	0	0		0	10	10.0	63.0	
2,4-Dimethylphenol	0	0		0	100	100.0	630	
4,6-Dinitro-o-Cresol	0	0		0	2	2.0	12.6	
2,4-Dinitrophenol	0	0		0	10	10.0	63.0	
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	25,199	
2,4,6-Trichlorophenol	0	0		0	N/A	N/A	N/A	
Acenaphthene	0	0		0	70	70.0	441	
Anthracene	0	0		0	300	300	1,890	
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	1,260	
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	0.63	
2-Chloronaphthalene	0	0		0	800	800	5,040	
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	6,300	
1,3-Dichlorobenzene	0	0		0	7	7.0	44.1	
1,4-Dichlorobenzene	0	0		0	300	300	1,890	
3,3-Dichlorobenzidine	0	0		0	N/A	N/A	N/A	
Diethyl Phthalate	0	0		0	600	600	3,780	
Dimethyl Phthalate	0	0		0	2,000	2,000	12,600	
Di-n-Butyl Phthalate	0	0		0	20	20.0	126	

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	126	
Fluorene	0	0		0	50	50.0	315	
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	25.2	
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	214	
Naphthalene	0	0		0	N/A	N/A	N/A	
Nitrobenzene	0	0		0	10	10.0	63.0	
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	126	
1,2,4-Trichlorobenzene	0	0		0	0.07	0.07	0.44	
Aldrin	0	0		0	N/A	N/A	N/A	
alpha-BHC	0	0		0	N/A	N/A	N/A	
beta-BHC	0	0		0	N/A	N/A	N/A	
gamma-BHC	0	0		0	4.2	4.2	26.5	
Chlordane	0	0		0	N/A	N/A	N/A	
4,4-DDT	0	0		0	N/A	N/A	N/A	
4,4-DDE	0	0		0	N/A	N/A	N/A	
4,4-DDD	0	0		0	N/A	N/A	N/A	
Dieldrin	0	0		0	N/A	N/A	N/A	
alpha-Endosulfan	0	0		0	20	20.0	126	
beta-Endosulfan	0	0		0	20	20.0	126	
Endosulfan Sulfate	0	0		0	20	20.0	126	
Endrin	0	0		0	0.03	0.03	0.19	
Endrin Aldehyde	0	0		0	1	1.0	6.3	
Heptachlor	0	0		0	N/A	N/A	N/A	
Heptachlor Epoxide	0	0		0	N/A	N/A	N/A	
Toxaphene	0	0		0	N/A	N/A	N/A	
Total Strontium	0	0		0	4,000	4,000	25,199	

[✓] ***CRL*** CCT (min): ###### 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	1.5	
Benzene	0	0		0	0.58	0.58	14.5	
Bromoform	0	0		0	7	7.0	175	
Carbon Tetrachloride	0	0		0	0.4	0.4	9.97	
Chlorobenzene	0	0		0	N/A	N/A	N/A	
Chlorodibromomethane	0	0		0	0.8	0.8	19.9	
2-Chloroethyl Vinyl Ether	0	0		0	N/A	N/A	N/A	
Chloroform	0	0		0	N/A	N/A	N/A	
Dichlorobromomethane	0	0		0	0.95	0.95	23.7	
1,2-Dichloroethane	0	0		0	9.9	9.9	247	
1,1-Dichloroethylene	0	0		0	N/A	N/A	N/A	
1,2-Dichloropropane	0	0		0	0.9	0.9	22.4	
1,3-Dichloropropylene	0	0		0	0.27	0.27	6.73	
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	499	
1,1,2,2-Tetrachloroethane	0	0		0	0.2	0.2	4.99	
Tetrachloroethylene	0	0		0	10	10.0	249	
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	13.7	
Trichloroethylene	0	0		0	0.6	0.6	15.0	
Vinyl Chloride	0	0		0	0.02	0.02	0.5	
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	0.75	
Phenol	0	0		0	N/A	N/A	N/A	
2,4,6-Trichlorophenol	0	0		0	1.5	1.5	37.4	
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	0.002	
Benzo(a)Anthracene	0	0		0	0.001	0.001	0.025	
Benzo(a)Pyrene	0	0		0	0.0001	0.0001	0.002	
3,4-Benzofluoranthene	0	0		0	0.001	0.001	0.025	
Benzo(k)Fluoranthene	0	0		0	0.01	0.01	0.25	
Bis(2-Chloroethyl)Ether	0	0		0	0.03	0.03	0.75	
Bis(2-Chloroisopropyl)Ether	0	0		0	N/A	N/A	N/A	
Bis(2-Ethylhexyl)Phthalate	0	0		0	0.32	0.32	7.98	
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	2.99	
Dibenzo(a,h)Anthrancene	0	0		0	0.0001	0.0001	0.002	
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	1.25	
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	1.25	
2,6-Dinitrotoluene	0	0		0	0.05	0.05	1.25	
1,2-Diphenylhydrazine	0	0		0	0.03	0.03	0.75	
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	0.002	
Hexachlorobutadiene	0	0		0	0.01	0.01	0.25	
Hexachlorocyclopentadiene	0	0		0	N/A	N/A	N/A	
Hexachloroethane	0	0		0	0.1	0.1	2.49	

Indeno(1,2,3-cd)Pyrene	0	0		0	0.001	0.001	0.025	
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	0.017	
n-Nitrosodi-n-Propylamine	0	0		0	0.005	0.005	0.12	
n-Nitrosodiphenylamine	0	0		0	3.3	3.3	82.3	
Phenanthrene	0	0		0	N/A	N/A	N/A	
Pyrene	0	0		0	N/A	N/A	N/A	
1,2,4-Trichlorobenzene	0	0		0	N/A	N/A	N/A	
Aldrin	0	0		0	0.0000008	8.00E-07	0.00002	
alpha-BHC	0	0		0	0.0004	0.0004	0.01	
beta-BHC	0	0		0	0.008	0.008	0.2	
gamma-BHC	0	0		0	N/A	N/A	N/A	
Chlordane	0	0		0	0.0003	0.0003	0.007	
4,4-DDT	0	0		0	0.00003	0.00003	0.0007	
4,4-DDE	0	0		0	0.00002	0.00002	0.0005	
4,4-DDD	0	0		0	0.0001	0.0001	0.002	
Dieldrin	0	0		0	0.000001	0.000001	0.00002	
alpha-Endosulfan	0	0		0	N/A	N/A	N/A	
beta-Endosulfan	0	0		0	N/A	N/A	N/A	
Endosulfan Sulfate	0	0		0	N/A	N/A	N/A	
Endrin	0	0		0	N/A	N/A	N/A	
Endrin Aldehyde	0	0		0	N/A	N/A	N/A	
Heptachlor	0	0		0	0.000006	0.000006	0.0001	
Heptachlor Epoxide	0	0		0	0.00003	0.00003	0.0007	
Toxaphene	0	0		0	0.0007	0.0007	0.017	
Total Strontium	0	0		0	N/A	N/A	N/A	

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

No. Samples/Month: 4

	Mass Limits		*Concentration Limits*						
Pollutants	AML (lbs/day)	MDL (lbs/day)	AML	MDL	IMAX	Units	Governing WQBEL	WQBEL Basis	Comments
Total Copper	Report	Report	Report	Report	Report	µg/L	56.7	AFC	Discharge Conc > 10% WQBEL (no RP)
Free Cyanide	Report	Report	Report	Report	Report	µg/L	24.9	AFC	Discharge Conc > 25% WQBEL (no RP)
Total Zinc	Report	Report	Report	Report	Report	µg/L	337	AFC	Discharge Conc > 10% WQBEL (no RP)

☑ ***Other Pollutants without Limits or Monitoring***

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

Pollutants	Governing WQBEL	Units	Comments
Total Dissolved Solids (PWS)	N/A	N/A	PWS Not Applicable
Chloride (PWS)	N/A	N/A	PWS Not Applicable
Bromide	N/A	N/A	No WQS
Sulfate (PWS)	N/A	N/A	PWS Not Applicable
Total Aluminum	N/A	N/A	Discharge Conc < TQL
Total Antimony	35.3	µg/L	Discharge Conc ≤ 10% WQBEL
Total Arsenic	N/A	N/A	Discharge Conc < TQL
Total Barium	15,120	µg/L	Discharge Conc ≤ 10% WQBEL
Total Beryllium	N/A	N/A	No WQS
Total Boron	9,163	µg/L	Discharge Conc ≤ 10% WQBEL
Total Cadmium	3.28	µg/L	Discharge Conc < TQL
Total Chromium (III)	1,119	µg/L	Discharge Conc < TQL
Hexavalent Chromium	18.4	µg/L	Discharge Conc < TQL
Total Cobalt	107	µg/L	Discharge Conc ≤ 10% WQBEL
Total Cyanide	N/A	N/A	No WQS
Dissolved Iron	1,890	µg/L	Discharge Conc ≤ 10% WQBEL
Total Iron	9,563	µg/L	Discharge Conc ≤ 10% WQBEL
Total Lead	61.7	µg/L	Discharge Conc < TQL
Total Manganese	6,300	µg/L	Discharge Conc ≤ 10% WQBEL
Total Mercury	0.31	µg/L	Discharge Conc < TQL
Total Nickel	694	µg/L	Discharge Conc ≤ 10% WQBEL
Total Phenols (Phenolics) (PWS)		µg/L	Discharge Conc < TQL
Total Selenium	31.4	µg/L	Discharge Conc < TQL
Total Silver	27.2	µg/L	Discharge Conc ≤ 10% WQBEL
Total Thallium	1.51	µg/L	Discharge Conc < TQL
Total Molybdenum	N/A	N/A	No WQS
Acrolein	3.39	µg/L	Discharge Conc < TQL
Acrylonitrile	1.5	µg/L	Discharge Conc < TQL
Benzene	14.5	µg/L	Discharge Conc < TQL
Bromoform	175	µg/L	Discharge Conc < TQL
Carbon Tetrachloride	9.97	µg/L	Discharge Conc < TQL
Chlorobenzene	630	µg/L	Discharge Conc ≤ 25% WQBEL
Chlorodibromomethane	19.9	µg/L	Discharge Conc < TQL
Chloroethane	N/A	N/A	No WQS
2-Chloroethyl Vinyl Ether	20,363	µg/L	Discharge Conc < TQL
Chloroform	35.9	µg/L	Discharge Conc ≤ 25% WQBEL
Dichlorobromomethane	23.7	µg/L	Discharge Conc < TQL
1,1-Dichloroethane	N/A	N/A	No WQS
1,2-Dichloroethane	247	µg/L	Discharge Conc < TQL
1,1-Dichloroethylene	208	µg/L	Discharge Conc < TQL

1,2-Dichloropropane	22.4	µg/L	Discharge Conc < TQL
1,3-Dichloropropylene	6.73	µg/L	Discharge Conc < TQL
1,4-Dioxane	N/A	N/A	No WQS
Ethylbenzene	428	µg/L	Discharge Conc < TQL
Methyl Bromide	622	µg/L	Discharge Conc < TQL
Methyl Chloride	31,676	µg/L	Discharge Conc < TQL
Methylene Chloride	499	µg/L	Discharge Conc < TQL
1,1,2,2-Tetrachloroethane	4.99	µg/L	Discharge Conc < TQL
Tetrachloroethylene	249	µg/L	Discharge Conc < TQL
Toluene	359	µg/L	Discharge Conc < TQL
1,2-trans-Dichloroethylene	630	µg/L	Discharge Conc < TQL
1,1,1-Trichloroethane	3,394	µg/L	Discharge Conc < TQL
1,1,2-Trichloroethane	13.7	µg/L	Discharge Conc < TQL
Trichloroethylene	15.0	µg/L	Discharge Conc < TQL
Vinyl Chloride	0.5	µg/L	Discharge Conc < TQL
2-Chlorophenol	189	µg/L	Discharge Conc < TQL
2,4-Dichlorophenol	63.0	µg/L	Discharge Conc < TQL
2,4-Dimethylphenol	630	µg/L	Discharge Conc < TQL
4,6-Dinitro-o-Cresol	12.6	µg/L	Discharge Conc < TQL
2,4-Dinitrophenol	63.0	µg/L	Discharge Conc < TQL
2-Nitrophenol	9,050	µg/L	Discharge Conc < TQL
4-Nitrophenol	2,602	µg/L	Discharge Conc < TQL
p-Chloro-m-Cresol	181	µg/L	Discharge Conc < TQL
Pentachlorophenol	0.75	µg/L	Discharge Conc < TQL
Phenol	25,199	µg/L	Discharge Conc < TQL
2,4,6-Trichlorophenol	37.4	µg/L	Discharge Conc < TQL
Acenaphthene	93.9	µg/L	Discharge Conc < TQL
Acenaphthylene	N/A	N/A	No WQS
Anthracene	1,890	µg/L	Discharge Conc < TQL
Benzidine	0.002	µg/L	Discharge Conc < TQL
Benzo(a)Anthracene	0.025	µg/L	Discharge Conc < TQL
Benzo(a)Pyrene	0.002	µg/L	Discharge Conc < TQL
3,4-Benzofluoranthene	0.025	µg/L	Discharge Conc < TQL
Benzo(ghi)Perylene	N/A	N/A	No WQS
Benzo(k)Fluoranthene	0.25	µg/L	Discharge Conc < TQL
Bis(2-Chloroethoxy)Methane	N/A	N/A	No WQS
Bis(2-Chloroethyl)Ether	0.75	µg/L	Discharge Conc < TQL
Bis(2-Chloroisopropyl)Ether	1,260	µg/L	Discharge Conc < TQL
Bis(2-Ethylhexyl)Phthalate	7.98	µg/L	Discharge Conc < TQL
4-Bromophenyl Phenyl Ether	305	µg/L	Discharge Conc < TQL
Butyl Benzyl Phthalate	0.63	µg/L	Discharge Conc < TQL
2-Chloronaphthalene	5,040	µg/L	Discharge Conc < TQL
4-Chlorophenyl Phenyl Ether	N/A	N/A	No WQS
Chrysene	2.99	µg/L	Discharge Conc < TQL
Dibenzo(a,h)Anthrancene	0.002	µg/L	Discharge Conc < TQL

1,2-Dichlorobenzene	928	µg/L	Discharge Conc < TQL
1,3-Dichlorobenzene	44.1	µg/L	Discharge Conc < TQL
1,4-Dichlorobenzene	826	µg/L	Discharge Conc < TQL
3,3-Dichlorobenzidine	1.25	µg/L	Discharge Conc < TQL
Diethyl Phthalate	3,780	µg/L	Discharge Conc < TQL
Dimethyl Phthalate	2,828	µg/L	Discharge Conc < TQL
Di-n-Butyl Phthalate	124	µg/L	Discharge Conc < TQL
2,4-Dinitrotoluene	1.25	µg/L	Discharge Conc < TQL
2,6-Dinitrotoluene	1.25	µg/L	Discharge Conc < TQL
Di-n-Octyl Phthalate	N/A	N/A	No WQS
1,2-Diphenylhydrazine	0.75	µg/L	Discharge Conc < TQL
Fluoranthene	126	µg/L	Discharge Conc < TQL
Fluorene	315	µg/L	Discharge Conc < TQL
Hexachlorobenzene	0.002	µg/L	Discharge Conc < TQL
Hexachlorobutadiene	0.25	µg/L	Discharge Conc < TQL
Hexachlorocyclopentadiene	5.66	µg/L	Discharge Conc < TQL
Hexachloroethane	2.49	µg/L	Discharge Conc < TQL
Indeno(1,2,3-cd)Pyrene	0.025	µg/L	Discharge Conc < TQL
Isophorone	214	µg/L	Discharge Conc < TQL
Naphthalene	158	µg/L	Discharge Conc ≤ 25% WQBEL
Nitrobenzene	63.0	µg/L	Discharge Conc < TQL
n-Nitrosodimethylamine	0.017	µg/L	Discharge Conc < TQL
n-Nitrosodi-n-Propylamine	0.12	µg/L	Discharge Conc < TQL
n-Nitrosodiphenylamine	82.3	µg/L	Discharge Conc < TQL
Phenanthrene	5.66	µg/L	Discharge Conc < TQL
Pyrene	126	µg/L	Discharge Conc < TQL
1,2,4-Trichlorobenzene	0.44	µg/L	Discharge Conc < TQL
Aldrin	0.00002	µg/L	Discharge Conc < TQL
alpha-BHC	0.01	µg/L	Discharge Conc < TQL
beta-BHC	0.2	µg/L	Discharge Conc < TQL
gamma-BHC	1.07	µg/L	Discharge Conc < TQL
delta BHC	N/A	N/A	No WQS
Chlordane	0.007	µg/L	Discharge Conc < TQL
4,4-DDT	0.0007	µg/L	Discharge Conc < TQL
4,4-DDE	0.0005	µg/L	Discharge Conc < TQL
4,4-DDD	0.002	µg/L	Discharge Conc < TQL
Dieldrin	0.00002	µg/L	Discharge Conc < TQL
alpha-Endosulfan	0.25	µg/L	Discharge Conc < TQL
beta-Endosulfan	0.25	µg/L	Discharge Conc < TQL
Endosulfan Sulfate	126	µg/L	Discharge Conc < TQL
Endrin	0.097	µg/L	Discharge Conc < TQL
Endrin Aldehyde	6.3	µg/L	Discharge Conc < TQL
Heptachlor	0.0001	µg/L	Discharge Conc < TQL
Heptachlor Epoxide	0.0007	µg/L	Discharge Conc < TQL
Toxaphene	0.001	µg/L	Discharge Conc < TQL

Gross Alpha	N/A	N/A	No WQS
Total Beta	N/A	N/A	No WQS
Radium 226/228	N/A	N/A	No WQS
Total Strontium	25,199	µg/L	Discharge Conc ≤ 10% WQBEL
Total Uranium	N/A	N/A	No WQS

4. TOXCON Spreadsheet

	Facility:	Carlisle Regional WWTP		
	NPDES #:	PA0026077		
	Outfall No:	001		
	n (Samples/Month):	4		
	Reviewer/Permit Engineer:	Jinsu Kim		
Parameter Name	Hardness (effluent	Hardness (instrean	Hardness (downstre	Total Copper
Units	mg/L	mg/L	mg/L	mg/L
Detection Limit				
Sample Date	*When entering values below the detection limit, enter "ND" or use the < notation (eg. <0.02)*			
Nov-17	255	152		0.0064
Dec-17	283	174		0.01
Jan-18	296	243		0.027
Feb-18	392	164		0.017
Mar-18	322	190		0.012
Apr-18	145	145		0.016
May-18	309	160	153	0.081
Jun-18	316	190	180	0.008
Jul-18	298	215	234	0.007
Aug-18	298	170	187	0.0048
Sep-18	311	183	203	0.0074
Oct-18	296	190	175	0.0069
Nov-18	320	137	145	0.0073
Dec-18	162	174	162	0.0052
Jan-19	319	172	172	0.0065
Feb-19	318	180	161	0.0073
Mar-19	324	151	156	0.0045
Apr-19	312	175	175	0.0046
May-19	230	136	136	0.0038
Jun-19	335	182	217	0.005
Jul-19	313	216	252	0.024
Aug-19	310	215	244	0.0056
Sep-19	322	236	241	0.0072
Oct-19	325	254	246	0.0051
Nov-19	312	215	203	0.0087
Dec-19	285	172	181	0.0078
Jan-20	288	166	148	0.0059
Feb-20	250	168	150	0.0072
Mar-20	297	177	175	0.0073
Apr-20	265	131	142	0.0072
May-20	298	190	175	0.0061
Jun-20	302	194	195	0.0091
Jul-20	312	186	200	0.0095
Aug-20	305	218	213	0.0072
Sep-20	338	222	242	0.0115
Oct-20	326	222	235	0.0078
Nov-20	304	209	193	0.0081
Dec-20	291	178	177	0.0078
Jan-21	263	197	207	0.007
Feb-21	267	195	212	0.0078
Mar-21	299	169	174	0.032
Apr-21	274	158	160	0.0053
May-21	260	204	196	0.006
Jun-21	280	217	216	0.0057
Jul-21	292	190	204	0.07
Aug-21	263	218	200	0.0058
Sep-21	263	194	194	0.0064
Oct-21	311	229	233	0.00513
Nov-21	276	197	182	0.0065

Parameter Name	Hardness (effluent	Hardness (instrean	Hardness (downstre	Total Copper
Units	mg/L	mg/L	mg/L	mg/L
Detection Limit				
Sample Date	*When entering values below the detection limit, enter "ND" or use the < notation (eg. <0.0*			
Dec-21	286	211	214	0.0086
Jan-22	286	168	171	0.0083
Feb-22	275	205	200	0.011
Mar-22	275	168	149	0.0089
Apr-22	234	166	158	0.015
May-22	276	178	170	0.015
				0.11

		Reviewer/Permit Engineer:	Jinsu Kim
Facility:	Carlisle Regional WWTP		
NPDES #:	PA0026077		
Outfall No:	001		
n (Samples/Month):	4		
Parameter	**Distribution Applied**	**Coefficient of Variation (daily)**	**Avg. Monthly**
Hardness (effluent) (mg/L	Lognormal	0.1564773	347.5500501
lardness (instream) (mg/L	Lognormal	0.1489805	222.4456507
rdness (downstream) (mg	Lognormal	0.1644038	229.2038563
Total Copper (mg/L)	Lognormal	0.7807094	0.0257849

	Facility:		Carlisle Regional WWTP	
	NPDES #:		PA0026077	
	Outfall No:		001	
	n (Samples/Month):		4	
Parameter Name	Hardness (effluent	Hardness (instrean	rdness (downstrea	Total Copper
Number of Samples	55	55	49	56
Samples Nondetected	0	0	0	0
LOGNORMAL				
Log MEAN	5.6601593	5.2234487	5.2337643	-4.7009854
Log VAR.	0.0241902	0.0219525	0.0266698	0.4759280
(LTA) [E(x)]	290.6891335	187.6211714	190.0142782	0.0115275
Variance [V(x)]	2069.0000496	781.3081297	975.8794873	0.0000810
CV (raw)	0.1564773	0.1489805	0.1644038	0.7807094
CV (n)	0.0782387	0.0744902	0.0822019	0.3903547
Monthly Avg. (99%, n-day)	347.5500501	222.4456507	229.2038563	0.0257849
DELTA-LOGNORMAL				
Delta-Log MEAN	NA	NA	NA	NA
Delta-Log VAR.				
(LTA) [E(x)]				
Variance [V(x)]				
CV (raw)				
Delta-Log VAR. (n)				
A, Table E-2, TSD				
B, Table E-2, TSD				
C, Table E-2, TSD				
Delta-Log MEAN (n)				
phi (Φ)				
Z*				
Monthly Avg. (99%, n-day)				
NORMAL				
MEAN	NA	NA	NA	NA
VAR.				
(LTA) [E(x)]				
Variance [V(x)]				
CV (raw)				
CV (n)				
Monthly Avg. (99%, n-day)				

5. WET Analysis Spreadsheet

DEP Whole Effluent Toxicity (WET) Analysis Spreadsheet

Type of Test	Chronic
Species Tested	Ceriodaphnia
Endpoint	Survival
TIWC (decimal)	0.18
No. Per Replicate	1
TST b value	0.75
TST alpha value	0.2

Facility Name: Carlisle Regional WWTP

Permit No.: PA0026077

Test Completion Date: 2/15/2022

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

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

Test Completion Date: 5/25/2021

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: 6/8/2020

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

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

Test Completion Date: 7/30/2019

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

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

DEP Whole Effluent Toxicity (WET) Analysis Spreadsheet

Type of Test	Chronic
Species Tested	Ceriodaphnia
Endpoint	Reproduction
TIWC (decimal)	0.18
No. Per Replicate	1
TST b value	0.75
TST alpha value	0.2

Facility Name: Carlisle Regional WWTP

Permit No.: PA0026077

Test Completion Date: 2/15/2022

Replicate No.	Control	TIWC
1	22	28
2	30	31
3	30	25
4	28	29
5	31	27
6	37	28
7	34	37
8	37	27
9	34	36
10	29	39
11		
12		
13		
14		
15		
Mean	31.200	30.700
Std Dev.	4.541	4.877
# Replicates	10	10

T-Test Result	3.8805
Deg. of Freedom	16
Critical T Value	0.8647
Pass or Fail	PASS

Test Completion Date: 5/24/2021

Replicate No.	Control	TIWC
1	35	38
2	35	40
3	37	37
4	39	43
5	36	41
6	43	45
7	36	40
8	40	40
9	40	38
10	41	45
11		
12		
13		
14		
15		
Mean	38.200	40.700
Std Dev.	2.781	2.830
# Replicates	10	10

T-Test Result	10.8382
Deg. of Freedom	16
Critical T Value	0.8647
Pass or Fail	PASS

Test Completion Date: 6/8/2020

Replicate No.	Control	TIWC
1	31	21
2	10	28
3	20	26
4	19	37
5	26	25
6	32	9
7	17	39
8	32	38
9	15	32
10	31	32
11		
12		
13		
14		
15		
Mean	23.300	28.700
Std Dev.	8.111	9.141
# Replicates	10	10

T-Test Result	3.2327
Deg. of Freedom	16
Critical T Value	0.8647
Pass or Fail	PASS

Test Completion Date: 7/30/2019

Replicate No.	Control	TIWC
1	39	36
2	46	37
3	43	42
4	42	35
5	40	45
6	38	37
7	42	44
8	40	37
9	35	41
10	23	38
11		
12		
13		
14		
15		
Mean	38.800	39.200
Std Dev.	6.303	3.521
# Replicates	10	10

T-Test Result	5.4181
Deg. of Freedom	17
Critical T Value	0.8633
Pass or Fail	PASS

DEP Whole Effluent Toxicity (WET) Analysis Spreadsheet

Type of Test	Chronic
Species Tested	Pimephales
Endpoint	Survival
TIWC (decimal)	0.18
No. Per Replicate	10
TST b value	0.75
TST alpha value	0.25

Facility Name: Carlisle Regional WWTP

Permit No.: PA0026077

Test Completion Date: 4/19/2022

Replicate No.	Control	TIWC
1	10	9
2	8	10
3	10	10
4	9	10
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
Mean	9.250	9.750
Std Dev.	0.957	0.500
# Replicates	4	4

T-Test Result	5.8363
Deg. of Freedom	5
Critical T Value	0.7267
Pass or Fail	PASS

Test Completion Date: 5/25/2021

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

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

Test Completion Date: 6/9/2020

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

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

Test Completion Date: 7/30/2019

Replicate No.	Control	TIWC
1	10	9
2	10	10
3	10	10
4	10	9
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
Mean	10.000	9.500
Std Dev.	0.000	0.577
# Replicates	4	4

T-Test Result	5.7714
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)	0.18
No. Per Replicate	10
TST b value	0.75
TST alpha value	0.25

Facility Name: Carlisle Regional WWTP

Permit No.: PA0026077

Test Completion Date: 4/19/2022

Replicate No.	Control	TIWC
1	0.678	0.7
2	0.606	0.692
3	0.726	0.669
4	0.633	0.755
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
Mean	0.661	0.704
Std Dev.	0.053	0.036
# Replicates	4	4

T-Test Result	7.7557
Deg. of Freedom	5
Critical T Value	0.7267
Pass or Fail	PASS

Test Completion Date: 5/25/2021

Replicate No.	Control	TIWC
1	0.651	0.672
2	0.591	0.586
3	0.525	0.59
4	0.563	0.553
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
Mean	0.583	0.600
Std Dev.	0.053	0.051
# Replicates	4	4

T-Test Result	5.0737
Deg. of Freedom	5
Critical T Value	0.7267
Pass or Fail	PASS

Test Completion Date:

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

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

Test Completion Date: 7/30/2019

Replicate No.	Control	TIWC
1	0.676	0.542
2	0.578	0.67
3	0.683	0.547
4	0.581	0.624
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
Mean	0.630	0.596
Std Dev.	0.058	0.062
# Replicates	4	4

T-Test Result	3.2637
Deg. of Freedom	5
Critical T Value	0.7267
Pass or Fail	PASS

WET Summary and Evaluation

Facility Name	Carlisle Regional WWTP
Permit No.	PA0026077
Design Flow (MGD)	7
Q_{7-10} Flow (cfs)	58.212
PMF_a	0.142
PMF_c	0.986

		Test Results (Pass/Fail)			
		Test Date	Test Date	Test Date	Test Date
Species	**Endpoint**	2/15/22	5/25/21	6/8/20	7/30/19
Ceriodaphnia	Survival	PASS	PASS	PASS	PASS

		Test Results (Pass/Fail)			
		Test Date	Test Date	Test Date	Test Date
Species	**Endpoint**	2/15/22	5/24/21	6/8/20	7/30/19
Ceriodaphnia	Reproduction	PASS	PASS	PASS	PASS

		Test Results (Pass/Fail)			
		Test Date	Test Date	Test Date	Test Date
Species	**Endpoint**	4/19/22	5/25/21	6/9/20	7/30/19
Pimephales	Survival	PASS	PASS	PASS	PASS

		Test Results (Pass/Fail)			
		Test Date	Test Date	Test Date	Test Date
Species	**Endpoint**	4/19/22	5/25/21		7/30/19
Pimephales	Growth	PASS	PASS		PASS

Reasonable Potential? NO

Permit Recommendations

Test Type	**Chronic**	
TIWC	**16**	% Effluent
Dilution Series	**4, 8, 16, 58, 100**	% Effluent
Permit Limit	**None**	
Permit Limit Species		

DEP Whole Effluent Toxicity

Type of Test	Chronic
Species Tested	Pimephales
Endpoint	Survival
TIWC (decimal)	0.18
No. Per Replicate	10
TST b value	0.75
TST alpha value	0.25

Replicate No.	Test Completion Date 2/15/2022 Control	TIWC
1	9	10
2	9	6
3	9	8
4	9	6
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
Mean	9.000	7.500
Std Dev.	0.000	1.915
# Replicates	4	4

T-Test Result	1.0928
Deg. of Freedom	3
Critical T Value	0.7649
Pass or Fail	PASS

DEP Whole Effluent Toxicity

Type of Test	Chronic
Species Tested	Pimephales
Endpoint	Growth
TIWC (decimal)	0.18
No. Per Replicate	10
TST b value	0.75
TST alpha value	0.25

Replicate No.	Test Completion Date 2/15/2022 Control	TIWC
1	0.382	0.399
2	0.45	0.322
3	0.433	0.369
4	0.458	0.275
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
Mean	0.431	0.341
Std Dev.	0.034	0.054
# Replicates	4	4

T-Test Result	0.6054
Deg. of Freedom	4
Critical T Value	0.7407
Pass or Fail	FAIL