pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Southwest Regional Office
CLEAN WATER PROGRAM

Application Type	**Renewal**	Application No.	**PA0044679**
Facility Type	**Municipal**	APS ID	**661736**
Major / Minor	**Major**	Authorization ID	**1206078**

NPDES PERMIT FACT SHEET
INDIVIDUAL SEWAGE

Applicant and Facility Information

Applicant Name	**Pigeon Creek Sanitary Authority**	Facility Name	**Pigeon Creek**
Applicant Address	508 Main Street	Facility Address	831 Bentleyville Road
	Bentleyville, PA 15314-1537		Charleroi, PA 15022-3446
Applicant Contact	John Kadash	Facility Contact	
Applicant Phone		Facility Phone	(724) 239-2713
Client ID	43678	Site ID	4618
Ch 94 Load Status	Not Overloaded	Municipality	Fallowfield Township
Connection Status	Dept. Imposed Connection Prohibitions	County	Washington
Date Application Received	October 30, 2017	EPA Waived?	No
Date Application Accepted	November 8, 2017	If No, Reason	Major Facility

Purpose of Application: Renewal application for the discharge of treated sewage

Summary of Review

This review is in response to a renewal application received on October 30, 2017. The permit was set to expire on October 31, 2017 so the submission was late. Additionally, the renewal application was incomplete since it did not include analytical data or WET sampling results. The analytical data and WET test results were submitted on April 19, 2018. The Pigeon Creek Sanitary Authority owns and operates a sewage treatment plant in Fallowfield Township, Washington County. Sewage from the Borough of Bentleyville, the Borough of Ellsworth, the Borough of Cokeburg, Somerset Township, North Bethlehem Township, and Fallowfield Township is treated at the Pigeon Creek plant with comminution, screening, aeration, clarification and chlorine disinfection before discharging to Pigeon Creek through outfall 001.

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		James M. Vanek James M. Vanek, P.E. / Environmental Engineer	June 28, 2024
X		Mahbuba Iasmin Mahbuba Iasmin, Ph. D., P.E. / Environmental Engineer Manager	June 28, 2024

Discharge, Receiving Waters and Water Supply Information

Outfall No.	001	Design Flow (MGD)	1.02
Latitude	40º 8' 20.64"	Longitude	-79º 59' 19.49"
Quad Name		Quad Code	
Wastewater Description:	Sewage Effluent		
Receiving Waters	Pigeon Creek (WWF)	Stream Code	39637
NHD Com ID	99410046	RMI	8.9
Drainage Area	41.1	Yield (cfs/mi^2)	0.0315
Q_{7-10} Flow (cfs)	1.29	Q_{7-10} Basis	USGS Stream Stats
Elevation (ft)	1100	Slope (ft/ft)	0.0045
Watershed No.	19-C	Chapter 93 Class.	WWF
Existing Use		Existing Use Qualifier	
Exceptions to Use		Exceptions to Criteria	
Assessment Status			
Cause(s) of Impairment			
Source(s) of Impairment			
TMDL Status		Name	

Background/Ambient Data		Data Source
pH (SU)		
Temperature (°F)		
Hardness (mg/L)		
Other:		

Nearest Downstream Public Water Supply Intake	PA American – McKeesport		
PWS Waters	Monongahela River	Flow at Intake (cfs)	
PWS RMI		Distance from Outfall (mi)	

Changes Since Last Permit Issuance: Pigeon Creek is eutrophic and not attaining its Chapter 93 aquatic life use. The Pigeon Creek STP is possibly degrading the stream.

Other Comments:

Treatment Facility Summary

Treatment Facility Name: Pigeon Creek STP

WQM Permit No.	Issuance Date
6371406 A-3	8/20/2015
6371406 A-2	11/9/2012
6371406 A-1	3/13/2008
6371406	7/29/1971

Waste Type	Degree of Treatment	Process Type	Disinfection	Avg Annual Flow (MGD)
Sewage	Secondary	Contact Stabilization	Ultraviolet	0.725

Hydraulic Capacity (MGD)	Organic Capacity (lbs/day)	Load Status	Biosolids Treatment	Biosolids Use/Disposal
1.02	770	Not Overloaded	Centrifugation	Landfill

Changes Since Last Permit Issuance:

Other Comments:

Formatted: Not Highlight

Formatted: Not Highlight

Formatted: Not Highlight

Commented [MM1]: If they don't actually have contact stabilization, we will have to update eFACTS and this section here as well.

Commented [VJ2R1]: I will change efacts after the appeal gets settled.

Compliance History

Effluent Violations for Outfall 001, from: June 1, 2023 To: April 30, 2024

Parameter	Date	SBC	DMR Value	Units	Limit Value	Units
CBOD5	04/30/24	Wkly Avg	372	lbs/day	319	lbs/day
Fecal Coliform	09/30/23	IMAX	2420	CFU/100 ml	1000	CFU/100 ml
Fecal Coliform	07/31/23	IMAX	1300	CFU/100 ml	1000	CFU/100 ml
Fecal Coliform	08/31/23	IMAX	2420	CFU/100 ml	1000	CFU/100 ml

Summary of Inspections:

Other Comments:

Development of Effluent Limitations

Outfall No. 001 **Design Flow (MGD)** 1.02
Latitude 40º 8' 20.00" **Longitude** -79º 59' 19.00"
Wastewater Description: Sewage Effluent

Technology-Based Limitations

The following technology-based limitations apply, subject to water quality analysis and BPJ where applicable:
Table 1:

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

Comments: The TSS and pH limits are the same as those in EPA's secondary treatment regulation (40 CFR § 133.102).

Average monthly and maximum daily flow must be reported pursuant to 25 Pa. Code § 92a.61(d)(1). The minimum dissolved oxygen limit of 4.0 mg/L imposed in the previous permit will be reimposed in the new permit pursuant to 25 Pa. Code § 92a.61(b) (regarding reasonable monitoring requirements) and 40 CFR § 122.44(l) (regarding anti-backsliding).

In accordance with Section I of DEP's "Standard Operating Procedure for Clean Water Program Establishing Effluent Limitations for Individual Sewage Permits" [SOP No. BCW-PMT-033, Version 1.9, March 22, 2021] and under the authority of 25 Pa. Code § 92a.61(b), annual reporting for Total Nitrogen is required for sewage discharges with design flows greater than 2,000 gpd to help evaluate treatment effectiveness and to monitor nutrient loading to the receiving watershed. Total phosphorus must be monitored for the same reason; however, because Pigeon Creek is eutrophic, total phosphorus must be limited at 2.0 mg/l as a monthly average. Pursuant to that same SOP and under the authority of § 92a.61(b), an annual reporting requirement for *E. coli* will be added to Outfall 001. *E. coli* was recently added to the bacteria water quality criteria in 25 Pa. Code § 93.7(a) and the monitoring will be used to determine if *E. coli* concentrations require additional controls.

Pigeon Creek STP uses ultraviolet light for disinfection rather than chlorine, so the TBELs for TRC from § 92a.47(a)(8) are replaced with minimum and average monthly reporting requirements for ultraviolet light transmittance pursuant to § 92a.61(b).

Mass Limits

In accordance with Table 5-3 of DEP's "Technical Guidance for the Development and Specification of Effluent Limitations. and Other Permit Conditions in NPDES Permits" and Section IV of DEP's "Standard Operating Procedure for Clean Water Program Establishing Effluent Limitations for Individual Sewage Permits", mass limits are calculated for $CBOD_5$ and TSS. Average monthly and average weekly mass limits in units of pounds per day are calculated using the concentration limits in Table 1 and the Pigeon Creek STP's design flow of 12.4 MGD with the following formula:

Design flow (average annual) (MGD) × concentration limit (mg/L) at design flow × conversion factor (8.34) = mass limit (lb/day)

Table 2. Mass Limits for Sanitary Wastewaters

Parameter	Average Monthly PPD	Average Weekly PPD
$CBOD_5$ (5/1 - 10/31)	178.6	319
$CBOD_5$ (11/1 - 4/30)	213	268
NH_3N (5/1 - 10/31)	25.5	38.2
NH_3N (11/1 - 4/30)	76.5	115
Total Suspended Solids	255	383

Water Quality-Based Limitations

A "Reasonable Potential Analysis" determined the following parameters were candidates for limitations: aluminum, cadmium, hexavalent chromium, copper, free cyanide, and zinc.

The following limitations were determined through water quality modeling (output files attached):

Table 3: Water Quality Based Effluent Limits

Parameter	Limit (mg/l)	SBC	Model
NH_3N (5/1 – 10/31)	1.5	Average monthly	WQM 7.0
NH_3N (11/1 – 4/30)	4.0	Average monthly	WQM 7.0
$CBOD_5$ (5/1 – 10/31)	21.0	Average monthly	WQM 7.0
Aluminum	Report	Average monthly	Toxics Management Spreadsheet
Cadmium	Report	Average monthly	Toxics Management Spreadsheet
Copper	0.026	Average monthly	Toxics Management Spreadsheet
Hexavalent Chromium	Report	Average monthly	Toxics Management Spreadsheet
Free Cyanide	7.3 µg/l	Average monthly	Toxics Management Spreadsheet
Zinc	Report	Average monthly	Toxics Management Spreadsheet

WQM 7.0 Water Quality Modeling Program

WQM 7.0 is a water quality modeling program for Windows that determines Waste Load Allocations ("WLAs") and effluent limitations for carbonaceous biochemical oxygen demand ("$CBOD_5$"), ammonia-nitrogen, and dissolved oxygen ("DO") for single and multiple point-source discharge scenarios. To accomplish this, the model simulates two basic processes. In the ammonia-nitrogen module, the model simulates the mixing and degradation of ammonia-nitrogen in the stream and compares calculated instream ammonia-nitrogen concentrations to ammonia-nitrogen water quality criteria. In the DO module, the model simulates the mixing and consumption of DO in the stream due to the degradation of $CBOD_5$ and ammonia-nitrogen, and compares calculated instream DO concentrations to DO water quality criteria. WQM 7.0 then determines the highest pollutant loadings that the stream can assimilate while still meeting water quality criteria under design conditions. The output from WQM 7.0 is in the references section of this report.

WQM 7.0 Modeling for Outfall 001

Table 4: 001 WQM 7.0 Summer Inputs

Discharge Characteristics	
Parameter	**Value**
River Mile Index	8.9
Discharge Flow (MGD)	1.02
Discharge Temp. (°C) (Summer)	25.0
Basin/Stream Characteristics	
Parameter	**Value**
Area in Square Miles	41.1
Q_{7-10} (cfs)	1.29
Low-flow yield (cfs/mi^2)	0.032
Elevation (ft)	1100
Slope	0.0045
Stream Temp. (°C) (Summer)	20.0
Reach Width (ft)	27
Reach Depth (ft)	0.6
Stream pH (s.u.)	7.0

The WQM 7.0 model is run for Outfall 001 to determine whether WQBELs are necessary for $CBOD_5$, ammonia-nitrogen, and/or dissolved oxygen. Input values for the WQM 7.0 model are shown in Table 4.

DEP's modeling for sewage discharges is a conditional two-step process. First, a discharge is modeled for the summer period (May through October) using warm temperatures for the discharge and the receiving stream. Modeling for the summer period is done first because allowable ammonia-nitrogen concentrations in a discharge are lower at higher temperatures (i.e., warm temperatures are more likely to result in critical loading conditions). Reduced dissolved oxygen levels also appear to increase ammonia toxicity and the maximum concentration of dissolved oxygen in water is lower at higher temperatures. The second step is to evaluate WQBELs for the winter period, but only if modeling shows that WQBELs are needed for the summer period.

For the summer period, pursuant to DEP's "Implementation Guidance of Section 93.7 Ammonia Criteria" [Doc. No. 391-2000-013] (Ammonia Guidance) and in the absence of site-specific data, the discharge temperature is assumed to be 25°C and the design stream temperature and pH are assumed to be 20°C and 7.0 s.u., respectively, based on the recommendations for warm water fisheries. The flow used for modeling is the average design flow 1.02 MGD). Input discharge concentrations for CBOD-5 and Ammonia-Nitrogen are the average monthly limits expected from secondary treatment (25 mg/L and 25.0 mg/L, respectively). The input discharge concentration for dissolved oxygen is 4.0 mg/L. The background dissolved oxygen concentration of Pigeon Creek at 20°C is assumed to be 8.24 mg/L. The width and depth of the stream have been measured and placed in the model. The yield was calculated from USGS Stream Stats. Stream Stats calculated the Q_{7-10} to be 0.779 cfs with a possible error of 66 percent. So the Q_{7-10} was increased by multiplying 0.779 cfs by 1.66 to get a Q_{7-10} of 1.29 cfs. The yield is 1.29 cfs/41.1 mi^2 which becomes 0.0315 cfs/mi^2.

Commented [MM3]: Pigeon Creek?

Table 5: 001 WQM 7.0 Winter Inputs

Discharge Characteristics	
Parameter	**Value**
River Mile Index	8.9
Discharge Flow (MGD)	1.02
Discharge Temp. (°C) (Winter)	15.0
Basin/Stream Characteristics	
Parameter	**Value**
Area in Square Miles	41.1
Q_{7-10} (cfs)	2.7
Low-flow yield (cfs/mi^2)	0.063
Elevation (ft)	1100
Slope	0.0045
Stream Temp. (°C) (Winter)	5.0
Reach Width (ft)	31
Reach Depth (ft)	0.66
Stream pH (s.u.)	7.0

For the winter period, pursuant to DEP's "Implementation Guidance of Section 93.7 Ammonia Criteria" [Doc. No. 391-2000-013] (Ammonia Guidance) and in the absence of site-specific data, the discharge temperature is assumed to be 15°C and the design stream temperature and pH are assumed to be 5°C and 7.0 s.u., respectively, based on the recommendations for warm water fisheries. The flow used for modeling is the average design flow (1.02 MGD). Input discharge concentrations for $CBOD_5$ and Ammonia-Nitrogen are the average monthly limits expected from secondary treatment (25 mg/L and 25.0 mg/L, respectively). The input discharge concentration for dissolved oxygen is 4.0 mg/L. The background dissolved oxygen concentration of Pigeon Creek at 20°C is assumed to be 8.24 mg/L. The width and depth of the stream have been measured and placed in the model.

Commented [MM4]: Pigeon Creek?

$CBOD_5$ and NH_3N Discussion

The IMAX concentration limits for ammonia-nitrogen and $CBOD_5$ will appear in the permit, but since 24-hour composite sampling is required and IMAX limits only apply when grab sampling is specified, Pigeon Creek does not need to report IMAX results on DMRs for compliance with the IMAX limits. The IMAX limits may be used by DEP to spot-check compliance by collecting a grab sample during a site inspection.

Pursuant to Chapter 5, Section C.2 of DEP's "Technical Guidance for the Development and Specification of Effluent Limitations and Other Permit Conditions in NPDES Permits" limits for conventional pollutants, limits greater than 10.0 and less than 60.0 are rounded down to the nearest 1.0 mg/L. The mass limits in Table 2 account for this rounding convention.

Phosphorus Discussion

Sewage discharges with design flows > 2,000 GPD will include monitoring, at a minimum, for Total Phosphorus in new and reissued permits, with a monitoring frequency equivalent to conventional pollutants in Table 6-3 of the Permit Writer's Manual where the facility discharges to nutrient-impaired waters. In addition, pursuant to § 96.5, when it is determined that the discharge of Total Phosphorus, alone or in combination with the discharge of other pollutants, contributes or threatens to impair existing or designated uses in a free-flowing water, Total Phosphorus discharges will be limited to 2 mg/L as an average monthly limit, at a minimum. The Department performed a Cause and Effect survey on May 6, 2021. The report from this survey is attached in the reference section of this report. This survey suggests that the Pigeon Creek STP may be degrading the stream which is why total phosphorus will be limited in the permit. The authority will be given an interim period of three years of monitoring for phosphorus to get the phosphorus removal equipment installed at the plant. The phosphorus limits will be imposed for the final two years of the permit cycle.

Toxics Management Spreadsheet

The Toxics Management Spreadsheet (TMS) is used to calculate a reasonable potential (RP) analysis and determine water quality-based effluent limitations for discharges of toxic pollutants. Discharge characteristics and stream characteristics are placed into the TMS. For NPDES renewals, the maximum concentration reported in the application or Discharge Monitoring Reports (DMR's) is entered as the discharge concentration for that pollutant. That will be used to conduct the reasonable potential (RP) analysis after a WQBEL is calculated.

WQBEL's can be based on acute fish criterion (AFC), chronic fish criterion (CFC), threshold human health criterion (THH), or carcinogen risk level (CRC). AFC is based on the mixing of stream flow and wastewater flow after 15 minutes. CFC is based on the mixing of stream flow and wastewater flow after 12 hours. THH is based on the mixing of stream flow and wastewater flow after 12 hours or at the point of a potable water intake. CRL is based on the mixing of stream flow and wastewater flow after 12 hours. CRL limits use the harmonic mean flow of the stream. AFC, CFC and THH WQBEL's use the $Q_{7\text{-}10}$ flow of the receiving stream.

Table 3 lists the recommended WQBEL's for Pigeon Creek STP. Numeric limits for copper and free cyanide are recommended. Monitoring for aluminum, cadmium, hexavalent chromium, and zinc is also recommended. The TMS recommends numeric limits for pollutants whose application reported maximum discharge concentration is equal to or greater than 50% of the WQBEL. The TMS recommends monitoring for pollutants whose application reported maximum discharge concentration is greater than 10% and less than 50% of the WQBEL for conservative pollutants. The TMS recommends monitoring for pollutants whose application reported maximum discharge concentration is greater than 25% and less than 50% of the WQBEL for non-conservative pollutants. Interim and final limits will be imposed. The interim 3-year period will only require monitoring for all pollutants. The numeric limits will be imposed for the final two years of the permit.

The input and output for the TMS is attached in the references section of this report.

Influent Monitoring

Pursuant to Section IV.E.8 of DEP's "Standard Operating Procedure (SOP) for Clean Water Program New and Reissuance Sewage Individual NPDES Permit Applications" [SOP No. BCW-PMT-002, Version 1.9, January 6, 2020], for POTWs with

design flows greater than 2,000 GPD, influent BOD5 and TSS monitoring is established in the permit with the same minimum measurement frequency and sample type used for the effluent (2/week, 24-Hr Composite for the Pigeon Creek STP). The required influent monitoring will be for BOD_5 and TSS including average monthly and average weekly influent loading and average monthly and average weekly influent concentrations.

The organic design capacity of 1400 lbs BOD_5 per day for the treatment facility is used to prepare the annual Municipal Wasteload Management Report to determine whether an "organic overload" condition exists, as defined in 25 Pa. Code Chapter 94. That is, BOD_5 is the parameter used to determine whether a sewage treatment plant is organically overloaded.

Industrial Contributors

The applicant states that the collection system does not have any industrial contributors.

PFAS/PFOS Parameters

In February 2024, DEP implemented a new monitoring initiative for PFAS consistent with an EPA memorandum that provides guidance to states for addressing PFAS discharges. PFAS are a family of thousands of synthetic organic chemicals that contain a chain of strong carbon-fluorine bonds. Many PFAS are highly stable, water- and oil-resistant, and exhibit other properties that make them useful in a variety of consumer products and industrial processes. PFAS are resistant to biodegradation, photooxidation, direct photolysis, and hydrolysis and do not readily degrade naturally; thus, many PFAS accumulate over time. According to the United States Department of Health and Human Services, Agency for Toxic Substances and Disease Registry (ATSDR), the environmental persistence and mobility of some PFAS, combined with decades of widespread use, have resulted in their presence in surface water, groundwater, drinking water, rainwater, soil, sediment, ice caps, outdoor and indoor air, plants, animal tissue, and human blood serum across the globe. ATSDR also reported that exposure to certain PFAS can lead to adverse human health impacts Due to their durability, toxicity, persistence, and pervasiveness, PFAS have emerged as potentially significant pollutants of concern.

In accordance with Section II.I of DEP's "Standard Operating Procedure (SOP) for Clean Water Program – Establishing Effluent Limitations for Individual Industrial Permits" [SOP No. BCW-PMT-032] and under the authority of 25 Pa. Code § 92a.61(b), DEP has determined that monitoring for a subset of common/well-studied PFAS including Perfluorooctanoic acid (PFOA), Perfluorooctanesulfonic acid (PFOS), Perfluorobutanesulfonic acid (PFBS), and Hexafluoropropylene oxide dimer acid (HFPO-DA) is necessary to help understand the extent of environmental contamination by PFAS in the Commonwealth and the extent to which point source dischargers are contributors. SOP BCW-PMT-032 directs permit writers to consider special monitoring requirements for PFOA, PFOS, PFBS, and HFPO-DA in the following instances:

a. If sampling that is completed as part of the permit renewal application reveals a detection of PFOA, PFOS, HFPO-DA or PFBS (any of these compounds), the application manager will establish a quarterly monitoring requirement for PFOA, PFOS, HFPO-DA and PFBS (all of these compounds) in the permit.

b. If sampling that is completed as part of the permit renewal application demonstrates non-detect values at or below the Target QLs for PFOA, PFOS, HFPO-DA and PFBS (all of these compounds in a minimum of 3 samples), the application manager will establish an annual monitoring requirement for PFOA, PFOS, HFPO-DA and PFBS in the permit.

c. In all cases the application manager will include a condition in the permit that the permittee may cease monitoring for PFOA, PFOS, HFPO-DA and PFBS when the permittee reports non-detect values at or below the Target QL for four consecutive monitoring periods for each PFAS parameter that is analyzed. Use the following language: The permittee may discontinue monitoring for PFOA, PFOS, HFPO-DA, and PFBS if the results in 4 consecutive monitoring periods indicate non-detects at or below Quantitation Limits of 4.0 ng/L for PFOA, 3.7 ng/L for PFOS, 3.5 ng/L for PFBS and 6.4 ng/L for HFPO-DA. When monitoring is discontinued, permittees should enter a No Discharge Indicator (NODI) Code of "GG" on DMRs.

The Authority's application was submitted before the NPDES permit application forms were updated to require sampling for PFOA, PFOS, PFBS, and HFPO-DA. Also, according to EPA's guidance, The Authority receives waste from one of the industries EPA expects to be a source for PFAS (landfill leachate from Arden Landfill). Therefore, quarterly reporting of PFOA, PFOS, PFBS, and HFPO-DA will be required consistent with Section II.G of SOP BCW-PMT-0332.

As stated in Section II.G.3 of SOP BCW-PMT-0332, if non-detect values at or below DEP's Target QLs are reported for four consecutive monitoring periods (i.e., four consecutive quarterly results), then the monitoring may be discontinued. Footnote (3) has been added to Part A of the NPDES Permit, which further discusses monitoring and reporting requirements.

TRE for WQBEL's

The water quality analysis revealed the need for water quality based effluent limits for copper and free cyanide. A part C condition has been added to the permit which gives Pigeon Creek Sanitary Authority the ability to conduct a Toxics Reduction Evaluation (TRE) and collect site-specific data for the possibility of site-specific water quality based effluent limits. The part C condition gives the authority three years to investigate the sources of free cyanide and copper in its collection system. The applicant should submit a work plan within six months of the permit effective date to describe the steps it will take to ultimately comply with the copper and free cyanide limits.

Whole Effluent Toxicity (WET)

The previous permit required chronic WET testing with a toxic in-stream waste concentration (TIWC) of 1%. Pigeon Creek Sanitary Authorityu was required to perform testing for the renewal permit application.

A WET test summary is included in the references section of this FACT SHEET. The summary shows that GUJSPA passed its annual tests and did not need to do a TRE and that WET limits are not necessary.

This draft permit recommends annual chronic WET testing with a TIWC of 55%. The following shows how the TIWC was determined.

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

☐ For the permit renewal application (4 tests).
☒ Annually 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%, 60%, 30%, 2%, and 1%. The Target Instream Waste Concentration (TIWC) to be used for analysis of the results is: 1%.

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

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

1. **Determine IWC – Acute (IWCa)**:

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

   [(1.02 MGD x 1.547) / ((1.29 cfs x 1.0) + (1.02 MGD x 1.547))] x 100 = **55.02%**

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

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

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

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

   [(1.02 MGD x 1.547) / ((1.29 cfs x 1.0) + (1.02 MGD x 1.547))] x 100 = **55.02%**

3. **Determine Dilution Series**

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

   Dilution Series = 100%, 78%, 55%, 28%, and 14%.

WET Limits

Has reasonable potential been determined? ☐ YES ☒ NO

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

The WET Summary is attached in the reference section of this report.

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" (386-0400-001), SOPs and/or BPJ.

Outfall 001, Effective Period: Three (3) years after 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	Daily Maximum	Instant. Maximum		
Flow (MGD)	Report	Report Daily Max	XXX	XXX	XXX	XXX	Continuous	Recorded
pH (S.U.)	XXX	XXX	6.0 Inst Min	XXX	XXX	9.0	1/day	Grab
DO	XXX	XXX	4.0 Inst Min	XXX	XXX	XXX	1/day	Grab
TRC	XXX	XXX	XXX	0.24	XXX	0.8	1/day	Grab
CBOD5 Nov 1 - Apr 30	213	319	XXX	25.0	37.5 Wkly Avg	50	2/week	24-Hr Composite
CBOD5 May 1 - Oct 31	178.6	268.0	XXX	21.0	31.5 Wkly Avg	42	1/week	24-Hr Composite
TSS	255	383	XXX	30.0	45.0 Wkly Avg	60	2/week	24-Hr Composite
Fecal Coliform (No./100 ml) Oct 1 - Apr 30	XXX	XXX	XXX	2000 Geo Mean	XXX	10000	2/week	Grab
Fecal Coliform (No./100 ml) May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	XXX	1000	2/week	Grab
E. Coli (No./100 ml)	XXX	XXX	XXX	XXX	Report	XXX	1/month	Grab
Total Nitrogen	XXX	XXX	XXX	XXX	Report	XXX	1/month	24-Hr Composite
Ammonia-Nitrogen Nov 1 - Apr 30	86.8	130.2	XXX	9.0	13.5 Wkly Avg	18.0	2/week	24-Hr Composite

Commented [MM5]: For the Draft Permit, we probably want a narrative date such as "Beginning of Fourth Year since Permit Effective Date" instead of the hard date.

Commented [VJ6R5]: Will change to 3 yrs after effective date

Commented [MM7]: This should be IMAX I think.

Outfall 001 , Continued (from August 1, 2027 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	Daily Maximum	Instant. Maximum		
Ammonia-Nitrogen May 1 - Oct 31	25.5	38.3	XXX	3.0	4.5 Wkly Avg	6	2/week	24-Hr Composite
Total Phosphorus	XXX	XXX	XXX	2.0	4.0	5	2/week	24-Hr Composite
Total Aluminum	XXX	XXX	XXX	Report	Report	XXX	1/week	24-Hr Composite
Total Cadmium	XXX	XXX	XXX	Report	Report	XXX	1/week	24-Hr Composite
Hexavalent Chromium	XXX	XXX	XXX	Report	Report	XXX	1/week	24-Hr Composite
Total Copper (ug/L)	XXX	XXX	XXX	26.0	41.0	66	1/week	24-Hr Composite
Free Cyanide (ug/L)	XXX	XXX	XXX	7.3	11.4	18.2	1/week	24-Hr Composite
Total Zinc	XXX	XXX	XXX	Report	Report	XXX	1/week	24-Hr Composite

Compliance Sampling Location: outfall 001

Other Comments:

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" (386-0400-001), SOPs and/or BPJ.

Outfall 001, Effective Period: Permit Effective Date through Three years after effective date.

Commented [MM8]: Same comment as above.

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	Daily Maximum	Instant. Maximum		
Flow (MGD)	Report	Report Daily Max	XXX	XXX	XXX	XXX	Continuous	Recorded
pH (S.U.)	XXX	XXX	6.0 Inst Min	XXX	XXX	9.0	1/day	Grab
DO	XXX	XXX	4.0 Inst Min	XXX	XXX	XXX	1/day	Grab
TRC	XXX	XXX	XXX	0.24	XXX	0.8	1/day	Grab
CBOD5 Nov 1 - Apr 30	213	319	XXX	25.0	37.5 Wkly Avg	50	2/week	24-Hr Composite
CBOD5 May 1 - Oct 31	178.6	268.0	XXX	21.0	31.5 Wkly Avg	42	1/week	24-Hr Composite
TSS	255	383	XXX	30.0	45.0 Wkly Avg	60	2/week	24-Hr Composite
Fecal Coliform (No./100 ml) Oct 1 - Apr 30	XXX	XXX	XXX	2000 Geo Mean	XXX	10000	2/week	Grab
Fecal Coliform (No./100 ml) May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	XXX	1000	2/week	Grab
E. Coli (No./100 ml)	XXX	XXX	XXX	XXX	Report	XXX	1/month	Grab
Total Nitrogen	XXX	XXX	XXX	XXX	Report	XXX	1/month	24-Hr Composite
Ammonia-Nitrogen Nov 1 - Apr 30	76.6	114.8	XXX	9.0	13.5 Wkly Avg	18	2/week	24-Hr Composite
Ammonia-Nitrogen May 1 - Oct 31	25.5	38.3	XXX	3.0	4.5 Wkly Avg	6	2/week	24-Hr Composite

Outfall 001 , Continued (from Permit Effective Date through July 31, 2027)

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2)	Required
	Average Monthly	Weekly Average	Minimum	Average Monthly	Daily Maximum	Instant. Maximum	Measurement Frequency	Sample Type
Total Phosphorus	XXX	XXX	XXX	Report	Report	XXX	2/week	24-Hr Composite
Total Aluminum	XXX	XXX	XXX	Report	Report	XXX	1/week	24-Hr Composite
Total Cadmium	XXX	XXX	XXX	Report	Report	XXX	1/week	24-Hr Composite
Hexavalent Chromium	XXX	XXX	XXX	Report	Report	XXX	1/week	24-Hr Composite
Total Copper	XXX	XXX	XXX	Report	Report	XXX	1/week	24-Hr Composite
Free Cyanide (ug/L)	XXX	XXX	XXX	Report	Report	XXX	1/week	24-Hr Composite
Total Zinc	XXX	XXX	XXX	Report	Report	XXX	1/week	24-Hr Composite

Compliance Sampling Location: at outfall 001

Other Comments:

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" (386-0400-001), 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		
BOD5 Raw Sewage Influent	Report	Report	XXX	Report	Report	XXX	2/week	24-Hr Composite
TSS Raw Sewage Influent	Report	Report	XXX	Report	Report	XXX	2/week	24-Hr Composite
PFOA (ng/L)	XXX	XXX	XXX	XXX	XXX	Report	1/year	Grab
PFOS (ng/L)	XXX	XXX	XXX	XXX	XXX	Report	1/year	Grab
PFBS (ng/L)	XXX	XXX	XXX	XXX	XXX	Report	1/year	Grab
HFPO-DA (ng/L)	XXX	XXX	XXX	XXX	XXX	Report	1/year	Grab

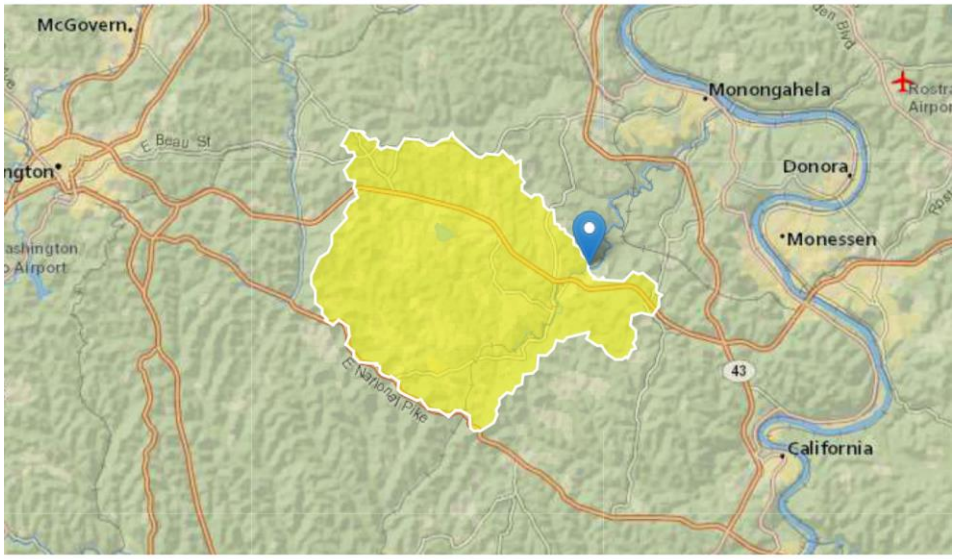
Compliance Sampling Location: outfall 001

Other Comments: footnote in permit will provide information to eliminate sampling after 3 events of non-detectable results

USGS Stream Stats

StreamStats Report

Region ID: PA
Workspace ID: PA20240603130402613000
Clicked Point (Latitude, Longitude): 40.13922, -79.98798
Time: 2024-06-03 09:04:24 -0400



Collapse All

Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
BSLOPD	Mean basin slope measured in degrees	7.3198	degrees
CARBON	Percentage of area of carbonate rock	0	percent
DRN	Drainage quality index from STATSGO	3.6	dimensionless
DRNAREA	Area that drains to a point on a stream	41.1	square miles
ELEV	Mean Basin Elevation	1136	feet
FOREST	Percentage of area covered by forest	39.9699	percent

Parameter Code	Parameter Description	Value	Unit
PRECIP	Mean Annual Precipitation	39	inches
STORAGE	Percentage of area of storage (lakes ponds reservoirs wetlands)	0.79	percent
URBAN	Percentage of basin with urban development	10.1561	percent

Peak-Flow Statistics

Peak-Flow Statistics Parameters [Peak Flow Region 2 SIR 2019 5094]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	41.1	square miles	0.92	1160
STORAGE	Percent Storage	0.79	percent	0	8.9

Peak-Flow Statistics Flow Report [Peak Flow Region 2 SIR 2019 5094]

PIL: Lower 90% Prediction Interval, PIU: Upper 90% Prediction Interval, ASEp: Average Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	ASEp
50-percent AEP flood	1380	ft^3/s	26.1
20-percent AEP flood	2120	ft^3/s	27
10-percent AEP flood	2690	ft^3/s	28.9
4-percent AEP flood	3490	ft^3/s	31.6
2-percent AEP flood	4140	ft^3/s	34.8
1-percent AEP flood	4850	ft^3/s	37.8
0.5-percent AEP flood	5630	ft^3/s	41.6
0.2-percent AEP flood	6760	ft^3/s	46.1

Peak-Flow Statistics Citations

Roland, M.A., and Stuckey, M.H.,2019, Development of regression equations for the estimation of flood flows at ungaged streams in Pennsylvania: U.S. Geological Survey Scientific Investigations Report 2019–5094, 36 p. (https://doi.org/10.3133/sir20195094)

Low-Flow Statistics

Low-Flow Statistics Parameters [Low Flow Region 4]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	41.1	square miles	2.26	1400
ELEV	Mean Basin Elevation	1136	feet	1050	2580

Low-Flow Statistics Flow Report [Low Flow Region 4]

PIL: Lower 90% Prediction Interval, PIU: Upper 90% Prediction Interval, ASEp: Average Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	SE	ASEp
7 Day 2 Year Low Flow	1.85	ft^3/s	43	43
30 Day 2 Year Low Flow	2.99	ft^3/s	38	38
7 Day 10 Year Low Flow	0.779	ft^3/s	66	66
30 Day 10 Year Low Flow	1.26	ft^3/s	54	54
90 Day 10 Year Low Flow	2.12	ft^3/s	41	41

Low-Flow Statistics Citations

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

Annual Flow Statistics

Annual Flow Statistics Parameters [Statewide Mean and Base Flow]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	41.1	square miles	2.26	1720
ELEV	Mean Basin Elevation	1136	feet	130	2700
PRECIP	Mean Annual Precipitation	39	inches	33.1	50.4
FOREST	Percent Forest	39.9699	percent	5.1	100

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
URBAN	Percent Urban	10.1561	percent	0	89

Annual Flow Statistics Flow Report [Statewide Mean and Base Flow]

PIL: Lower 90% Prediction Interval, PIU: Upper 90% Prediction Interval, ASEp: Average Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	SE	ASEp
Mean Annual Flow	52	ft^3/s	12	12

Annual Flow Statistics Citations

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

General Flow Statistics

General Flow Statistics Parameters [Statewide Mean and Base Flow]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	41.1	square miles	2.26	1720
PRECIP	Mean Annual Precipitation	39	inches	33.1	50.4
CARBON	Percent Carbonate	0	percent	0	99
FOREST	Percent Forest	39.9699	percent	5.1	100
URBAN	Percent Urban	10.1561	percent	0	89

General Flow Statistics Flow Report [Statewide Mean and Base Flow]

PIL: Lower 90% Prediction Interval, PIU: Upper 90% Prediction Interval, ASEp: Average Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	SE	ASEp
Harmonic Mean Streamflow	9.82	ft^3/s	38	38

General Flow Statistics Citations

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

Base Flow Statistics

Base Flow Statistics Parameters [Statewide Mean and Base Flow]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	41.1	square miles	2.26	1720
PRECIP	Mean Annual Precipitation	39	inches	33.1	50.4
CARBON	Percent Carbonate	0	percent	0	99
FOREST	Percent Forest	39.9699	percent	5.1	100
URBAN	Percent Urban	10.1561	percent	0	89

Base Flow Statistics Flow Report [Statewide Mean and Base Flow]

PIL: Lower 90% Prediction Interval, PIU: Upper 90% Prediction Interval, ASEp: Average Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	SE	ASEp
Base Flow 10 Year Recurrence Interval	15.5	ft^3/s	21	21
Base Flow 25 Year Recurrence Interval	13.5	ft^3/s	21	21
Base Flow 50 Year Recurrence Interval	12.4	ft^3/s	23	23

Base Flow Statistics Citations

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

Bankfull Statistics

Bankfull Statistics Parameters [Statewide Bankfull Noncarbonate 2018 5066]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	41.1	square miles	2.62	207
CARBON	Percent Carbonate	0	percent		

Bankfull Statistics Parameters [Appalachian Highlands D Bieger 2015]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	41.1	square miles	0.07722	940.1535

Bankfull Statistics Parameters [Appalachian Plateaus P Bieger 2015]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	41.1	square miles	0.081081	536.995602

Bankfull Statistics Parameters [USA Bieger 2015]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	41.1	square miles	0.07722	59927.7393

Bankfull Statistics Flow Report [Statewide Bankfull Noncarbonate 2018 5066]

PIL: Lower 90% Prediction Interval, PIU: Upper 90% Prediction Interval, ASEp: Average Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	SE
Bankfull Area	236	ft^2	64
Bankfull Streamflow	1120	ft^3/s	74
Bankfull Width	78.7	ft	59
Bankfull Depth	3	ft	56

Bankfull Statistics Flow Report [Appalachian Highlands D Bieger 2015]

Statistic	Value	Unit
Bieger_D_channel_width	71	ft

Statistic	Value	Unit
Bieger_D_channel_depth	3.26	ft
Bieger_D_channel_cross_sectional_area	236	ft^2

Bankfull Statistics Flow Report [Appalachian Plateaus P Bieger 2015]

Statistic	Value	Unit
Bieger_P_channel_width	77.6	ft
Bieger_P_channel_depth	3.3	ft
Bieger_P_channel_cross_sectional_area	254	ft^2

Bankfull Statistics Flow Report [USA Bieger 2015]

Statistic	Value	Unit
Bieger_USA_channel_width	45.8	ft
Bieger_USA_channel_depth	2.66	ft
Bieger_USA_channel_cross_sectional_area	127	ft^2

Bankfull Statistics Flow Report [Area-Averaged]

PIL: Lower 90% Prediction Interval, PIU: Upper 90% Prediction Interval, ASEp: Average Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	SE
Bankfull Area	236	ft^2	64
Bankfull Streamflow	1120	ft^3/s	74
Bankfull Width	78.7	ft	59
Bankfull Depth	3	ft	56
Bieger_D_channel_width	71	ft	
Bieger_D_channel_depth	3.26	ft	
Bieger_D_channel_cross_sectional_area	236	ft^2	
Bieger_P_channel_width	77.6	ft	
Bieger_P_channel_depth	3.3	ft	
Bieger_P_channel_cross_sectional_area	254	ft^2	
Bieger_USA_channel_width	45.8	ft	
Bieger_USA_channel_depth	2.66	ft	

Statistic	Value	Unit	SE
Bieger_USA_channel_cross_sectional_area	127	ft^2	

Bankfull Statistics Citations

Clune, J.W., Chaplin, J.J., and White, K.E.,2018, Comparison of regression relations of bankfull discharge and channel geometry for the glaciated and nonglaciated settings of Pennsylvania and southern New York: U.S. Geological Survey Scientific Investigations Report 2018–5066, 20 p. (https://doi.org/10.3133/sir20185066)
Bieger, Katrin; Rathjens, Hendrik; Allen, Peter M.; and Arnold, Jeffrey G.,2015, Development and Evaluation of Bankfull Hydraulic Geometry Relationships for the Physiographic Regions of the United States, Publications from USDA-ARS / UNL Faculty, 17p. (https://digitalcommons.unl.edu/usdaarsfacpub/1515?utm_source=digitalcommons.unl.edu%2Fusdaarsfacpub%2F1515&utm_medium=PDF&utm_

Maximum Probable Flood Statistics

Maximum Probable Flood Statistics Parameters [Crippen Bue Region 4]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	41.1	square miles	0.1	10000

Maximum Probable Flood Statistics Flow Report [Crippen Bue Region 4]

Statistic	Value	Unit
Maximum Flood Crippen Bue Regional	55000	ft^3/s

Maximum Probable Flood Statistics Citations

Crippen, J.R. and Bue, Conrad D.1977, Maximum Floodflows in the Conterminous United States, Geological Survey Water-Supply Paper 1887, 52p. (https://pubs.usgs.gov/wsp/1887/report.pdf)

WQM 7.0 MODEL OUTPUT

Warm Weather Analysis

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
19C	39637	PIGEON CREEK	8.900	1100.00	41.10	0.00450	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	0.032	0.00	0.00	0.000	0.000	10.0	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
Pigeon Creek ST	PA0044679	1.0200	1.0200	1.0200	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	4.00	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
19C	39637	PIGEON CREEK	**8.000**	1078.40	48.00	0.00450	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	0.032	0.00	0.00	0.000	0.000	10.0	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	25.00	7.00

Parameter Data

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

Tuesday, June 4, 2024 Version 1.1 Page 2 of 2

WQM 7.0 Modeling Specifications

Parameters	Both	Use Inputted Q1-10 and Q30-10 Flows	☑
WLA Method	EMPR	Use Inputted W/D Ratio	☐
Q1-10/Q7-10 Ratio	0.64	Use Inputted Reach Travel Times	☐
Q30-10/Q7-10 Ratio	1.36	Temperature Adjust Kr	☑
D.O. Saturation	85.00%	Use Balanced Technology	☑
D.O. Goal	5		

WQM 7.0 Hydrodynamic Outputs

SWP Basin	Stream Code	Stream Name
19C	39637	PIGEON 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												
8.900	1.29	0.00	1.29	1.5779	0.00450	.632	27.39	43.38	0.17	0.331	22.25	7.00
Q1-10 Flow												
8.900	0.83	0.00	0.83	1.5779	0.00450	NA	NA	NA	0.15	0.366	21.72	7.00
Q30-10 Flow												
8.900	1.76	0.00	1.76	1.5779	0.00450	NA	NA	NA	0.18	0.305	22.64	7.00

WQM 7.0 Wasteload Allocations

SWP Basin	Stream Code	Stream Name
19C	39637	PIGEON 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
8.900	Pigeon Creek ST	14.53	22.16	14.53	22.16	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
8.900	Pigeon Creek ST	1.59	3.37	1.59	3.37	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)		
8.90	Pigeon Creek ST	21.56	21.56	3.37	3.37	4	4	0	0

Tuesday, June 4, 2024 Version 1.1 Page 1 of 1

WQM 7.0 D.O.Simulation

SWP Basin	Stream Code	Stream Name
19C	39637	PIGEON CREEK

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
8.900	1.020	22.253	7.000
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
27.395	0.632	43.378	0.166
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
12.75	1.179	1.85	0.833
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
5.912	7.489	Tsivoglou	5
Reach Travel Time (days)			
0.331			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.033	12.21	1.80	5.62
0.066	11.69	1.75	5.43
0.099	11.19	1.70	5.32
0.133	10.72	1.66	5.27
0.166	10.26	1.61	5.25
0.199	9.83	1.57	5.28
0.232	9.41	1.53	5.32
0.265	9.01	1.48	5.39
0.298	8.63	1.44	5.46
0.331	8.27	1.40	5.55

WQM 7.0 Effluent Limits

SWP Basin	Stream Code	Stream Name
19C	39637	PIGEON 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)
8.900	Pigeon Creek ST	PA0044679	1.020	CBOD5	21.56		
				NH3-N	3.37	6.74	
				Dissolved Oxygen			4

Tuesday, June 4, 2024 Version 1.1 Page 1 of 1

Cold Weather Analysis

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
19C	39637	PIGEON CREEK	8.900	1100.00	41.10	0.00450	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	0.063	0.00	0.00	0.000	0.000	10.0	0.00	0.00	5.00	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
Pigeon Creek ST	PA0044679	1.0200	1.0200	1.0200	0.000	15.00	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	4.00	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
19C	39637	PIGEON CREEK	8.000	1078.40	48.00	0.00450	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	0.063	0.00	0.00	0.000	0.000	10.0	0.00	0.00	5.00	7.00	0.00	0.00
Q1-10		0.00	0.00	0.000	0.000							
Q30-10		0.00	0.00	0.000	0.000							

Discharge Data

Name	Permit Number	Existing Disc Flow (mgd)	Permitted Disc Flow (mgd)	Design Disc Flow (mgd)	Reserve Factor	Disc Temp (°C)	Disc pH
		0.0000	0.0000	0.0000	0.000	25.00	7.00

Parameter Data

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

Tuesday, June 4, 2024 Version 1.1 Page 2 of 2

WQM 7.0 Hydrodynamic Outputs

SWP Basin	Stream Code	Stream Name
19C	39637	PIGEON 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												
8.900	2.59	0.00	2.59	1.5779	0.00450	.66	30.87	46.77	0.20	0.269	8.79	7.00
Q1-10 Flow												
8.900	1.66	0.00	1.66	1.5779	0.00450	NA	NA	NA	0.18	0.310	9.88	7.00
Q30-10 Flow												
8.900	3.52	0.00	3.52	1.5779	0.00450	NA	NA	NA	0.23	0.240	8.09	7.00

Tuesday, June 4, 2024 Version 1.1 Page 1 of 1

WQM 7.0 Wasteload Allocations

SWP Basin	Stream Code	Stream Name
19C	39637	PIGEON 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
8.900	Pigeon Creek ST	24.1	49.42	24.1	49.42	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
8.900	Pigeon Creek ST	4.07	13.14	4.07	13.14	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)		
8.90	Pigeon Creek ST	25	25	13.14	13.14	4	4	0	0

Tuesday, June 4, 2024 Version 1.1 Page 1 of 1

WQM 7.0 D.O.Simulation

SWP Basin	Stream Code	Stream Name
19C	39637	PIGEON CREEK

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
8.900	1.020	8.787	7.000
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
30.873	0.660	46.772	0.204
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
10.71	1.306	4.98	0.295
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
6.636	6.702	Tsivoglou	5
Reach Travel Time (days)			
0.269			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.027	10.49	4.94	6.98
0.054	10.27	4.90	7.28
0.081	10.06	4.86	7.54
0.108	9.85	4.82	7.76
0.134	9.64	4.78	7.95
0.161	9.44	4.74	8.12
0.188	9.25	4.71	8.24
0.215	9.05	4.67	8.24
0.242	8.87	4.63	8.24
0.269	8.68	4.60	8.24

Tuesday, June 4, 2024 Version 1.1 Page 1 of 1

WQM 7.0 Effluent Limits

SWP Basin	Stream Code	Stream Name
19C	39637	PIGEON 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)
8.900	Pigeon Creek ST	PA0044679	1.020	CBOD5	25		
				NH3-N	13.14	26.28	
				Dissolved Oxygen			4

Tuesday, June 4, 2024 Version 1.1 Page 1 of 1

TMS Output

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Toxics Management Spreadsheet
Version 1.4, May 2023

Model Results

Pigeon Creek STP, NPDES Permit No. PA0044679, 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)
8.9	1.29		1.29	1.578	0.005	0.632	6.315	10.	0.166	0.331	0.33
8	1.54		1.5435					10.000			

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)
8.9	9.31		9.31	1.578	0.005	1.135	6.315	5.564	0.35	0.157	0.493
8	10.858		10.86								

☑ *Wasteload Allocations*

☑ *AFC* CCT (min): 0.330 PMF: 1 Analysis Hardness (mg/l): 166.7 Analysis pH: 7.80

Pollutants	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Sulfate (PWS)	0	0		0	N/A	N/A	N/A	
Total Aluminum	0	0		0	750	750	1,365	
Total Antimony	0	0		0	1,100	1,100	2,003	
Total Arsenic	0	0		0	340	340	619	Chem Translator of 1 applied
Total Barium	0	0		0	21,000	21,000	38,230	
Total Boron	0	0		0	8,100	8,100	14,746	
Total Cadmium	0	0		0	3.309	3.59	6.53	Chem Translator of 0.923 applied
Total Chromium (III)	0	0		0	865.894	2,740	4,988	Chem Translator of 0.316 applied
Hexavalent Chromium	0	0		0	16	16.3	29.7	Chem Translator of 0.982 applied
Total Cobalt	0	0		0	95	95.0	173	
Total Copper	0	0		0	21.751	22.7	41.2	Chem Translator of 0.96 applied
Free Cyanide	0	0		0	22	22.0	40.1	
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	112.124	156	285	Chem Translator of 0.717 applied

Total Manganese	0	0		0	N/A	N/A	N/A	
Total Mercury	0	0		0	1.400	1.65	3.0	Chem Translator of 0.85 applied
Total Nickel	0	0		0	721.485	723	1,316	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	7.747	9.11	16.6	Chem Translator of 0.85 applied
Total Thallium	0	0		0	65	65.0	118	
Total Zinc	0	0		0	180.678	185	336	Chem Translator of 0.978 applied
Acrolein	0	0		0	3	3.0	5.46	
Acrylamide	0	0		0	N/A	N/A	N/A	
Acrylonitrile	0	0		0	650	650	1,183	
Benzene	0	0		0	640	640	1,165	
Bromoform	0	0		0	1,800	1,800	3,277	
Carbon Tetrachloride	0	0		0	2,800	2,800	5,097	
Chlorobenzene	0	0		0	1,200	1,200	2,185	
Chlorodibromomethane	0	0		0	N/A	N/A	N/A	
2-Chloroethyl Vinyl Ether	0	0		0	18,000	18,000	32,768	
Chloroform	0	0		0	1,900	1,900	3,459	
Dichlorobromomethane	0	0		0	N/A	N/A	N/A	
1,2-Dichloroethane	0	0		0	15,000	15,000	27,307	
1,1-Dichloroethylene	0	0		0	7,500	7,500	13,654	
1,2-Dichloropropane	0	0		0	11,000	11,000	20,025	
1,3-Dichloropropylene	0	0		0	310	310	564	
Ethylbenzene	0	0		0	2,900	2,900	5,279	
Methyl Bromide	0	0		0	550	550	1,001	
Methyl Chloride	0	0		0	28,000	28,000	50,973	
Methylene Chloride	0	0		0	12,000	12,000	21,846	
1,1,2,2-Tetrachloroethane	0	0		0	1,000	1,000	1,820	
Tetrachloroethylene	0	0		0	700	700	1,274	
Toluene	0	0		0	1,700	1,700	3,095	
1,2-trans-Dichloroethylene	0	0		0	6,800	6,800	12,379	
1,1,1-Trichloroethane	0	0		0	3,000	3,000	5,461	
1,1,2-Trichloroethane	0	0		0	3,400	3,400	6,190	
Trichloroethylene	0	0		0	2,300	2,300	4,187	
Vinyl Chloride	0	0		0	N/A	N/A	N/A	
2-Chlorophenol	0	0		0	560	560	1,019	
2,4-Dichlorophenol	0	0		0	1,700	1,700	3,095	
2,4-Dimethylphenol	0	0		0	660	660	1,202	
4,6-Dinitro-o-Cresol	0	0		0	80	80.0	146	
2,4-Dinitrophenol	0	0		0	660	660	1,202	
2-Nitrophenol	0	0		0	8,000	8,000	14,564	
4-Nitrophenol	0	0		0	2,300	2,300	4,187	
p-Chloro-m-Cresol	0	0		0	160	160	291	
Pentachlorophenol	0	0		0	19.492	19.5	35.5	
Phenol	0	0		0	N/A	N/A	N/A	
2,4,6-Trichlorophenol	0	0		0	460	460	837	
Acenaphthene	0	0		0	83	83.0	151	
Anthracene	0	0		0	N/A	N/A	N/A	
Benzidine	0	0		0	300	300	546	

Benzo(a)Anthracene	0	0		0	0.5	0.5	0.91	
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	54,614	
Bis(2-Chloroisopropyl)Ether	0	0		0	N/A	N/A	N/A	
Bis(2-Ethylhexyl)Phthalate	0	0		0	4,500	4,500	8,192	
4-Bromophenyl Phenyl Ether	0	0		0	270	270	492	
Butyl Benzyl Phthalate	0	0		0	140	140	255	
2-Chloronaphthalene	0	0		0	N/A	N/A	N/A	
Chrysene	0	0		0	N/A	N/A	N/A	
Dibenzo(a,h)Anthrancene	0	0		0	N/A	N/A	N/A	
1,2-Dichlorobenzene	0	0		0	820	820	1,493	
1,3-Dichlorobenzene	0	0		0	350	350	637	
1,4-Dichlorobenzene	0	0		0	730	730	1,329	
3,3-Dichlorobenzidine	0	0		0	N/A	N/A	N/A	
Diethyl Phthalate	0	0		0	4,000	4,000	7,282	
Dimethyl Phthalate	0	0		0	2,500	2,500	4,551	
Di-n-Butyl Phthalate	0	0		0	110	110	200	
2,4-Dinitrotoluene	0	0		0	1,600	1,600	2,913	
2,6-Dinitrotoluene	0	0		0	990	990	1,802	
1,2-Diphenylhydrazine	0	0		0	15	15.0	27.3	
Fluoranthene	0	0		0	200	200	364	
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	18.2	
Hexachlorocyclopentadiene	0	0		0	5	5.0	9.1	
Hexachloroethane	0	0		0	60	60.0	109	
Indeno(1,2,3-cd)Pyrene	0	0		0	N/A	N/A	N/A	
Isophorone	0	0		0	10,000	10,000	18,205	
Naphthalene	0	0		0	140	140	255	
Nitrobenzene	0	0		0	4,000	4,000	7,282	
n-Nitrosodimethylamine	0	0		0	17,000	17,000	30,948	
n-Nitrosodi-n-Propylamine	0	0		0	N/A	N/A	N/A	
n-Nitrosodiphenylamine	0	0		0	300	300	546	
Phenanthrene	0	0		0	5	5.0	9.1	
Pyrene	0	0		0	N/A	N/A	N/A	
1,2,4-Trichlorobenzene	0	0		0	130	130	237	

☑ *CFC* CCT (min): 0.330 PMF: 1 Analysis Hardness (mg/l): 166.7 Analysis pH: 7.80

Pollutants	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
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	401	
Total Arsenic	0	0		0	150	150	273	Chem Translator of 1 applied
Total Barium	0	0		0	4,100	4,100	7,464	
Total Boron	0	0		0	1,600	1,600	2,913	

Total Cadmium	0	0		0	0.351	0.4	0.72	Chem Translator of 0.888 applied
Total Chromium (III)	0	0		0	112.635	131	238	Chem Translator of 0.86 applied
Hexavalent Chromium	0	0		0	10	10.4	18.9	Chem Translator of 0.962 applied
Total Cobalt	0	0		0	19	19.0	34.6	
Total Copper	0	0		0	13.860	14.4	26.3	Chem Translator of 0.96 applied
Free Cyanide	0	0		0	5.2	5.2	9.47	
Dissolved Iron	0	0		0	N/A	N/A	N/A	
Total Iron	0	0		0	1,500	1,500	2,731	WQC = 30 day average; PMF = 1
Total Lead	0	0		0	4.369	6.1	11.1	Chem Translator of 0.717 applied
Total Manganese	0	0		0	N/A	N/A	N/A	
Total Mercury	0	0		0	0.770	0.91	1.65	Chem Translator of 0.85 applied
Total Nickel	0	0		0	80.135	80.4	146	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	9.08	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	23.7	
Total Zinc	0	0		0	182.156	185	336	Chem Translator of 0.986 applied
Acrolein	0	0		0	3	3.0	5.46	
Acrylamide	0	0		0	N/A	N/A	N/A	
Acrylonitrile	0	0		0	130	130	237	
Benzene	0	0		0	130	130	237	
Bromoform	0	0		0	370	370	674	
Carbon Tetrachloride	0	0		0	560	560	1,019	
Chlorobenzene	0	0		0	240	240	437	
Chlorodibromomethane	0	0		0	N/A	N/A	N/A	
2-Chloroethyl Vinyl Ether	0	0		0	3,500	3,500	6,372	
Chloroform	0	0		0	390	390	710	
Dichlorobromomethane	0	0		0	N/A	N/A	N/A	
1,2-Dichloroethane	0	0		0	3,100	3,100	5,643	
1,1-Dichloroethylene	0	0		0	1,500	1,500	2,731	
1,2-Dichloropropane	0	0		0	2,200	2,200	4,005	
1,3-Dichloropropylene	0	0		0	61	61.0	111	
Ethylbenzene	0	0		0	580	580	1,056	
Methyl Bromide	0	0		0	110	110	200	
Methyl Chloride	0	0		0	5,500	5,500	10,013	
Methylene Chloride	0	0		0	2,400	2,400	4,369	
1,1,2,2-Tetrachloroethane	0	0		0	210	210	382	
Tetrachloroethylene	0	0		0	140	140	255	
Toluene	0	0		0	330	330	601	
1,2-trans-Dichloroethylene	0	0		0	1,400	1,400	2,549	
1,1,1-Trichloroethane	0	0		0	610	610	1,110	
1,1,2-Trichloroethane	0	0		0	680	680	1,238	
Trichloroethylene	0	0		0	450	450	819	
Vinyl Chloride	0	0		0	N/A	N/A	N/A	
2-Chlorophenol	0	0		0	110	110	200	
2,4-Dichlorophenol	0	0		0	340	340	619	
2,4-Dimethylphenol	0	0		0	130	130	237	

4,6-Dinitro-o-Cresol	0	0		0	16	16.0	29.1	
2,4-Dinitrophenol	0	0		0	130	130	237	
2-Nitrophenol	0	0		0	1,600	1,600	2,913	
4-Nitrophenol	0	0		0	470	470	856	
p-Chloro-m-Cresol	0	0		0	500	500	910	
Pentachlorophenol	0	0		0	14.954	15.0	27.2	
Phenol	0	0		0	N/A	N/A	N/A	
2,4,6-Trichlorophenol	0	0		0	91	91.0	166	
Acenaphthene	0	0		0	17	17.0	30.9	
Anthracene	0	0		0	N/A	N/A	N/A	
Benzidine	0	0		0	59	59.0	107	
Benzo(a)Anthracene	0	0		0	0.1	0.1	0.18	
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	10,923	
Bis(2-Chloroisopropyl)Ether	0	0		0	N/A	N/A	N/A	
Bis(2-Ethylhexyl)Phthalate	0	0		0	910	910	1,657	
4-Bromophenyl Phenyl Ether	0	0		0	54	54.0	98.3	
Butyl Benzyl Phthalate	0	0		0	35	35.0	63.7	
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	291	
1,3-Dichlorobenzene	0	0		0	69	69.0	126	
1,4-Dichlorobenzene	0	0		0	150	150	273	
3,3-Dichlorobenzidine	0	0		0	N/A	N/A	N/A	
Diethyl Phthalate	0	0		0	800	800	1,456	
Dimethyl Phthalate	0	0		0	500	500	910	
Di-n-Butyl Phthalate	0	0		0	21	21.0	38.2	
2,4-Dinitrotoluene	0	0		0	320	320	583	
2,6-Dinitrotoluene	0	0		0	200	200	364	
1,2-Diphenylhydrazine	0	0		0	3	3.0	5.46	
Fluoranthene	0	0		0	40	40.0	72.8	
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	3.64	
Hexachlorocyclopentadiene	0	0		0	1	1.0	1.82	
Hexachloroethane	0	0		0	12	12.0	21.8	
Indeno(1,2,3-cd)Pyrene	0	0		0	N/A	N/A	N/A	
Isophorone	0	0		0	2,100	2,100	3,823	
Naphthalene	0	0		0	43	43.0	78.3	
Nitrobenzene	0	0		0	810	810	1,475	
n-Nitrosodimethylamine	0	0		0	3,400	3,400	6,190	
n-Nitrosodi-n-Propylamine	0	0		0	N/A	N/A	N/A	
n-Nitrosodiphenylamine	0	0		0	59	59.0	107	
Phenanthrene	0	0		0	1	1.0	1.82	

Pyrene	0	0		0	N/A	N/A	N/A	
1,2,4-Trichlorobenzene	0	0		0	26	26.0	47.3	

☑ ***THH*** CCT (min): 0.330 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
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	10.2	
Total Arsenic	0	0		0	10	10.0	18.2	
Total Barium	0	0		0	2,400	2,400	4,369	
Total Boron	0	0		0	3,100	3,100	5,643	
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	7.28	
Dissolved Iron	0	0		0	300	300	546	
Total Iron	0	0		0	N/A	N/A	N/A	
Total Lead	0	0		0	N/A	N/A	N/A	
Total Manganese	0	0		0	1,000	1,000	1,820	
Total Mercury	0	0		0	0.050	0.05	0.091	
Total Nickel	0	0		0	610	610	1,110	
Total Phenols (Phenolics) (PWS)	0	0		0	5	5.0	N/A	
Total Selenium	0	0		0	N/A	N/A	N/A	
Total Silver	0	0		0	N/A	N/A	N/A	
Total Thallium	0	0		0	0.24	0.24	0.44	
Total Zinc	0	0		0	N/A	N/A	N/A	
Acrolein	0	0		0	3	3.0	5.46	
Acrylamide	0	0		0	N/A	N/A	N/A	
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	182	
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	10.4	
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	60.1	
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	124	
Methyl Bromide	0	0		0	100	100.0	182	

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	104	
1,2-trans-Dichloroethylene	0	0		0	100	100.0	182	
1,1,1-Trichloroethane	0	0		0	10,000	10,000	18,205	
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	54.6	
2,4-Dichlorophenol	0	0		0	10	10.0	18.2	
2,4-Dimethylphenol	0	0		0	100	100.0	182	
4,6-Dinitro-o-Cresol	0	0		0	2	2.0	3.64	
2,4-Dinitrophenol	0	0		0	10	10.0	18.2	
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	7,282	
2,4,6-Trichlorophenol	0	0		0	N/A	N/A	N/A	
Acenaphthene	0	0		0	70	70.0	127	
Anthracene	0	0		0	300	300	546	
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	364	
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	0.18	
2-Chloronaphthalene	0	0		0	800	800	1,456	
Chrysene	0	0		0	N/A	N/A	N/A	
Dibenzo(a,h)Anthrancene	0	0		0	N/A	N/A	N/A	
1,2-Dichlorobenzene	0	0		0	1,000	1,000	1,820	
1,3-Dichlorobenzene	0	0		0	7	7.0	12.7	
1,4-Dichlorobenzene	0	0		0	300	300	546	
3,3-Dichlorobenzidine	0	0		0	N/A	N/A	N/A	
Diethyl Phthalate	0	0		0	600	600	1,092	
Dimethyl Phthalate	0	0		0	2,000	2,000	3,641	
Di-n-Butyl Phthalate	0	0		0	20	20.0	36.4	
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	36.4	

Fluorene	0	0		0	50	50.0	91.0	
Hexachlorobenzene	0	0		0	N/A	N/A	N/A	
Hexachlorobutadiene	0	0		0	N/A	N/A	N/A	
Hexachlorocyclopentadiene	0	0		0	4	4.0	7.28	
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	61.9	
Naphthalene	0	0		0	N/A	N/A	N/A	
Nitrobenzene	0	0		0	10	10.0	18.2	
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	36.4	
1,2,4-Trichlorobenzene	0	0		0	0.07	0.07	0.13	

☑ ***CRL*** CCT (min): 0.493 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
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	
Acrylamide	0	0		0	0.07	0.07	0.48	
Acrylonitrile	0	0		0	0.06	0.06	0.41	
Benzene	0	0		0	0.58	0.58	4.0	

Bromoform	0	0		0	7	7.0	48.3	
Carbon Tetrachloride	0	0		0	0.4	0.4	2.76	
Chlorobenzene	0	0		0	N/A	N/A	N/A	
Chlorodibromomethane	0	0		0	0.8	0.8	5.52	
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	6.56	
1,2-Dichloroethane	0	0		0	9.9	9.9	68.3	
1,1-Dichloroethylene	0	0		0	N/A	N/A	N/A	
1,2-Dichloropropane	0	0		0	0.9	0.9	6.21	
1,3-Dichloropropylene	0	0		0	0.27	0.27	1.86	
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	138	
1,1,2,2-Tetrachloroethane	0	0		0	0.2	0.2	1.38	
Tetrachloroethylene	0	0		0	10	10.0	69.0	
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	3.8	
Trichloroethylene	0	0		0	0.6	0.6	4.14	
Vinyl Chloride	0	0		0	0.02	0.02	0.14	
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	0.21	
Phenol	0	0		0	N/A	N/A	N/A	
2,4,6-Trichlorophenol	0	0		0	1.5	1.5	10.4	
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	0.0007	
Benzo(a)Anthracene	0	0		0	0.001	0.001	0.007	
Benzo(a)Pyrene	0	0		0	0.0001	0.0001	0.0007	
3,4-Benzofluoranthene	0	0		0	0.001	0.001	0.007	
Benzo(k)Fluoranthene	0	0		0	0.01	0.01	0.069	
Bis(2-Chloroethyl)Ether	0	0		0	0.03	0.03	0.21	
Bis(2-Chloroisopropyl)Ether	0	0		0	N/A	N/A	N/A	
Bis(2-Ethylhexyl)Phthalate	0	0		0	0.32	0.32	2.21	
4-Bromophenyl Phenyl Ether	0	0		0	N/A	N/A	N/A	
Butyl Benzyl Phthalate	0	0		0	N/A	N/A	N/A	
2-Chloronaphthalene	0	0		0	N/A	N/A	N/A	

Chrysene	0	0		0	0.12	0.12	0.83	
Dibenzo(a,h)Anthrancene	0	0		0	0.0001	0.0001	0.0007	
1,2-Dichlorobenzene	0	0		0	N/A	N/A	N/A	
1,3-Dichlorobenzene	0	0		0	N/A	N/A	N/A	
1,4-Dichlorobenzene	0	0		0	N/A	N/A	N/A	
3,3-Dichlorobenzidine	0	0		0	0.05	0.05	0.35	
Diethyl Phthalate	0	0		0	N/A	N/A	N/A	
Dimethyl Phthalate	0	0		0	N/A	N/A	N/A	
Di-n-Butyl Phthalate	0	0		0	N/A	N/A	N/A	
2,4-Dinitrotoluene	0	0		0	0.05	0.05	0.35	
2,6-Dinitrotoluene	0	0		0	0.05	0.05	0.35	
1,2-Diphenylhydrazine	0	0		0	0.03	0.03	0.21	
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	0.0006	
Hexachlorobutadiene	0	0		0	0.01	0.01	0.069	
Hexachlorocyclopentadiene	0	0		0	N/A	N/A	N/A	
Hexachloroethane	0	0		0	0.1	0.1	0.69	
Indeno(1,2,3-cd)Pyrene	0	0		0	0.001	0.001	0.007	
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	0.005	
n-Nitrosodi-n-Propylamine	0	0		0	0.005	0.005	0.035	
n-Nitrosodiphenylamine	0	0		0	3.3	3.3	22.8	
Phenanthrene	0	0		0	N/A	N/A	N/A	
Pyrene	0	0		0	N/A	N/A	N/A	
1,2,4-Trichlorobenzene	0	0		0	N/A	N/A	N/A	

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

No. Samples/Month: 4

	Mass Limits		*Concentration Limits*						
Pollutants	AML (lbs/day)	MDL (lbs/day)	AML	MDL	IMAX	Units	Governing WQBEL	WQBEL Basis	Comments
Total Aluminum	Report	Report	Report	Report	Report	µg/L	875	AFC	Discharge Conc > 10% WQBEL (no RP)
Total Cadmium	Report	Report	Report	Report	Report	µg/L	0.72	CFC	Discharge Conc > 10% WQBEL (no RP)
Hexavalent Chromium	Report	Report	Report	Report	Report	µg/L	18.9	CFC	Discharge Conc > 10% WQBEL (no RP)
Total Copper	0.22	0.35	0.026	0.041	0.066	mg/L	0.026	CFC	Discharge Conc ≥ 50% WQBEL (RP)
Free Cyanide	0.062	0.097	7.28	11.4	18.2	µg/L	7.28	THH	Discharge Conc ≥ 50% WQBEL (RP)
Total Zinc	Report	Report	Report	Report	Report	mg/L	0.22	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
Bromide	N/A	N/A	No WQS
Sulfate (PWS)	N/A	N/A	PWS Not Applicable
Total Antimony	10.2	µg/L	Discharge Conc ≤ 10% WQBEL
Total Arsenic	18.2	µg/L	Discharge Conc ≤ 10% WQBEL
Total Barium	4,369	µg/L	Discharge Conc ≤ 10% WQBEL
Total Beryllium	N/A	N/A	No WQS
Total Boron	2,913	µg/L	Discharge Conc ≤ 10% WQBEL
Total Chromium (III)	238	µg/L	Discharge Conc ≤ 10% WQBEL
Total Cobalt	34.6	µg/L	Discharge Conc < TQL
Total Cyanide	N/A	N/A	No WQS
Dissolved Iron	546	µg/L	Discharge Conc ≤ 10% WQBEL
Total Iron	2,731	µg/L	Discharge Conc ≤ 10% WQBEL
Total Lead	11.1	µg/L	Discharge Conc < TQL
Total Manganese	1,820	µg/L	Discharge Conc ≤ 10% WQBEL
Total Mercury	0.091	µg/L	Discharge Conc < TQL
Total Nickel	146	µg/L	Discharge Conc ≤ 10% WQBEL
Total Phenols (Phenolics) (PWS)		µg/L	Discharge Conc < TQL
Total Selenium	9.08	µg/L	Discharge Conc < TQL
Total Silver	10.6	µg/L	Discharge Conc ≤ 10% WQBEL
Total Thallium	0.44	µg/L	Discharge Conc < TQL
Total Molybdenum	N/A	N/A	No WQS
Acrolein	3.5	µg/L	Discharge Conc < TQL
Acrylamide	0.48	µg/L	Discharge Conc < TQL
Acrylonitrile	0.41	µg/L	Discharge Conc < TQL
Benzene	4.0	µg/L	Discharge Conc < TQL
Bromoform	48.3	µg/L	Discharge Conc < TQL
Carbon Tetrachloride	2.76	µg/L	Discharge Conc < TQL
Chlorobenzene	182	µg/L	Discharge Conc < TQL
Chlorodibromomethane	5.52	µg/L	Discharge Conc < TQL
Chloroethane	N/A	N/A	No WQS
2-Chloroethyl Vinyl Ether	6,372	µg/L	Discharge Conc < TQL
Chloroform	10.4	µg/L	Discharge Conc ≤ 25% WQBEL
Dichlorobromomethane	6.56	µg/L	Discharge Conc ≤ 25% WQBEL
1,1-Dichloroethane	N/A	N/A	No WQS
1,2-Dichloroethane	68.3	µg/L	Discharge Conc < TQL
1,1-Dichloroethylene	60.1	µg/L	Discharge Conc < TQL
1,2-Dichloropropane	6.21	µg/L	Discharge Conc < TQL
1,3-Dichloropropylene	1.86	µg/L	Discharge Conc < TQL
1,4-Dioxane	N/A	N/A	No WQS

Ethylbenzene	124	µg/L	Discharge Conc < TQL
Methyl Bromide	182	µg/L	Discharge Conc < TQL
Methyl Chloride	10,013	µg/L	Discharge Conc < TQL
Methylene Chloride	138	µg/L	Discharge Conc < TQL
1,1,2,2-Tetrachloroethane	1.38	µg/L	Discharge Conc < TQL
Tetrachloroethylene	69.0	µg/L	Discharge Conc < TQL
Toluene	104	µg/L	Discharge Conc ≤ 25% WQBEL
1,2-trans-Dichloroethylene	182	µg/L	Discharge Conc < TQL
1,1,1-Trichloroethane	1,110	µg/L	Discharge Conc < TQL
1,1,2-Trichloroethane	3.8	µg/L	Discharge Conc < TQL
Trichloroethylene	4.14	µg/L	Discharge Conc < TQL
Vinyl Chloride	0.14	µg/L	Discharge Conc < TQL
2-Chlorophenol	54.6	µg/L	Discharge Conc < TQL
2,4-Dichlorophenol	18.2	µg/L	Discharge Conc < TQL
2,4-Dimethylphenol	182	µg/L	Discharge Conc < TQL
4,6-Dinitro-o-Cresol	3.64	µg/L	Discharge Conc < TQL
2,4-Dinitrophenol	18.2	µg/L	Discharge Conc < TQL
2-Nitrophenol	2,913	µg/L	Discharge Conc < TQL
4-Nitrophenol	856	µg/L	Discharge Conc < TQL
p-Chloro-m-Cresol	187	µg/L	Discharge Conc < TQL
Pentachlorophenol	0.21	µg/L	Discharge Conc < TQL
Phenol	7,282	µg/L	Discharge Conc < TQL
2,4,6-Trichlorophenol	10.4	µg/L	Discharge Conc < TQL
Acenaphthene	30.9	µg/L	Discharge Conc < TQL
Acenaphthylene	N/A	N/A	No WQS
Anthracene	546	µg/L	Discharge Conc < TQL
Benzidine	0.0007	µg/L	Discharge Conc < TQL
Benzo(a)Anthracene	0.007	µg/L	Discharge Conc < TQL
Benzo(a)Pyrene	0.0007	µg/L	Discharge Conc < TQL
3,4-Benzofluoranthene	0.007	µg/L	Discharge Conc < TQL
Benzo(ghi)Perylene	N/A	N/A	No WQS
Benzo(k)Fluoranthene	0.069	µg/L	Discharge Conc < TQL
Bis(2-Chloroethoxy)Methane	N/A	N/A	No WQS
Bis(2-Chloroethyl)Ether	0.21	µg/L	Discharge Conc < TQL
Bis(2-Chloroisopropyl)Ether	364	µg/L	Discharge Conc < TQL
Bis(2-Ethylhexyl)Phthalate	2.21	µg/L	Discharge Conc < TQL
4-Bromophenyl Phenyl Ether	98.3	µg/L	Discharge Conc < TQL
Butyl Benzyl Phthalate	0.18	µg/L	Discharge Conc < TQL
2-Chloronaphthalene	1,456	µg/L	Discharge Conc < TQL
4-Chlorophenyl Phenyl Ether	N/A	N/A	No WQS
Chrysene	0.83	µg/L	Discharge Conc < TQL
Dibenzo(a,h)Anthrancene	0.0007	µg/L	Discharge Conc < TQL
1,2-Dichlorobenzene	291	µg/L	Discharge Conc < TQL
1,3-Dichlorobenzene	12.7	µg/L	Discharge Conc < TQL
1,4-Dichlorobenzene	273	µg/L	Discharge Conc < TQL
3,3-Dichlorobenzidine	0.35	µg/L	Discharge Conc < TQL
Diethyl Phthalate	1,092	µg/L	Discharge Conc < TQL

Dimethyl Phthalate	910	µg/L	Discharge Conc < TQL
Di-n-Butyl Phthalate	36.4	µg/L	Discharge Conc < TQL
2,4-Dinitrotoluene	0.35	µg/L	Discharge Conc < TQL
2,6-Dinitrotoluene	0.35	µg/L	Discharge Conc < TQL
Di-n-Octyl Phthalate	N/A	N/A	No WQS
1,2-Diphenylhydrazine	0.21	µg/L	Discharge Conc < TQL
Fluoranthene	36.4	µg/L	Discharge Conc < TQL
Fluorene	91.0	µg/L	Discharge Conc < TQL
Hexachlorobenzene	0.0006	µg/L	Discharge Conc < TQL
Hexachlorobutadiene	0.069	µg/L	Discharge Conc < TQL
Hexachlorocyclopentadiene	1.82	µg/L	Discharge Conc < TQL
Hexachloroethane	0.69	µg/L	Discharge Conc ≤ 25% WQBEL
Indeno(1,2,3-cd)Pyrene	0.007	µg/L	Discharge Conc < TQL
Isophorone	61.9	µg/L	Discharge Conc < TQL
Naphthalene	78.3	µg/L	Discharge Conc ≤ 25% WQBEL
Nitrobenzene	18.2	µg/L	Discharge Conc < TQL
n-Nitrosodimethylamine	0.005	µg/L	Discharge Conc < TQL
n-Nitrosodi-n-Propylamine	0.035	µg/L	Discharge Conc < TQL
n-Nitrosodiphenylamine	22.8	µg/L	Discharge Conc < TQL
Phenanthrene	1.82	µg/L	Discharge Conc < TQL
Pyrene	36.4	µg/L	Discharge Conc < TQL
1,2,4-Trichlorobenzene	0.13	µg/L	Discharge Conc < TQL

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Toxics Management Spreadsheet
Version 1.3, March 2021

Discharge Information

Instructions | Discharge | Stream

Facility: **Pigeon Creek Sanitary Authority** NPDES Permit No.: **PA0044679** 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
1.02	100	7.8						

	Discharge Pollutant	Units	Max Discharge Conc		0 if left blank: Trib Conc	Stream Conc	0.5 if left blank: Daily CV	Hourly CV	0 if left blank: Stream CV	Fate Coeff	FOS	1 if left blank: Criteria Mod	Chem Transl
Group 1	Total Dissolved Solids (PWS)	mg/L											
	Chloride (PWS)	mg/L		897									
	Bromide	mg/L		0.1									
	Sulfate (PWS)	mg/L		11.2									
	Fluoride (PWS)	mg/L											
Group 2	Total Aluminum	µg/L	<	100									
	Total Antimony	µg/L		1									
	Total Arsenic	µg/L		1									
	Total Barium	µg/L		42									
	Total Beryllium	µg/L	<	0.4									
	Total Boron	µg/L		238									
	Total Cadmium	µg/L		0.3									
	Total Chromium (III)	µg/L	<	5									
	Hexavalent Chromium	µg/L	<	5									
	Total Cobalt	µg/L	<	1									
	Total Copper	µg/L		5									
	Free Cyanide	µg/L		13									
	Total Cyanide	µg/L		11									
	Dissolved Iron	µg/L		41									
	Total Iron	µg/L	<	100									
	Total Lead	µg/L	<	1									
	Total Manganese	µg/L		62									
	Total Mercury	µg/L	<	0.2									
	Total Nickel	µg/L		3									
	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		66									
	Total Molybdenum	µg/L		3									
	Acrolein	µg/L	<	1									
	Acrylamide	µg/L	<	0.5									
	Acrylonitrile	µg/L	<	0.5									
	Benzene	µg/L	<	0.5									
	Bromoform	µg/L	<	0.5									
	Carbon Tetrachloride	µg/L	<	0.5									
	Chlorobenzene	µg/L	<	0.5									

Group 3	Chlorodibromomethane	µg/L	<	0.5									
	Chloroethane	µg/L	<	0.5									
	2-Chloroethyl Vinyl Ether	µg/L	<	0.5									
	Chloroform	µg/L		5.6									
	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	<	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		1									
	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									
	2,4-Dichlorophenol	µg/L	<	1									
	2,4-Dimethylphenol	µg/L	<	1									
	4,6-Dinitro-o-Cresol	µg/L	<	1									
	2,4-Dinitrophenol	µg/L	<	3									
	2-Nitrophenol	µg/L	<	1									
	4-Nitrophenol	µg/L	<	1									
	p-Chloro-m-Cresol	µg/L	<	1									
	Pentachlorophenol	µg/L	<	1									
	Phenol	µg/L	<	1									
	2,4,6-Trichlorophenol	µg/L	<	1									
Group 5	Acenaphthene	µg/L	<	1									
	Acenaphthylene	µg/L	<	1									
	Anthracene	µg/L	<	1									
	Benzidine	µg/L	<	5									
	Benzo(a)Anthracene	µg/L	<	1									
	Benzo(a)Pyrene	µg/L	<	1									
	3,4-Benzofluoranthene	µg/L	<	1									
	Benzo(ghi)Perylene	µg/L	<	1									
	Benzo(k)Fluoranthene	µg/L	<	1									
	Bis(2-Chloroethoxy)Methane	µg/L	<	1									
	Bis(2-Chloroethyl)Ether	µg/L	<	1									
	Bis(2-Chloroisopropyl)Ether	µg/L	<	1									
	Bis(2-Ethylhexyl)Phthalate	µg/L	<	3									
	4-Bromophenyl Phenyl Ether	µg/L	<	1									
	Butyl Benzyl Phthalate	µg/L	<	1									
	2-Chloronaphthalene	µg/L	<	1									
	4-Chlorophenyl Phenyl Ether	µg/L	<	1									
	Chrysene	µg/L	<	1									
	Dibenzo(a,h)Anthrancene	µg/L	<	1									
	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		0.56									
	Diethyl Phthalate	µg/L	<	1									
	Dimethyl Phthalate	µg/L	<	1									
	Di-n-Butyl Phthalate	µg/L	<	3									
	2,4-Dinitrotoluene	µg/L	<	1									
	2,6-Dinitrotoluene	µg/L	<	1									
	Di-n-Octyl Phthalate	µg/L	<	3									
	1,2-Diphenylhydrazine	µg/L	<	3									

	Fluoranthene	µg/L	<	1									
	Fluorene	µg/L	<	1									
	Hexachlorobenzene	µg/L	<	1									
	Hexachlorobutadiene	µg/L	<	1									
	Hexachlorocyclopentadiene	µg/L	<	1									
	Hexachloroethane	µg/L		0.113									
	Indeno(1,2,3-cd)Pyrene	µg/L	<	1									
	Isophorone	µg/L	<	1									
	Naphthalene	µg/L	<	1									
	Nitrobenzene	µg/L	<	1									
	n-Nitrosodimethylamine	µg/L	<	1									
	n-Nitrosodi-n-Propylamine	µg/L	<	1									
	n-Nitrosodiphenylamine	µg/L	<	1									
	Phenanthrene	µg/L	<	1									
	Pyrene	µg/L	<	1									
	1,2,4-Trichlorobenzene	µg/L	<	1									
Group 6	Aldrin	µg/L	<										
	alpha-BHC	µg/L	<										
	beta-BHC	µg/L	<										
	gamma-BHC	µg/L	<										
	delta BHC	µg/L	<										
	Chlordane	µg/L	<										
	4,4-DDT	µg/L	<										
	4,4-DDE	µg/L	<										
	4,4-DDD	µg/L	<										
	Dieldrin	µg/L	<										
	alpha-Endosulfan	µg/L	<										
	beta-Endosulfan	µg/L	<										
	Endosulfan Sulfate	µg/L	<										
	Endrin	µg/L	<										
	Endrin Aldehyde	µg/L	<										
	Heptachlor	µg/L	<										
	Heptachlor Epoxide	µg/L	<										
	PCB-1016	µg/L	<										
	PCB-1221	µg/L	<										
	PCB-1232	µg/L	<										
	PCB-1242	µg/L	<										
	PCB-1248	µg/L	<										
	PCB-1254	µg/L	<										
	PCB-1260	µg/L	<										
	PCBs, Total	µg/L	<										
	Toxaphene	µg/L	<										
	2,3,7,8-TCDD	ng/L	<										
Group 7	Gross Alpha	pCi/L											
	Total Beta	pCi/L	<										
	Radium 226/228	pCi/L	<										
	Total Strontium	µg/L	<										
	Total Uranium	µg/L	<										
	Osmotic Pressure	mOs/kg											

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Toxics Management Spreadsheet
Version 1.3, March 2021

Stream / Surface Water Information

Pigeon Creek Sanitary Authority, NPDES Permit No. PA0044679, Outfall 001

Instructions | Discharge | Stream

Receiving Surface Water Name: **Pigeon 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	039637	8.9	1100	41.6	0.0045		Yes
End of Reach 1	039637	8	1078.4	49	0.0045		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	8.9	0.0315			10							248	7.8		
End of Reach 1	8	0.0315			10							248	7.8		

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	8.9														
End of Reach 1	8														

Cause and Effect Survey

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

MEMO

TO James Vanek
Environmental Engineer
Clean Water Program

FROM Jamie Detweiler
Aquatic Biologist 2
Clean Water Program

THROUGH Richard Spear
Aquatic Biologist 3
Clean Water Program

DATE January 24, 2022

RE Cause and Effect Survey
Pigeon Creek
State Water Plan: 19C
Hydrologic Unit Code: 05020005
Stream Code: 39637
Aquatic Life Use Designation: WWF
Pigeon Creek Sanitary Authority Pigeon Creek Sewage Treatment Plant
Fallowfield Township, Washington County

INTRODUCTION

On May 6, 2021, at the request of James Vanek of the Clean Water Program, a cause and effect survey was conducted on Pigeon Creek, in the vicinity of the Pigeon Creek Sewage Treatment Plant (Pigeon Creek STP), located in Fallowfield Township, Washington County (Figure 1). The previous data collection and assessment efforts indicate that this reach of Pigeon Creek is currently attaining protected uses as described in the latest 2022 Pennsylvania Integrated Water Quality Monitoring and Assessment Report.

The Pigeon Creek STP outfall is located at approximately Latitude: 40.139227, Longitude: -79.987962. The water discharges to Pigeon Creek along its right descending bank (Figure 2).

According to USGS Stream Stats, at the location where the outfall is located, the drainage area is approximately 41.1 square miles (Figure 3). Land use throughout the basin is approximately 40% forested and approximately 13% urban, and approximately 2% impervious. According to the aerial, the rest of the watershed appears to be agriculture (approximately 45%) and open water (approximately 2%). Pigeon Creek is in the Middle Monongahela River State Water Plan (SWP 19C) and the Lower Monongahela Hydrologic Unit (Hydrologic Unit Code 05020005). Currently, Pigeon Creek (Stream Code 39637) is listed as attaining its designated Aquatic Life Use for Warm Water Fishery (WWF).

SAMPLING PROTOCOL

Cause and effect surveys are designed to investigate possible relationships between point or nonpoint sources of conventional pollutants and known or suspected instream water quality problems.

On May 6, 2021, basic water quality (Table 1) and macroinvertebrates (Table 2) were examined at two locations within Pigeon Creek (Figure 2). The upstream site was located approximately 100 meters upstream of where the Pigeon Creek STP's discharge enters Pigeon Creek (Figures 4 & 5). The downstream location was approximately 75 meters downstream of the outfall location (Figures 6 & 7).

Basic water quality parameters were examined using a field meter and additional water chemistry and macroinvertebrates were collected and subsampled according to the Department's Water Quality Monitoring Protocols for Streams and Rivers 2018 (Monitoring Book), which can be found by following this link: http://files.dep.state.pa.us/Water/Drinking%20Water%20and%20Facility%20Regulation/WaterQualityPortalFiles/Technical%20Documentation/MONITORING_BOOK.pdf

The results were analyzed according to the Department's Assessment Methodology for Rivers and Streams 2018 (Assessment Book), which can be found by following this link: http://files.dep.state.pa.us/Water/Drinking%20Water%20and%20Facility%20Regulation/WaterQualityPortalFiles/Methodology/2015%20Methodology/Assessment_Book.pdf

RESULTS

Upstream station

The upstream station was located approximately 100 meters upstream of where the STP's discharge enters Pigeon Creek. At this location, the stream has a very thin forested riparian zone on the right descending bank, with a road along the stream. The left descending bank is mostly forested. pH taken with the field meter was 7.9, the temperature was 10.6°C, dissolved oxygen was 10.83 mg/L, and specific conductance was 611 umhos/cm. The habitat score was 171, which consisted of optimal and sub optimal scores. The lowest score was due to the condition of the banks.

The macroinvertebrate subsample contained 197 individuals. To get this number, material collected from the stream was put into a pan with 28 grids. Material from 4 of the grids was moved into a second pan with 28 grids. Material from 8 grids of the 2nd pan were searched for organisms. A total of 15 taxa were identified, with the dominant taxa being Chironomids. Three mayfly taxa, three stonefly taxa, and one caddisfly taxa were found in the sample. At this location, we considered Pigeon Creek to be a large stream, so the Index of Biotic Integrity (IBI) was 30.9.

None of the water quarter quality parameters exceeded the Chapter 93 Water Quality Criteria at the upstream station. Total phosphorus was 0.057mg/L and dissolved phosphorus was 0.026.

Downstream Station

The downstream station was located approximately 75 meters downstream of where the STP's discharge enters Pigeon Creek, but the macroinvertebrate sampling extended to downstream of Bentlyville Road. At this station, the stream has a very thin forested riparian zone and with roads along both banks, and the wastewater treatment

plant is on its right descending bank. pH taken with the field meter was 7.78, the temperature was 10.6°C, dissolved oxygen was 10.76 mg/L, and specific conductance was 616 umhos/cm. The habitat score was 185, which consisted of optimal, sub optimal, and marginal scores. The lowest scores were due to sediment deposition, disruptive pressure, and riparian zone.

The macroinvertebrate subsample contained 220 individuals. To get this number, material collected from the stream was put into a pan with 28 grids. Material from 4 of the grids was moved into a second pan with 28 grids. Material from 4 grids of the 2nd pan were searched. A total of 10 taxa were identified. The dominant taxa were Oligochaeta (63.6%) and Chironomidae (27.3%). One Trichoptera taxa was collected and two Ephemera taxa were collected. No Plecoptera were collected. The IBI score was 14.8, which is more than the intersite precision estimate of 9 points from the upstream score. Therefore, the difference in scores may imply that the STP outfall is having a measurable impact on the aquatic community.

None of the water quarter quality parameters exceeded the Chapter 93 Water Quality Criteria at the downstream station. The total dissolved phosphorus at this site was 0.08 mg/L and the total phosphorus was 0.082 mg/L.

DISCUSSION AND CONCLUSIONS

The objective of this survey was to determine if the discharge from the Pigeon Creek STP is affecting the aquatic life, water quality, and/or physical characteristics of Pigeon Creek.

Findings from this survey suggest that the aquatic life is possibly being affected by the STP. The difference between the upstream and downstream IBI scores was greater than the intersite precision estimate. The percentage of oligochaetes is also much higher at the downstream station. The total and dissolved phosphorus levels are higher downstream of the STP than they are upstream. In addition, the ratio of dissolved to total phosphorus is higher downstream. The decrease in IBI score, the increase in percentage of oligochaetes, and increased phosphorus at the downstream location all indicate that the STP is negatively impacting the stream.

Furthermore, the results from this survey indicate that Pigeon Creek is not attaining its Chapter 93 Aquatic Life Use, and that the Pigeon Creek STP may be further degrading the stream. We are further examining the length of the impact and other sources and causes of impairment.

cc: Stream File – Pigeon Creek
Stacey Greenwald – SWRO, Environmental Group Manager
Mahbuba Iasmin – SWRO, Environmental Group Manager
Christopher Kriley – SWRO, Environmental Program Manager
Michael Lookenbill – CO, Environmental Group Manager
William Brown – CO, Environmental Group Manager

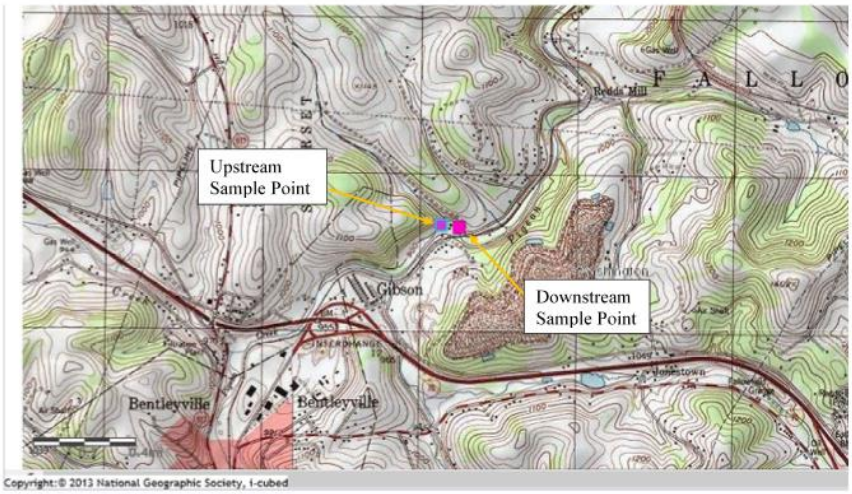


Figure 1. United States Geological Survey Topographic Map showing the location of the Pigeon Creek STP outfall location and the sampling sites.

Figure 2. Map of Pigeon Creek STP outfall location, sampling locations, and Pigeon Creek.

StreamStats Report

Region ID:	PA
Workspace ID:	PA20211026143951350000
Clicked Point (Latitude, Longitude):	40.13924, -79.98800
Time:	2021-10-26 10:40:14 -0400

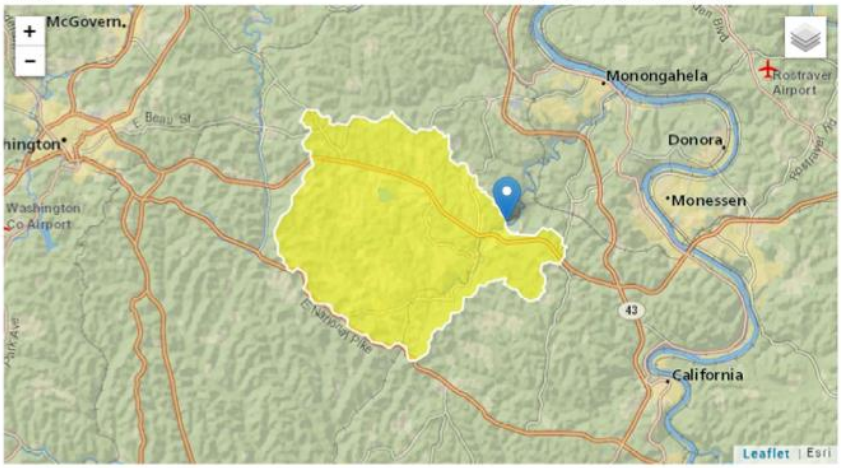


Figure 3. USGS Streamstats delineation of the drainage area to the point where Pigeon Creek STP discharges to Pigeon Creek.

Table 1. Water quality parameters from Pigeon Creek at the survey locations, upstream and downstream of the Sewage Treatment Plant.

Test	Units	Upstream Result	Upstream Comment	Down-stream result	Downstream Comment
Time		10:00		9:30	
Sequence Number		309		308	
DISSOLVED OXYGEN - FIELD BY MEMBRANE ELECTRODE****	mg/L	10.83		10.76	
PH - FIELD****	pH units	7.9		7.78	
Specific Conductance - Field	Umhos /cm	611		616	
TEMPERATURE - FIELD - THERMOMETRIC****	C	10.6		10.6	

Test	Units	Upstream Result	Upstream Comment	Down-stream result	Downstream Comment
ALKALINITY AS CaCO3 @ pH 4.5	mg/L	31.2		153.6	
ALUMINUM, DISSOLVED (WATER & WASTE) BY ICPMS	ug/L	21.3		21.9	
ALUMINUM, TOTAL (WATER & WASTE) ICPMS	ug/L	495		387	
AMMONIA DISSOLVED AS NITROGEN	mg/L	0.064		0.067	
AMMONIA TOTAL AS NITROGEN	mg/L	0.06		0.04	
BARIUM, TOTAL (WATER & WASTE) BY ICP	ug/L	68		68	
BORON, TOTAL (WATER & WASTE) BY ICP	ug/L	<200		<200	
CADMIUM, DISSOLVED (WATER & WASTE) BY ICPMS	ug/L	<0.2		<0.2	
CALCIUM, TOTAL (WATER & WASTE) BY ICP	mg/L	71.79		71.89	
COPPER, DISSOLVED (WATER & WASTE) BY ICPMS	ug/L	<4		<4	
COPPER, TOTAL (WATER & WASTE) BY ICPMS	ug/L	<4		<4	
Dissolve Nitrate & Nitrite Nitrogen	mg/L	0.51		0.6	
Dissolve Ortho Phosphorus	mg/L	0.03	Answer Rechecked By Analyst	0.05	Answer Rechecked By Analyst
Dissolved Nitrogen as N	mg/L	1.251	Dissolved result is > Total result by more than 10%	1.23	Dissolved result > Total result by more than 10%
Dissolved Phosphorus as P	mg/L	0.026	Answer Rechecked By Analyst	0.08	
HARDNESS, TOTAL (CALCULATED)	mg/L	248	Accredited by NJ only - accreditation not available from PA	248	Accredited by NJ only - accreditation not available from PA
IRON, DISSOLVED (WATER & WASTE) BY ICP	ug/L	<100		<100	
IRON, TOTAL (WATER & WASTE) BY ICP	ug/L	1306		968	
LEAD, DISSOLVED (WATER & WASTE) BY ICPMS	ug/L	<1		<1	
LEAD, TOTAL (WATER & WASTE) BY ICPMS	ug/L	<1		<1	
LITHIUM, DISSOLVED (WATER &WASTE) BY ICP	ug/L	<25		<25	

Test	Units	Upstream Result	Upstream Comment	Down-stream result	Downstream Comment
LITHIUM, TOTAL (WATER & WASTE) BY ICP	ug/L	<25		<25	
Low Bromide by IC	ug/L	43.47		43.36	
MAGNESIUM, TOTAL (WATER & WASTE) BY ICP	mg/L	16.6		16.67	
MANGANESE, DISSOLVED (WATER & WASTE) BY ICP	ug/L	30		26	
MANGANESE, TOTAL (WATER & WASTE) BY ICP	ug/L	130		104	
NICKEL, DISSOLVED (WATER & WASTE) BY ICP	ug/L	<50		<50	
NICKEL, TOTAL (WATER & WASTE) BY ICP	ug/L	<50		<50	
OSMOTIC PRESSURE, MOSM/KG	Mosm /kg	8		8	
pH, Lab (Electrometric)	pH units	6.9	Holding Time Exceeded	8.2	Holding Time Exceeded
POTASSIUM, TOTAL (WATER & WASTE) BY ICP	mg/L	2.59		2.6	
SELENIUM, TOTAL (WATER & WASTE) BY ICPMS	ug/L	<7		<7	
SODIUM, TOTAL (WATER & WASTE) BY ICP	mg/L	30.54		31.65	
SPECIFIC CONDUCTIVITY @ 25.0 C	Umhos /cm	626		631	
STRONTIUM, TOTAL (WATER & WASTE) BY ICP	ug/L	451		453	
Temperature at which pH is measured	C	19.43		19.35	
Total Chloride-Ion Chromatograph	mg/L	38.23		40.31	
TOTAL DISSOLVED SOLIDS @ 180C BY USGS-I-1750	mg/L	372		378	
Total Nitrate & Nitrite Nitrogen	mg/L	0.47		0.59	
Total Nitrogen as N	mg/L	0.91	Dissolved result > Total result by more than 10%	1.02	Dissolved result > Total result by more than 10%
Total Organic Carbon	mg/L	3.62		3.86	
Total Ortho Phosphorus as P	mg/L	0.01	Answer Rechecked By Analyst	0.027	Answer Rechecked By Analyst
Total Phosphorus as P	mg/L	0.057		0.084	
Total Sulfate-Ion Chromatograph	mg/L	109.55		104.99	
TOTAL SUSPENDED SOLIDS	mg/L	14		16	

Test	Units	Upstream Result	Upstream Comment	Down-stream result	Downstream Comment
ZINC, DISSOLVED (WATER & WASTE) BY ICP	ug/L	<30		<30	
ZINC, TOTAL (WATER & WASTE) BY ICP	ug/L	<30		<30	

< indicates result is below reporting limit

Table 2. Aquatic macroinvertebrates observed the sampling locations upstream and downstream of the Pigeon Creek STP outfall.

Taxa Name	Family	Upstream	Downstream
Baetis	Baetidae (Minnow-Like Mayflies)	13	2
Stenacron	Heptageneidae (Flat-headed Mayflies)	1	
Caenis	Caenidae (Square-Gilled Mayflies)	3	1
Taeniopteryx	Taeniopterigidae (Willowflies)	4	
Amphinemura	Nemouridae (Forestflies)	3	
Perlesta	Perlidae (Common Stoneflies)	4	
Hydroptila	Hydroptilidae (Purse Casemaker Caddisflies)	2	2
Psephenus	Psephenidae (Water Pennies)		1
Optioservus	Elmidae (Riffle Beetles)		1
Stenelmis	Elmidae (Riffle Beetles)	11	11
Dicranota	Pediciidae (Hairy-eyed Craneflies)	1	
Simulium	Simulidae (Black Flies)	1	
Probezzia	Ceratopogonidae (Biting Midges)		1
Chironomidae	Chironomidae (Non-biting Midges)	137	60
Corbiculidae	Corbiculidae (Asiatic Clam)	1	
Trepaxonemata	Trepaxonemata (Flatworms)		1
Oligochaeta	Oligochaeta (Segmented Worms	14	140
Gammarus	Gammaridae (Scuds)	1	
Caecidotea	Isopoda (Pill Bugs)	1	
Number of grids picked, Pan 1		4	4
Number of grids picked, Pan 2		8	4
Number organisms in the subsample		187	220
IBI (Large Stream)		30.9	14.8

Figure 4. Sampling location located upstream of the Pigeon Creek STP Outfall, facing upstream.

Figure 5. Sampling location located upstream of the Pigeon Creek STP Outfall, facing downstream.

Figure 6. Sampling location located downstream of the Pigeon Creek STP Outfall, facing upstream.

Figure 7. Sampling location located downstream of the Pigeon Creek STP Outfall, facing downstream.

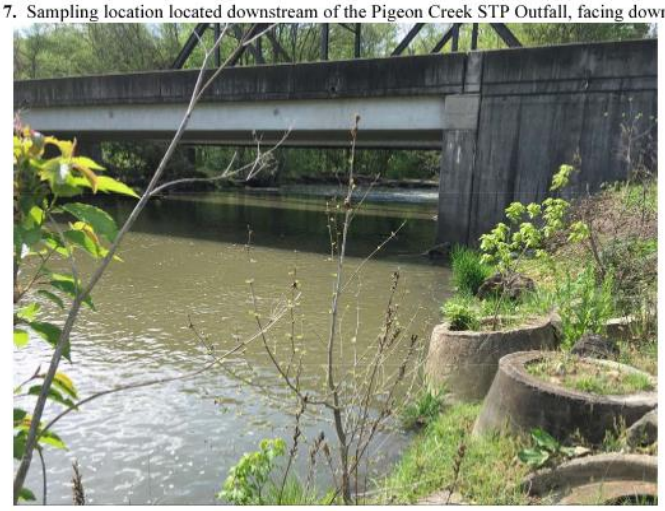


Table 3. Bureau of Clean Water Macroinvertebrate Sample Summary for the location upstream of the Pigeon Creek STP Outfall.

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

BUREAU OF CLEAN WATER
MACROINVERTEBRATE SAMPLE SUMMARY
11/19/2021 1:37:53 PM

Export Taxa to Excel | Export Data to Excel

SAMPLE SUMMARY				
STATION ID: 20210506-1000-jadetweile	SECONDARY STATION ID:	LATITUDE: 40.13896810	LONGITUDE: -79.98887660	
STREAM NAME: Pigeon Creek (01183710)		HUC8 05020005 Lower Monongahela. Pennsylvania, West Virginia.		
SURVEY ID: 73049		METHOD: 6-Dframe Composite, 200 subsample		
SUBSAMPLED BY: Jamie Detweiler	IDENTIFIED BY: Jamie Detweiler	QUALITY ASSURED: N	QUALITY ASSURED BY:	PASSED QUALITY ASSURANCE: N
STATION LOCATION COMMENT: Upstream of STP outfall				
BIOLOGY / HABITAT COMMENT:				
LAND USE COMMENT:				
IMPAIRMENT COMMENT:				

TAXA						
	# grids from first pan = 4		# grids from second pan = 8		Subsample Size =	197
TAXA NAME	INDIVIDUALS	PTV	FFG	BCG COLD	BCG WARM	
Baetis	13	6	CG	4	5	
Stenacron	1	4	SC	4	4	
Caenis	3	7	CG	5	5	
Taeniopteryx	4	2	SH	3	3	
Amphinemura	3	3	SH	3	3	
Perlesta	4	4	PR	3	3	
Hydroptila	2	6	SC	5	5	
Stenelmis	11	5	SC	5	5	
Dicranota	1	3	PR	3	3	
Simulium	1	6	FC	5	5	
Chironomidae	137	6	CG	5	5	
Corbiculidae	1	4	FC	5	5	
Oligochaeta	14	10	CG	5	5	
Gammarus	1	4	CG	4	4	
Caecidotea	1	6	CG	5	5	

METRICS						
		Freestone Riffle-Run 6D200				
METRIC NAME	RAW VALUE	2013 SMALL	2013 LARGE	2D100	MULTIHABITAT POOL GLIDE	LIMESTONE 2009
Total Richness	15	45.5	48.4		48.4	83.3

SSRS_SLIMS_043 Ver 1.1

Page 1 of 3

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

BUREAU OF CLEAN WATER
MACROINVERTEBRATE SAMPLE SUMMARY
11/19/2021 1:37:53 PM

Ephemeroptera Richness	3				50.0	
Trichoptera Richness	1				9.1	
EPT Richness	7			45.8	41.2	87.5
Trichoptera Richness (PTV 0-4)	0			0.0		
EPT Richness (PTV 0-4)	4	21.1	25.0			
Becks Index (version 3)	1	2.6	4.5			
Becks Index (version 4)	7			35.2	31.8	58.3
FC + PR + SH Richness	6			51.7		
Hilsenhoff Biotic Index	6.03	49.0	57.1	58.9		64.4
% Sensitive Individuals (PTV 0-3)	4.10	4.9	6.1			
% Tolerant Individuals (PTV 7-10)	8.60					92.8
Shannon Diversity	1.27	44.4	44.4		52.3	59.6
	IBI SCORE	27.9	30.9	38.3	38.8	74.3

% Ephemeroptera	8.6	% Ephemeroptera (PTV 0-4)	0.5	% Dominant Taxon	69.5	BCG Richness Ratio	0.36
% Plecoptera	5.6	Ephemeroptera Richness (PTV 0-4)	1	% Chironomidae	69.5	BCG Individuals Ratio	0.06
% Trichoptera	1.0	Plecoptera Richness	3	% Simulidae	0.5		

IMPAIRMENT			
Not Impaired	Y	Insufficient Data	Y

HABITAT							
Instream Cover	13	Substrate / Cover		Frequency of Riffles	13	Bank Vegetation	15
Epifaunal Substrate	16	Velocity/Depth Regimes	16	Channel Flow Status	15	Disruptive Pressure	13
Embeddedness	16	Pool Variability		Channel Alteration	15	Riparian Zone	15
Pool Substrate		Sediment Deposition	13	Condition of Banks	11		
Pool-Glide Assessment? N		Instream Score = 58		Riparian Score = 41		Total Score = 171	

FIELD MEASUREMENTS					
Temperature (°C)	10.6	Dissolved Oxygen (mg/L)	10.83	Flow (CFS)	
pH	7.9	Total Alkalinity (mg/L as CaCO3)		Conductivity (uS/cm)	611

WATER CHEMISTRY			
Collector ID	0725	Sequence Number	300

SSRS_SLIMS_043 Ver 1.1

Page 2 of 3

Table 4. Bureau of Clean Water Macroinvertebrate Sample Summary for the location downstream of the Pigeon Creek STP Outfall.

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

BUREAU OF CLEAN WATER
MACROINVERTEBRATE SAMPLE SUMMARY
11/19/2021 1:28:59 PM

Export Taxa to Excel | Export Data to Excel

SAMPLE SUMMARY				
STATION ID: 20210506-0930-jadetweile	SECONDARY STATION ID:	LATITUDE: 40.13879580	LONGITUDE: -79.98751140	
STREAM NAME: Pigeon Creek (01183710)		HUC8 05020005 Lower Monongahela. Pennsylvania, West Virginia.		
SURVEY ID: 73048		METHOD: 6-Dframe Composite, 200 subsample		
SUBSAMPLED BY: Jamie Detweiler	IDENTIFIED BY: Jamie Detweiler	QUALITY ASSURED: N	QUALITY ASSURED BY:	PASSED QUALITY ASSURANCE: N
STATION LOCATION COMMENT: Downstream Pigeon Creek STP on both sides of Bentley Villa Rd				
BIOLOGY / HABITAT COMMENT: Algae. Very swift water. Some sites were bedrock				
LAND USE COMMENT:				
IMPAIRMENT COMMENT:				

TAXA

# grids from first pan = 4	# grids from second pan = 4	Subsample Size =	220

TAXA NAME	INDIVIDUALS	PTV	FFG	BCG COLD	BCG WARM
Baetis	2	6	CG	4	5
Caenis	1	7	CG	5	5
Hydroptila	2	6	SC	5	5
Psephenus	1	4	SC	4	4
Optioservus	1	4	SC	4	4
Stenelmis	11	5	SC	5	5
Probezzia	1	6	PR	4	4
Chironomidae	60	6	CG	5	5
Trepaxonemata	1	9	PR	5	5
Oligochaeta	140	10	CG	5	5

METRICS

		Freestone Riffle-Run 6D200				
METRIC NAME	RAW VALUE	2013 SMALL	2013 LARGE	2D100	MULTIHABITAT POOL GLIDE	LIMESTONE 2009
Total Richness	10	30.3	32.3		32.3	55.6
Ephemeroptera Richness	2				33.3	
Trichoptera Richness	1				9.1	
EPT Richness	3			19.6	17.6	37.5
Trichoptera Richness (PTV 0-4)	0			0.0		
EPT Richness (PTV 0-4)	0	0.0	0.0			

SSRS SLIMS 043 Ver 1.1

Page 1 of 3

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

BUREAU OF CLEAN WATER
MACROINVERTEBRATE SAMPLE SUMMARY
11/19/2021 1:28:59 PM

Becks Index (version 3)	0	0.0	0.0			
Becks Index (version 4)	2			10.1	9.1	16.7
FC + PR + SH Richness	2			17.2		
Hilsenhoff Biotic Index	8.50	16.5	21.6	22.3		24.4
% Sensitive Individuals (PTV 0-3)	0	0.0	0.0			
% Tolerant Individuals (PTV 7-10)	64.50					36.0
Shannon Diversity	1	35.0	35.0		41.2	46.9
	IBI SCORE	14.0	14.8	13.8	23.8	36.2

% Ephemeroptera	1.4	% Ephemeroptera (PTV 0-4)	0.0	% Dominant Taxon	63.6	BCG Richness Ratio	
% Plecoptera	0.0	Ephemeroptera Richness (PTV 0-4)	0	% Chironomidae	27.3	BCG Individuals Ratio	
% Trichoptera	0.9	Plecoptera Richness	0	% Simulidae	0.0		

IMPAIRMENT					
Not Impaired	Y	Insufficient Data	Y		

HABITAT							
Instream Cover	16	Substrate / Cover		Frequency of Riffles	20	Bank Vegetation	16
Epifaunal Substrate	20	Velocity/Depth Regimes	17	Channel Flow Status	17	Disruptive Pressure	10
Embeddedness	17	Pool Variability		Channel Alteration	14	Riparian Zone	11
Pool Substrate		Sediment Deposition	11	Condition of Banks	16		
Pool-Glide Assessment? N		Instream Score = 64		Riparian Score = 43		Total Score = 185	

FIELD MEASUREMENTS					
Temperature (°C)	10.6	Dissolved Oxygen (mg/L)	10.76	Flow (CFS)	
pH	7.78	Total Alkalinity (mg/L as CaCO3)		Conductivity (uS/cm)	616

WATER CHEMISTRY			
Collector ID	0725	Sequence Number	308

SSRS_SLIMS_043 Ver 1.1

Page 2 of 3

Whole Effluent Toxicity Summary

Instructions for Using PADEP WET Analysis Spreadsheet

This spreadsheet is designed to analyze Whole Effluent Toxicity (WET) test data using the statistical approach in EPA's "Test of Significant Toxicity" (TST) guidance document (EPA 833-R-10-003). Control replicate data are compared statistically with the target instream waste concentration (TIWC) replicate data. The intent is for permittees to provide an electronic or printed version of this spreadsheet with the NPDES permit renewal application that includes at least 16 endpoint results for chronic tests (4 tests, 4 endpoints each) or 8 endpoint results for acute tests (4 tests, 2 endpoints each) using the last four consecutive WET tests. The spreadsheet should also be used to determine whether an endpoint PASSES or FAILS specific tests during the permit term. Questions on the use of this form should be directed to DEP's Bureau of Clean Water at 717-787-5017.

Instructions:

Users can enter data into all cells with a green border, and can change the "TIWC" table header to a different value. Each worksheet is specific to one endpoint and can accommodate up to 4 test results for that endpoint. Four endpoint worksheets are provided ("Endpoint 1," "Endpoint 2," "Endpoint 3," and "Endpoint 4"). For chronic tests, all four worksheets should be used when reporting the last four consecutive test results for NPDES permit applications, and for acute tests, the first two worksheets should be used.

1. Enter the Facility Name and Permit No. for which the WET test(s) were completed.
2. Select, from the dropdown menus, the type of test (Chronic or Acute), the species tested (Ceriodaphnia dubia or Pimephales promelas), and the measured endpoint (survival, reproduction or growth). If you require a different option for a dropdown menu, contact DEP with your request.
3. Enter the Target Instream Waste Concentration (TIWC) value from the NPDES permit in decimal format. This is typically contained in the Part C condition for WET. The value of the TIWC itself is not critical for the TST calculations, but it is important that you enter the correct results associated with the TIWC dilution in the results table.
4. In the cell next to "No. per Replicate", enter the number of organisms used within each test condition replicate. Note that the numbers used in the results table cannot exceed this number for Survival endpoints.
5. Enter the Test Completion Date below the cell containing the same name.
6. Enter results for each replicate in the appropriate cells below the "Control" and "TIWC" table headers, corresponding to the number of organisms that survived at the end of the study, growth data, or reproduction data, corresponding to the endpoint selected above.

The mean, standard deviation and number of replicates are calculated below the results table. If there is no variability in both conditions, the T-test, degrees of freedom, and critical T-test results are not displayed, and the decision on whether a test passes or fails is based on the mean difference between the control and TIWC conditions (if less than the "b" value calculated above, the test passes, otherwise it fails). If there is variability in at least one condition, the T-test, degrees of freedom and critical T-test results are displayed, and the decision on whether a test passes or fails is based on a comparison of the T-test and critical T-test results (if the T-test result is greater than or equal to the critical T-test result, the test passes, otherwise it fails). In any case, if the mean result of the TIWC condition is greater than or equal to the mean result of the control condition, the test passes. Note that when the endpoint "Survival" is selected by the user, the results are transformed using an arcsine transformation in accordance with EPA's guidance, and the T-test, degrees of freedom, and critical T-test results are based on the arcsine transformed data.

In the event that a test condition that exceeds the TIWC condition would pass, the user may report that condition in lieu of the TIWC condition. If this is done, change the header above the results table accordingly. For example, if the TIWC value of 0.5 (50%) would fail, but a higher dilution of 0.75 (75%) would pass, change the table header from "TIWC" to "0.75".

The worksheet named "Evaluation" is generally used by DEP to evaluate Reasonable Potential and calculate WET limits, dilution series, and species as applicable for NPDES permits.

DEP Whole Effluent Toxicity (WET) Analysis Spreadsheet

Type of Test	Chronic
Species Tested	Ceriodaphnia
Endpoint	Reproduction
TIWC (decimal)	0.38
No. Per Replicate	1
TST b value	0.75
TST alpha value	0.2

Facility Name: Pigeon Creek Sanitary Authority

Permit No.: PA0044679

Test Completion Date: 7/10/2017

Replicate No.	Control	TIWC
1	5	22
2	25	25
3	11	26
4	22	27
5	22	27
6	24	26
7	23	28
8	26	28
9	25	25
10	23	26
11		
12		
13		
14		
15		
Mean	20.600	26.000
Std Dev.	6.915	1.764
# Replicates	10	10

T-Test Result	6.0899
Deg. of Freedom	15
Critical T Value	0.8662
Pass or Fail	PASS

Test Completion Date: 9/5/2017

Replicate No.	Control	TIWC
1	29	14
2	30	29
3	23	32
4	28	23
5	28	33
6	29	29
7	26	28
8	27	31
9	25	25
10	30	32
11		
12		
13		
14		
15		
Mean	27.500	27.600
Std Dev.	2.273	5.739
# Replicates	10	10

T-Test Result	3.6844
Deg. of Freedom	12
Critical T Value	0.8726
Pass or Fail	PASS

Test Completion Date: 10/3/2017

Replicate No.	Control	TIWC
1	28	27
2	27	21
3	30	29
4	31	28
5	28	32
6	30	30
7	15	30
8	28	30
9	24	26
10	31	29
11		
12		
13		
14		
15		
Mean	27.200	28.200
Std Dev.	4.780	3.048
# Replicates	10	10

T-Test Result	5.2422
Deg. of Freedom	17
Critical T Value	0.8633
Pass or Fail	PASS

Test Completion Date: 10/31/2017

Replicate No.	Control	TIWC
1	19	23
2	18	23
3	19	23
4	17	14
5	18	23
6	22	27
7	19	23
8	18	25
9	16	22
10	20	24
11		
12		
13		
14		
15		
Mean	18.600	22.700
Std Dev.	1.647	3.368
# Replicates	10	10

T-Test Result	7.7131
Deg. of Freedom	13
Critical T Value	0.8702
Pass or Fail	PASS

DEP Whole Effluent Toxicity (WET) Analysis Spreadsheet

Type of Test	Chronic
Species Tested	Ceriodaphnia
Endpoint	Survival
TIWC (decimal)	0.38
No. Per Replicate	1
TST b value	0.75
TST alpha value	0.2

Facility Name: Pigeon Creek Sanitary Authority

Permit No.: PA0044679

Test Completion Date: 7/10/2017

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

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

Test Completion Date: 9/5/2017

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: 10/3/2017

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: 10/31/2017

Replicate No.	Control	TIWC
1	1	1
2	1	1
3	1	1
4	1	0
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	0.900
Std Dev.	0.000	0.316
# 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	Pimephales
Endpoint	Survival
TIWC (decimal)	0.38
No. Per Replicate	10
TST b value	0.75
TST alpha value	0.25

Facility Name: Pigeon Creek Sanitary Authority

Permit No.: PA0044679

Test Completion Date: 7/11/2017

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

T-Test Result	14.8898
Deg. of Freedom	5
Critical T Value	0.7267
Pass or Fail	PASS

Test Completion Date: 9/5/2017

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

T-Test Result	13.2898
Deg. of Freedom	5
Critical T Value	0.7267
Pass or Fail	PASS

Test Completion Date: 10/3/2017

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

T-Test Result	14.8898
Deg. of Freedom	5
Critical T Value	0.7267
Pass or Fail	PASS

Test Completion Date: 10/31/2017

Replicate No.	Control	TIWC
1	0.9	0.9
2	1	1
3	1	1
4	1	0.9
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
Mean	0.975	0.950
Std Dev.	0.050	0.058
# Replicates	4	4

T-Test Result	12.7913
Deg. of Freedom	5
Critical T Value	0.7267
Pass or Fail	PASS

DEP Whole Effluent Toxicity (WET) Analysis Spreadsheet

Type of Test	Chronic
Species Tested	Pimephales
Endpoint	Growth
TIWC (decimal)	0.38
No. Per Replicate	10
TST b value	0.75
TST alpha value	0.25

Facility Name: Pigeon Creek Sanitary Authority

Permit No.: PA0044679

Test Completion Date: 7/11/2017

Replicate No.	Control	TIWC
1	0.235	0.31
2	0.273	0.346
3	0.353	0.39
4	0.352	0.385
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
Mean	0.303	0.358
Std Dev.	0.059	0.037
# Replicates	4	4

T-Test Result	4.4996
Deg. of Freedom	5
Critical T Value	0.7267
Pass or Fail	PASS

Test Completion Date: 9/5/2017

Replicate No.	Control	TIWC
1	0.409	0.479
2	0.405	0.48
3	0.384	0.382
4	0.448	0.482
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
Mean	0.412	0.451
Std Dev.	0.027	0.059
# Replicates	4	4

T-Test Result	4.5499
Deg. of Freedom	4
Critical T Value	0.7407
Pass or Fail	PASS

Test Completion Date: 10/3/2017

Replicate No.	Control	TIWC
1	0.467	0.49
2	0.434	0.516
3	0.444	0.482
4	0.444	0.494
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
Mean	0.447	0.496
Std Dev.	0.014	0.015
# Replicates	4	4

T-Test Result	17.8487
Deg. of Freedom	5
Critical T Value	0.7267
Pass or Fail	PASS

Test Completion Date: 10/31/2017

Replicate No.	Control	TIWC
1	0.346	0.448
2	0.48	0.426
3	0.463	0.478
4	0.488	0.466
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
Mean	0.444	0.455
Std Dev.	0.066	0.023
# Replicates	4	4

T-Test Result	4.4390
Deg. of Freedom	5
Critical T Value	0.7267
Pass or Fail	PASS

WET Summary and Evaluation

Facility Name	Pigeon Creek Sanitary Authority
Permit No.	PA0044679
Design Flow (MGD)	1.02
Q_{7-10} Flow (cfs)	1.29
PMF_a	1
PMF_c	1

		Test Results (Pass/Fail)			
		Test Date	Test Date	Test Date	Test Date
Species	**Endpoint**	7/10/17		10/3/17	10/31/17
Ceriodaphnia	Reproduction	PASS	PASS	PASS	PASS

		Test Results (Pass/Fail)			
		Test Date	Test Date	Test Date	Test Date
Species	**Endpoint**	7/10/17	9/5/17	10/3/17	10/31/17
Ceriodaphnia	Survival	PASS	PASS	PASS	PASS

		Test Results (Pass/Fail)			
		Test Date	Test Date	Test Date	Test Date
Species	**Endpoint**	7/11/17	9/5/17	10/3/17	10/31/17
Pimephales	Survival	PASS	PASS	PASS	PASS

		Test Results (Pass/Fail)			
		Test Date	Test Date	Test Date	Test Date
Species	**Endpoint**	7/11/17		10/3/17	10/31/17
Pimephales	Growth	PASS	PASS	PASS	PASS

Reasonable Potential? NO

Permit Recommendations

Test Type	**Chronic**
TIWC	**55** % Effluent
Dilution Series	**14, 28, 55, 78, 100** % Effluent
Permit Limit	**None**
Permit Limit Species	