

Application Type

Renewal

Facility Type

Municipal

Major / Minor

Major

**NPDES PERMIT FACT SHEET
INDIVIDUAL SEWAGE**

Application No.

PA0026417

APS ID

1064665

Authorization ID

1398406

Applicant and Facility Information

Applicant Name	<u>Penn Hills Municipality</u>	Facility Name	<u>Plum Creek STP</u>
Applicant Address	<u>12245 Frankstown Road</u>	Facility Address	<u>91 Colorado Street</u>
	<u>Pgh, PA 15235-3494</u>		<u>Verona, PA 15147-2219</u>
Applicant Contact	<u>Jennifer Cohn</u>	Facility Contact	
Applicant Phone	<u>(412) 798-2171</u>	Facility Phone	
Client ID	<u>77993</u>	Site ID	<u>256014</u>
Ch 94 Load Status	<u>Not Overloaded</u>	Municipality	<u>Penn Hills Township</u>
Connection Status	<u>No Limitations</u>	County	<u>Allegheny</u>
Date Application Received	<u>June 2, 2022</u>	EPA Waived?	<u>No</u>
Date Application Accepted	<u>June 3, 2022</u>	If No, Reason	<u>Major Facility</u>
Purpose of Application	<u>Renewal application to discharge treated sewage</u>		

Summary of Review

This review is in response to a renewal application received on June 2, 2022. Penn Hills owns and operates the Plum Creek Sewage Treatment Plant in Penn Hills, Allegheny County. Domestic sewage from parts of Penn Hills and Plum Borough is collected and treated with the following unit operations: screening, grit removal, primary settling, step feed aeration, final settling, and UV disinfection. The treated effluent from the UV disinfection system travels approximately 1.75 miles through a dedicated outfall pipe to the Allegheny River through outfall 001.

Waste activated sludge and primary clarifier sludge are anaerobically digested. Sludge is ultimately disposed at the Westmoreland Sanitary Landfill.

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 Vanek James Vanek, P.E. / Environmental Engineer	July 8, 2024
X		Mahbuba Iasmin Mahbuba Iasmin, Ph.D., P.E. / Environmental Engineering Manager	July 15, 2024

Discharge, Receiving Waters and Water Supply Information

Outfall No.	001	Design Flow (MGD)	3.9
Latitude	40° 30' 31.75"	Longitude	-79° 49' 21.37"
Quad Name		Quad Code	
Wastewater Description:	Sewage Effluent		
Receiving Waters	Allegheny River	Stream Code	42122
NHD Com ID		RMI	11.36
Drainage Area	11610	Yield (cfs/mi ²)	0.25
Q ₇₋₁₀ Flow (cfs)	2900	Q ₇₋₁₀ Basis	USACE
Elevation (ft)	720	Slope (ft/ft)	0.001
Watershed No.	18-A	Chapter 93 Class.	WWF
Existing Use		Existing Use Qualifier	
Exceptions to Use	none	Exceptions to Criteria	none
Assessment Status	Impaired		
Cause(s) of Impairment	Chlordane, PCB		
Source(s) of Impairment			
TMDL Status	Final	Name	Allegheny River
Background/Ambient Data		Data Source	
pH (SU)			
Temperature (°F)			
Hardness (mg/L)			
Other:			
Nearest Downstream Public Water Supply Intake		PWSA Aspinwall Waterworks	
PWS Waters	Allegheny River	Flow at Intake (cfs)	2900
PWS RMI	8.6	Distance from Outfall (mi)	2.76

Changes Since Last Permit Issuance:

Other Comments:

Treatment Facility Summary				
Treatment Facility Name: Plum Creek STP				
WQM Permit No.		Issuance Date		
0288436		6/30/2022		
0288436		2/13/2009		
0288436		3/3/2006		
0288436		7/24/2001		
Waste Type	Degree of Treatment	Process Type	Disinfection	Avg Annual Flow (MGD)
Sewage	Tertiary	Step Aeration	UV disinfection	2.66
Hydraulic Capacity (MGD)	Organic Capacity (lbs/day)	Load Status	Biosolids Treatment	Biosolids Use/Disposal
3.9	6290	Not Overloaded	Anaerobic digestion	Landfill

Changes Since Last Permit Issuance:

Other Comments:

Compliance History

DMR Data for Outfall 001 (from June 1, 2023 to May 31, 2024)

Parameter	MAY-24	APR-24	MAR-24	FEB-24	JAN-24	DEC-23	NOV-23	OCT-23	SEP-23	AUG-23	JUL-23	JUN-23
Flow (MGD) Average Monthly	2.82	5.23	3.34	2.57	3.74	1.97	2.00	1.89	1.81	2.88	2.59	1.88
Flow (MGD) Daily Maximum	6.87	9.64	6.42	5.26	8.22	4.98	2.17	3.18	2.13	5.56	5.69	2.87
pH (S.U.) Minimum	6.9	6.8	6.9	6.9	6.7	6.9	6.6	7.2	6.6	6.6	6.79	6.3
pH (S.U.) Maximum	7.2	7.4	7.2	7.4	7.4	7.3	7.3	7.6	7.50	7.1	8.53	7.7
DO (mg/L) Minimum	6.4	6.42	7.0	6.7	7.1	7.0	6.6	6.1	6.1	6.2	6.3	6.1
CBOD5 (lbs/day) Average Monthly	80.4	298.8	106.9	117.9	225.4	82.5	55.4	67.5	70.9	110.1	89.9	106.0
CBOD5 (lbs/day) Weekly Average	101.5	555.8	151.4	273.6	429.7	155.8	71.3	108.8	106.5	220.5	125.0	186.7
CBOD5 (mg/L) Average Monthly	3.4	5.8	3.9	5.5	6.4	4.7	3.3	4.3	4.6	4.2	4.3	6.8
CBOD5 (mg/L) Weekly Average	3.8	8.6	5.5	8.7	9.7	6.9	4.0	6.3	6.6	7.0	7.8	10.1
BOD5 (lbs/day) Raw Sewage Influent Average Monthly	1736	2713	2144	2356	1917	2026	1729	1565	1379	1571	1563	1423
BOD5 (lbs/day) Raw Sewage Influent Daily Maximum	5165	21630	6651	7767	5675	4653	3177	3286	2571	8444	3894	2797
BOD5 (mg/L) Raw Sewage Influent Average Monthly	75.8	68	83	108.6	69.0	125.9	104.7	103.5	91.7	72.2	77.9	92.6
TSS (lbs/day) Average Monthly	94.9	746.4	234.1	243.0	199.4	71.9	70.2	76.4	79.7	85.8	89.0	303.9
TSS (lbs/day) Raw Sewage Influent Average Monthly	2211	3033	2497	3067	2542	2709	2893	2063	1597	1941	1925	1324

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TSS (lbs/day) Raw Sewage Influent Daily Maximum	7766	9830	11004	14656	13308	6481	35009	5180	3872	7258	10116	756.9
TSS (lbs/day) Weekly Average	124.0	2224.5	451.0	1006.4	546.6	104.1	85.7	134.3	128.6	114.8	120.7	756.9
TSS (mg/L) Average Monthly	4.0	12.0	7.0	11.0	5.0	4.0	4.0	5.0	5.0	3.0	4.0	18.0
TSS (mg/L) Raw Sewage Influent Average Monthly	100	85	100	136	88.0	167	180	133	105	80	81	84
TSS (mg/L) Weekly Average	5.0	28.0	13.0	32.0	11.0	8.0	5.0	9.0	9.0	4.0	6.0	36.0
Fecal Coliform (No./100 ml) Geometric Mean	10.0	< 112	9	14	13	5	7	18	9	10	11	4
Fecal Coliform (No./100 ml) Instantaneous Maximum	225.0	2420	73	2420	2420	2420	2420	2420	72	173	2420	2420
UV Transmittance (%) Minimum	29.70	1.2	73.9	28.40	64	60.20	49.60	53.70	62.30	50.50	38.80	26.20
Total Nitrogen (mg/L) Daily Maximum			17.40			11.2			25.40			5.79
Ammonia (lbs/day) Average Monthly	274	335	331	446	401	297	264	210	113.0	70	165.0	485.65
Ammonia (mg/L) Average Monthly	12.22	10.56	12.92	21.47	14.99	17.82	15.77	13.56	7.58	3.91	9.90	25.10
Total Phosphorus (mg/L) Daily Maximum			0.43			1.18			2.49			0.46

Operations Compliance Check Summary Report

Facility: Plum Creek STP

NPDES Permit No.: PA0026417

Compliance Review Period: 7/2019 – 7/2024

Inspection Summary:

INSP ID	INSPECTED DATE	INSP TYPE	AGENCY	INSPECTION RESULT DESC
3763885	04/23/2024	Compliance Evaluation	County Health Dept	Violation(s) Noted
3585056	05/02/2023	Compliance Evaluation	County Health Dept	Violation(s) Noted
3352632	04/14/2022	Compliance Evaluation	County Health Dept	Violation(s) Noted
3179862	04/14/2021	Compliance Evaluation	County Health Dept	Violation(s) Noted
3097229	07/29/2020	Compliance Evaluation	County Health Dept	Violation(s) Noted
3077138	07/29/2020	Compliance Evaluation	PA Dept of Environmental Protection	Violation(s) Noted
2937871	09/12/2019	Compliance Evaluation	County Health Dept	Violation(s) Noted

Violation Summary:

VIOL ID	VIOLATION DATE	VIOLATION TYPE DESC	RESOLVED DATE	INSP ID	INSPECTED DATE	INSP TYPE
8187566	04/23/2024	NPDES - Violation of effluent limits in Part A of permit		3763885	04/23/2024	Compliance Evaluation
8187567	04/23/2024	NPDES - Failure to properly document monitoring activities and results		3763885	04/23/2024	Compliance Evaluation

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8187568	04/23/2024	NPDES - Illegal discharge to waters of the Commonwealth from a sanitary sewer overflow (SSO)		3763885	04/23/2024	Compliance Evaluation
8152119	05/02/2023	NPDES - Violation of effluent limits in Part A of permit	10/31/2023	3585056	05/02/2023	Compliance Evaluation
8152120	05/02/2023	NPDES - Violation of effluent limits in Part A of permit	10/31/2023	3585056	05/02/2023	Compliance Evaluation
952723	04/14/2022	NPDES - Violation of effluent limits in Part A of permit	04/14/2022	3352632	04/14/2022	Compliance Evaluation
952724	04/14/2022	NPDES - Violation of Part C permit condition(s)	04/14/2022	3352632	04/14/2022	Compliance Evaluation
914414	04/14/2021	NPDES - Failure to collect representative samples	10/29/2021	3179862	04/14/2021	Compliance Evaluation
914415	04/14/2021	NPDES - Violation of effluent limits in Part A of permit	10/29/2021	3179862	04/14/2021	Compliance Evaluation
893541	07/29/2020	NPDES - Violation of effluent limits in Part A of permit	09/08/2020	3077138	07/29/2020	Compliance Evaluation
893542	07/29/2020	NPDES - Unauthorized bypass occurred	09/08/2020	3077138	07/29/2020	Compliance Evaluation
897708	07/29/2020	NPDES - Violation of effluent limits in Part A of permit	10/22/2020	3097229	07/29/2020	Compliance Evaluation

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897709	07/29/2020	CSL - Unauthorized, unpermitted discharge of sewage to waters of the Commonwealth	10/22/2020	3097229	07/29/2020	Compliance Evaluation
863407	09/12/2019	NPDES - Violation of effluent limits in Part A of permit	10/22/2020	2937871	09/12/2019	Compliance Evaluation
863413	09/12/2019	CSL - Unauthorized, unpermitted discharge of sewage to waters of the Commonwealth	10/22/2020	2937871	09/12/2019	Compliance Evaluation

Open Violations by Client ID:

CLIENT ID	INSP ID	VIOLATION ID	VIOLATION DATE	VIOLATION	
77993	3763885	8187566	04/23/2024	NPDES - Violation of effluent limits in Part A of permit	
77993	3763885	8187567	04/23/2024	NPDES - Failure to properly document monitoring activities and results	
77993	3763885	8187568	04/23/2024	NPDES - Illegal discharge to waters of the Commonwealth from a sanitary sewer overflow (SSO)	

Enforcement Summary:

ENF ID	ENF TYPE	EXECUTED DATE	ENF FINAL STATUS		ENF CLOSED DATE
429213	NOV	05/17/2024			
417716	NOV	07/14/2023			
403112	NOV	04/26/2022	Comply/Closed	04/28/2022	
393794	NOV	04/21/2021	Administrative Close Out	01/02/2024	

DMR Violation Summary:

START	END	NON COMPLIANCE CATEGORY	PARAMETER	SAMPLE	PERMIT	UNIT OF MEASURE	STATISTICAL BASE CODE
04/01/2024	04/30/2024	Load 2 Effluent Violation	Total Suspended Solids	2224.5	1464.5	lbs/day	Weekly Average
07/01/2023	07/31/2023	Concentration 3 Effluent Violation	Fecal Coliform	2420	1000	No./100 ml	Instantaneous Maximum
06/01/2023	06/30/2023	Concentration 3 Effluent Violation	Fecal Coliform	2420	1000	No./100 ml	Instantaneous Maximum
05/01/2023	05/31/2023	Concentration 3 Effluent Violation	Fecal Coliform	2420	1000	No./100 ml	Instantaneous Maximum
08/01/2022	08/31/2022	Concentration 3 Effluent Violation	Fecal Coliform	> 2420	1000	No./100 ml	Instantaneous Maximum
07/01/2022	07/31/2022	Concentration 3 Effluent Violation	Fecal Coliform	2420	1000	No./100 ml	Instantaneous Maximum
05/01/2022	05/31/2022	Concentration 3 Effluent Violation	Fecal Coliform	2420	1000	No./100 ml	Instantaneous Maximum
05/01/2022	05/31/2022	Load 2 Effluent Violation	Total Suspended Solids	1533.5	1464.5	lbs/day	Weekly Average
08/01/2021	08/31/2021	Concentration 3 Effluent Violation	Fecal Coliform	2420	1000	No./100 ml	Instantaneous Maximum
07/01/2021	07/31/2021	Concentration 3 Effluent Violation	Fecal Coliform	2420	1000	No./100 ml	Instantaneous Maximum
06/01/2021	06/30/2021	Concentration 1 Effluent Violation	Dissolved Oxygen	3.5	4.0	mg/L	Minimum
06/01/2021	06/30/2021	Concentration 2 Effluent Violation	Fecal Coliform	406	200	No./100 ml	Geometric Mean
06/01/2021	06/30/2021	Concentration 3 Effluent Violation	Fecal Coliform	61310	1000	No./100 ml	Instantaneous Maximum
05/01/2021	05/31/2021	Concentration 3 Effluent Violation	Fecal Coliform	2420	1000	No./100 ml	Instantaneous Maximum
02/01/2021	02/28/2021	Concentration 3 Effluent Violation	Total Suspended Solids	75.0	45.0	mg/L	Weekly Average
02/01/2021	02/28/2021	Concentration 3 Effluent Violation	pH	9.3	9.0	S.U.	Maximum

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02/01/2021	02/28/2021	Load 2 Effluent Violation	Total Suspended Solids	2287.4	1464.5	lbs/day	Weekly Average
06/01/2020	06/30/2020	Concentration 3 Effluent Violation	Fecal Coliform	> 2420	1000	No./100 ml	Instantaneous Maximum
02/01/2020	02/29/2020	Concentration 3 Effluent Violation	Fecal Coliform	13960	10000	No./100 ml	Instantaneous Maximum
07/01/2019	07/31/2019	Concentration 3 Effluent Violation	Fecal Coliform	2420	1000	No./100 ml	Instantaneous Maximum

Compliance Status: Open violations will need resolved prior to permit issuance.

Completed by: John Murphy

Completed date: 7/9/2024

Development of Effluent Limitations

Outfall No. 001
Latitude 40° 8' 20.00"
Wastewater Description: Sewage Effluent

Design Flow (MGD) 3.9
Longitude -79° 59' 19.00"

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 and Total Phosphorus 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. 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.

Plum 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 CBOD₅ 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	813.6	1220.5
Total Suspended Solids	976.4	1464.5

Water Quality-Based Limitations

Water quality analysis was performed using the Toxics Management Spreadsheet (TMS) and WQM7.0. The model runs are included in the references section of the report. The results showed that water quality based effluent limits for this discharge are not necessary.

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 ("CBOD₅"), 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 CBOD₅ 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 3: 001 WQM 7.0 Summer Inputs

Discharge Characteristics	
Parameter	Value
River Mile Index	11.36
Discharge Flow (MGD)	3.9
Discharge Temp. (°C) (Summer)	20.0
Basin/Stream Characteristics	
Parameter	Value
Area in Square Miles	11610
Q ₇₋₁₀ (cfs)	2900
Low-flow yield (cfs/mi ²)	0.25
Elevation (ft)	780
Slope	0.001
Stream Temp. (°C) (Summer)	20.0
Reach Width (ft)	1500
Reach Depth (ft)	12
Stream pH (s.u.)	7.0

The WQM 7.0 model is run for Outfall 001 to determine whether WQBELs are necessary for CBOD₅, ammonia-nitrogen, and/or dissolved oxygen. Input values for the WQM 7.0 model are shown in Table 3.

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 20°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 3.9 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 3.0 mg/L. The background dissolved oxygen concentration of the Allegheny River at 20°C is assumed to be 7.78 mg/L. The width and depth of the stream have been estimated and placed in the model. The US Army Corps of Engineers minimum flow in the Allegheny River at the discharge point is the Q₇₋₁₀ which is 2900 cfs.

Since the results for the warmer months did not result in seasonal limits for CBOD₅ nor water quality-based limits for NH₃N, a winter evaluation was not performed.

CBOD₅ Discussion

The IMAX concentration limits for CBOD₅ will appear in the permit, but since 24-hour composite sampling is required and IMAX limits only apply when grab sampling is specified, Plum Creek STP 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.

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 Q₇₋₁₀ flow of the receiving stream.

The modeling results show that water quality based effluent limits are not necessary for Plum Creek STP.

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 BOD₅ and TSS including average monthly and average weekly influent loading and average monthly and average weekly influent concentrations.

The organic design capacity of 6290 lbs BOD₅ 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, BOD₅ is the parameter used to determine whether a sewage treatment plant is organically overloaded.

Industrial Contributors

The application does not list any industrial contributors to the collection system.

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 Sewage Permits" [SOP No. BCW-PMT-031] 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-031 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.

Whole Effluent Toxicity (WET)

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

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

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: 2.

WET spreadsheet evaluation is included in the references section of this report.

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

Acute Partial Mix Factor (PMFa): **0.08**

Chronic Partial Mix Factor (PMFc): **0.55**

1. Determine IWC – Acute (IWCa):

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

$[(3.9 \text{ MGD} \times 1.547) / ((2900 \text{ cfs} \times 0.08) + (3.9 \text{ MGD} \times 1.547))] \times 100 = 2.53\%$

Is IWCa < 1%? YES NO

Type of Test for Permit Renewal: Chronic

2. Determine Target IWCr

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

$[(3.9 \text{ MGD} \times 1.547) / ((2900 \text{ cfs} \times 0.55) + (3.9 \text{ MGD} \times 1.547))] \times 100 = 0.38\%$

3. Determine Dilution Series

Dilution Series = 100%, 60%, 30%, 2%, and 1%.

WET Limits

Has reasonable potential been determined? YES NO

Will WET limits be established in the permit? YES NO

Proposed Effluent Limitations and Monitoring Requirements

The limitations and monitoring requirements specified below are proposed for the draft permit, and reflect the most stringent limitations amongst technology, water quality and BPJ. Instantaneous Maximum (IMAX) limits are determined using multipliers of 2 (conventional pollutants) or 2.5 (toxic pollutants). Sample frequencies and types are derived from the "NPDES Permit Writer's Manual" (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	Instantaneous Minimum	Average Monthly	Weekly Average	Instant. Maximum		
Flow (MGD)	Report	Report Daily Max	XXX	XXX	XXX	XXX	Continuous	Recorded
pH (S.U.)	XXX	XXX	6.0	XXX	XXX	9.0	1/day	Grab
DO	XXX	XXX	4.0	XXX	XXX	XXX	1/day	Grab
CBOD5	813.6	1220.5	XXX	25.0	37.5	50	1/day	24-Hr Composite
BOD5 Raw Sewage Influent	Report	Report Daily Max	XXX	Report	XXX	XXX	1/day	24-Hr Composite
TSS	976.4	1464.5	XXX	30.0	45.0	60	1/day	24-Hr Composite
TSS Raw Sewage Influent	Report	Report Daily Max	XXX	Report	XXX	XXX	1/day	24-Hr Composite
Fecal Coliform (No./100 ml) Oct 1 - Apr 30	XXX	XXX	XXX	2000 Geo Mean	XXX	10000	1/day	Grab
Fecal Coliform (No./100 ml) May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	XXX	1000	1/day	Grab
E. Coli (No./100 ml)	XXX	XXX	XXX	XXX	XXX	Report	1/month	Grab
UV Transmittance (%)	XXX	XXX	Report	XXX	XXX	XXX	1/day	Measured
Total Nitrogen	XXX	XXX	XXX	Report Daily Max	XXX	XXX	1/quarter	24-Hr Composite

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

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) ⁽¹⁾		Concentrations (mg/L)				Minimum ⁽²⁾ Measurement Frequency	Required Sample Type
	Average Monthly	Weekly Average	Instantaneous Minimum	Average Monthly	Weekly Average	Instant. Maximum		
Ammonia Nitrogen	Report	XXX	XXX	Report	XXX	XXX	1/day	24-Hr Composite
Total Phosphorus	XXX	XXX	XXX	Report Daily Max	XXX	XXX	1/quarter	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: at outfall 001

Other Comments: This sewage plant discharges directly to the Allegheny River

References

TMS Printout

Model Results

Plum Creek STP, NPDES Permit No. PA0026417, Outfall 001

Instructions	Results	RETURN TO INPUTS	SAVE AS PDF	PRINT	<input checked="" type="radio"/> All	<input type="radio"/> Inputs	<input type="radio"/> Results	<input type="radio"/> Limits
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Hydrodynamics

Wasteload Allocations

AFC

CCT (min):

PMF:

Analysis Hardness (mg/l):

Analysis pH:

Pollutants	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Total Dissolved Solids (PWS)	0	0		0	N/A	N/A	N/A	
Chloride (PWS)	0	0		0	N/A	N/A	N/A	
Sulfate (PWS)	0	0		0	N/A	N/A	N/A	
Total Aluminum	0	0		0	750	750	29,661	
Total Antimony	0	0		0	1,100	1,100	43,502	
Total Arsenic	0	0		0	340	340	13,446	Chem Translator of 1 applied
Total Barium	0	0		0	21,000	21,000	830,496	
Total Boron	0	0		0	8,100	8,100	320,334	
Total Cadmium	0	0		0	2.026	2.15	84.9	Chem Translator of 0.944 applied
Total Chromium (III)	0	0		0	572.594	1,812	71,660	Chem Translator of 0.316 applied
Hexavalent Chromium	0	0		0	16	16.3	644	Chem Translator of 0.982 applied
Total Cobalt	0	0		0	95	95.0	3,757	
Total Copper	0	0		0	13.516	14.1	557	Chem Translator of 0.96 applied
Free Cyanide	0	0		0	22	22.0	870	
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	65.008	82.3	3,254	Chem Translator of 0.79 applied
Total Manganese	0	0		0	N/A	N/A	N/A	
Total Mercury	0	0		0	1.400	1.65	65.1	Chem Translator of 0.85 applied
Total Nickel	0	0		0	470.639	472	18,650	Chem Translator of 0.998 applied
Total Phenols (Phenolics) (PWS)	0	0		0	N/A	N/A	N/A	
Total Selenium	0	0		0	N/A	N/A	N/A	Chem Translator of 0.922 applied
Total Silver	0	0		0	3.250	3.82	151	Chem Translator of 0.85 applied
Total Thallium	0	0		0	65	65.0	2,571	
Total Zinc	0	0		0	117.783	120	4,763	Chem Translator of 0.978 applied
Acrolein	0	0		0	3	3.0	119	
Acrylamide	0	0		0	N/A	N/A	N/A	

Model Results

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Acrylonitrile	0	0		0	650	650	25,706	
Benzene	0	0		0	640	640	25,310	
Bromoform	0	0		0	1,800	1,800	71,185	
Carbon Tetrachloride	0	0		0	2,800	2,800	110,733	
Chlorobenzene	0	0		0	1,200	1,200	47,457	
Chlorodibromomethane	0	0		0	N/A	N/A	N/A	
2-Chloroethyl Vinyl Ether	0	0		0	18,000	18,000	711,854	
Chloroform	0	0		0	1,900	1,900	75,140	
Dichlorobromomethane	0	0		0	N/A	N/A	N/A	
1,2-Dichloroethane	0	0		0	15,000	15,000	593,212	
1,1-Dichloroethylene	0	0		0	7,500	7,500	296,606	
1,2-Dichloropropane	0	0		0	11,000	11,000	435,022	
1,3-Dichloropropylene	0	0		0	310	310	12,260	
Ethylbenzene	0	0		0	2,900	2,900	114,688	
Methyl Bromide	0	0		0	550	550	21,751	
Methyl Chloride	0	0		0	28,000	28,000	1,107,329	
Methylene Chloride	0	0		0	12,000	12,000	474,569	
1,1,2,2-Tetrachloroethane	0	0		0	1,000	1,000	39,547	
Tetrachloroethylene	0	0		0	700	700	27,683	
Toluene	0	0		0	1,700	1,700	67,231	
1,2-trans-Dichloroethylene	0	0		0	6,800	6,800	268,923	
1,1,1-Trichloroethane	0	0		0	3,000	3,000	118,642	
1,1,2-Trichloroethane	0	0		0	3,400	3,400	134,461	
Trichloroethylene	0	0		0	2,300	2,300	90,959	
Vinyl Chloride	0	0		0	N/A	N/A	N/A	
2-Chlorophenol	0	0		0	560	560	22,147	
2,4-Dichlorophenol	0	0		0	1,700	1,700	67,231	
2,4-Dimethylphenol	0	0		0	660	660	26,101	
4,6-Dinitro-o-Cresol	0	0		0	80	80.0	3,164	
2,4-Dinitrophenol	0	0		0	660	660	26,101	
2-Nitrophenol	0	0		0	8,000	8,000	316,380	
4-Nitrophenol	0	0		0	2,300	2,300	90,959	
p-Chloro-m-Cresol	0	0		0	160	160	6,328	
Pentachlorophenol	0	0		0	8.723	8.72	345	
Phenol	0	0		0	N/A	N/A	N/A	
2,4,6-Trichlorophenol	0	0		0	460	460	18,192	
Acenaphthene	0	0		0	83	83.0	3,282	
Anthracene	0	0		0	N/A	N/A	N/A	
Benzidine	0	0		0	300	300	11,864	
Benzo(a)Anthracene	0	0		0	0.5	0.5	19.8	
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	1,186,423	
Bis(2-Chloroisopropyl)Ether	0	0		0	N/A	N/A	N/A	
Bis(2-Ethylhexyl)Phthalate	0	0		0	4,500	4,500	177,964	
4-Bromophenyl Phenyl Ether	0	0		0	270	270	10,678	
Butyl Benzyl Phthalate	0	0		0	140	140	5,537	

2-Chloronaphthalene	0	0		0	N/A	N/A	N/A	
Chrysene	0	0		0	N/A	N/A	N/A	
Dibenzo(a,h)Anthracene	0	0		0	N/A	N/A	N/A	
1,2-Dichlorobenzene	0	0		0	820	820	32,429	
1,3-Dichlorobenzene	0	0		0	350	350	13,842	
1,4-Dichlorobenzene	0	0		0	730	730	28,870	
3,3-Dichlorobenzidine	0	0		0	N/A	N/A	N/A	
Diethyl Phthalate	0	0		0	4,000	4,000	158,190	
Dimethyl Phthalate	0	0		0	2,500	2,500	98,869	
Di-n-Butyl Phthalate	0	0		0	110	110	4,350	
2,4-Dinitrotoluene	0	0		0	1,600	1,600	63,276	
2,6-Dinitrotoluene	0	0		0	990	990	39,152	
1,2-Diphenylhydrazine	0	0		0	15	15.0	593	
Fluoranthene	0	0		0	200	200	7,909	
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	395	
Hexachlorocyclopentadiene	0	0		0	5	5.0	198	
Hexachloroethane	0	0		0	60	60.0	2,373	
Indeno(1,2,3-cd)Pyrene	0	0		0	N/A	N/A	N/A	
Isophorone	0	0		0	10,000	10,000	395,474	
Naphthalene	0	0		0	140	140	5,537	
Nitrobenzene	0	0		0	4,000	4,000	158,190	
n-Nitrosodimethylamine	0	0		0	17,000	17,000	672,307	
n-Nitrosodi-n-Propylamine	0	0		0	N/A	N/A	N/A	
n-Nitrosodiphenylamine	0	0		0	300	300	11,864	
Phenanthrene	0	0		0	5	5.0	198	
Pyrene	0	0		0	N/A	N/A	N/A	
1,2,4-Trichlorobenzene	0	0		0	130	130	5,141	
Aldrin	0	0		0	3	3.0	119	
alpha-BHC	0	0		0	N/A	N/A	N/A	
beta-BHC	0	0		0	N/A	N/A	N/A	
gamma-BHC	0	0		0	0.95	0.95	37.6	
Chlordane	0	0		0	2.4	2.4	94.9	
4,4-DDT	0	0		0	1.1	1.1	43.5	
4,4-DDE	0	0		0	1.1	1.1	43.5	
4,4-DDD	0	0		0	1.1	1.1	43.5	
Dieldrin	0	0		0	0.24	0.24	9.49	
alpha-Endosulfan	0	0		0	0.22	0.22	8.7	
beta-Endosulfan	0	0		0	0.22	0.22	8.7	
Endosulfan Sulfate	0	0		0	N/A	N/A	N/A	
Endrin	0	0		0	0.086	0.086	3.4	
Endrin Aldehyde	0	0		0	N/A	N/A	N/A	
Heptachlor	0	0		0	0.52	0.52	20.6	
Heptachlor Epoxide	0	0		0	0.5	0.5	19.8	
Toxaphene	0	0		0	0.73	0.73	28.9	

CFC

CCT (min): 720

PMF: 0.555

Analysis Hardness (mg/l): 100.09

Analysis pH: 7.00

Model Results

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Pollutants	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Total Dissolved Solids (PWS)	0	0		0	N/A	N/A	N/A	
Chloride (PWS)	0	0		0	N/A	N/A	N/A	
Sulfate (PWS)	0	0		0	N/A	N/A	N/A	
Total Aluminum	0	0		0	N/A	N/A	N/A	
Total Antimony	0	0		0	220	220	58,974	
Total Arsenic	0	0		0	150	150	40,210	Chem Translator of 1 applied
Total Barium	0	0		0	4,100	4,100	1,099,065	
Total Boron	0	0		0	1,600	1,600	428,903	
Total Cadmium	0	0		0	0.246	0.27	72.6	Chem Translator of 0.909 applied
Total Chromium (III)	0	0		0	74.169	86.2	23,119	Chem Translator of 0.86 applied
Hexavalent Chromium	0	0		0	10	10.4	2,787	Chem Translator of 0.962 applied
Total Cobalt	0	0		0	19	19.0	5,093	
Total Copper	0	0		0	8.963	9.34	2,503	Chem Translator of 0.96 applied
Free Cyanide	0	0		0	5.2	5.2	1,394	
Dissolved Iron	0	0		0	N/A	N/A	N/A	
Total Iron	0	0		0	1,500	1,500	723,120	WQC = 30 day average; PMF = 1
Total Lead	0	0		0	2,519	3.19	854	Chem Translator of 0.791 applied
Total Manganese	0	0		0	N/A	N/A	N/A	
Total Mercury	0	0		0	0.770	0.91	243	Chem Translator of 0.85 applied
Total Nickel	0	0		0	52.046	52.2	13,994	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	1,337	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	3,485	
Total Zinc	0	0		0	118.229	120	32,143	Chem Translator of 0.986 applied
Acrolein	0	0		0	3	3.0	804	
Acrylamide	0	0		0	N/A	N/A	N/A	
Acrylonitrile	0	0		0	130	130	34,848	
Benzene	0	0		0	130	130	34,848	
Bromoform	0	0		0	370	370	99,184	
Carbon Tetrachloride	0	0		0	560	560	150,116	
Chlorobenzene	0	0		0	240	240	64,335	
Chlorodibromomethane	0	0		0	N/A	N/A	N/A	
2-Chloroethyl Vinyl Ether	0	0		0	3,500	3,500	938,226	
Chloroform	0	0		0	390	390	104,545	
Dichlorobromomethane	0	0		0	N/A	N/A	N/A	
1,2-Dichloroethane	0	0		0	3,100	3,100	831,000	
1,1-Dichloroethylene	0	0		0	1,500	1,500	402,097	
1,2-Dichloropropane	0	0		0	2,200	2,200	589,742	
1,3-Dichloropropylene	0	0		0	61	61.0	16,352	
Ethylbenzene	0	0		0	580	580	155,477	
Methyl Bromide	0	0		0	110	110	29,487	
Methyl Chloride	0	0		0	5,500	5,500	1,474,355	

Methylene Chloride	0	0	0	2,400	2,400	643,355	
1,1,2,2-Tetrachloroethane	0	0	0	210	210	56,294	
Tetrachloroethylene	0	0	0	140	140	37,529	
Toluene	0	0	0	330	330	88,461	
1,2-trans-Dichloroethylene	0	0	0	1,400	1,400	375,290	
1,1,1-Trichloroethane	0	0	0	610	610	163,519	
1,1,2-Trichloroethane	0	0	0	680	680	182,284	
Trichloroethylene	0	0	0	450	450	120,629	
Vinyl Chloride	0	0	0	N/A	N/A	N/A	
2-Chlorophenol	0	0	0	110	110	29,487	
2,4-Dichlorophenol	0	0	0	340	340	91,142	
2,4-Dimethylphenol	0	0	0	130	130	34,848	
4,6-Dinitro-o-Cresol	0	0	0	16	16.0	4,289	
2,4-Dinitrophenol	0	0	0	130	130	34,848	
2-Nitrophenol	0	0	0	1,600	1,600	428,903	
4-Nitrophenol	0	0	0	470	470	125,990	
p-Chloro-m-Cresol	0	0	0	500	500	134,032	
Pentachlorophenol	0	0	0	6.693	6.69	1,794	
Phenol	0	0	0	N/A	N/A	N/A	
2,4,6-Trichlorophenol	0	0	0	91	91.0	24,394	
Acenaphthene	0	0	0	17	17.0	4,557	
Anthracene	0	0	0	N/A	N/A	N/A	
Benzidine	0	0	0	59	59.0	15,816	
Benzo(a)Anthracene	0	0	0	0.1	0.1	26.8	
Benzo(a)Pyrene	0	0	0	N/A	N/A	N/A	
3,4-Benzo fluoranthene	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	1,608,387	
Bis(2-Chloroisopropyl)Ether	0	0	0	N/A	N/A	N/A	
Bis(2-Ethylhexyl)Phthalate	0	0	0	910	910	243,939	
4-Bromophenyl Phenyl Ether	0	0	0	54	54.0	14,475	
Butyl Benzyl Phthalate	0	0	0	35	35.0	9,382	
2-Chloronaphthalene	0	0	0	N/A	N/A	N/A	
Chrysene	0	0	0	N/A	N/A	N/A	
Dibenzo(a,h)Anthracene	0	0	0	N/A	N/A	N/A	
1,2-Dichlorobenzene	0	0	0	160	160	42,890	
1,3-Dichlorobenzene	0	0	0	69	69.0	18,496	
1,4-Dichlorobenzene	0	0	0	150	150	40,210	
3,3-Dichlorobenzidine	0	0	0	N/A	N/A	N/A	
Diethyl Phthalate	0	0	0	800	800	214,452	
Dimethyl Phthalate	0	0	0	500	500	134,032	
Di-n-Butyl Phthalate	0	0	0	21	21.0	5,629	
2,4-Dinitrotoluene	0	0	0	320	320	85,781	
2,6-Dinitrotoluene	0	0	0	200	200	53,613	
1,2-Diphenylhydrazine	0	0	0	3	3.0	804	
Fluoranthene	0	0	0	40	40.0	10,723	

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	536
Hexachlorocyclopentadiene	0	0		0	1	1.0	268
Hexachloroethane	0	0		0	12	12.0	3,217
Indeno(1,2,3-cd)Pyrene	0	0		0	N/A	N/A	N/A
Isophorone	0	0		0	2,100	2,100	562,936
Naphthalene	0	0		0	43	43.0	11,527
Nitrobenzene	0	0		0	810	810	217,132
n-Nitrosodimethylamine	0	0		0	3,400	3,400	911,419
n-Nitrosodi-n-Propylamine	0	0		0	N/A	N/A	N/A
n-Nitrosodiphenylamine	0	0		0	59	59.0	15,816
Phenanthrene	0	0		0	1	1.0	268
Pyrene	0	0		0	N/A	N/A	N/A
1,2,4-Trichlorobenzene	0	0		0	26	26.0	6,970
Aldrin	0	0		0	0.1	0.1	26.8
alpha-BHC	0	0		0	N/A	N/A	N/A
beta-BHC	0	0		0	N/A	N/A	N/A
gamma-BHC	0	0		0	N/A	N/A	N/A
Chlordane	0	0		0	0.0043	0.004	1.15
4,4-DDT	0	0		0	0.001	0.001	0.27
4,4-DDE	0	0		0	0.001	0.001	0.27
4,4-DDD	0	0		0	0.001	0.001	0.27
Dieldrin	0	0		0	0.056	0.056	15.0
alpha-Endosulfan	0	0		0	0.056	0.056	15.0
beta-Endosulfan	0	0		0	0.056	0.056	15.0
Endosulfan Sulfate	0	0		0	N/A	N/A	N/A
Endrin	0	0		0	0.036	0.036	9.65
Endrin Aldehyde	0	0		0	N/A	N/A	N/A
Heptachlor	0	0		0	0.0038	0.004	1.02
Heptachlor Epoxide	0	0		0	0.0038	0.004	1.02
Toxaphene	0	0		0	0.0002	0.0002	0.054

THH

CCT (min): 720

THH PMF: 0.555

Analysis Hardness (mg/l): N/A

Analysis pH: N/A

PWS PMF: 0.563

Pollutants	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Total Dissolved Solids (PWS)	0	0		0	500,000	500,000	#####	WQC applied at RMI 10 with a design stream flow of 2950 cfs
Chloride (PWS)	0	0		0	250,000	250,000	69,075,570	WQC applied at RMI 10 with a design stream flow of 2950 cfs
Sulfate (PWS)	0	0		0	250,000	250,000	69,075,570	WQC applied at RMI 10 with a design stream flow of 2950 cfs
Total Aluminum	0	0		0	N/A	N/A	N/A	
Total Antimony	0	0		0	5.6	5.6	1,501	
Total Arsenic	0	0		0	10	10.0	2,681	
Total Barium	0	0		0	2,400	2,400	643,355	
Total Boron	0	0		0	3,100	3,100	831,000	
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	1,072	
Dissolved Iron	0	0	0	300	300	80,419	
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	268,065	
Total Mercury	0	0	0	0.050	0.05	13.4	
Total Nickel	0	0	0	610	610	163,519	
Total Phenols (Phenolics) (PWS)	0	0	0	5	5.0	1,382	WQC applied at RMI 10 with a design stream flow of 2950 cfs
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	64.3	
Total Zinc	0	0	0	N/A	N/A	N/A	
Acrolein	0	0	0	3	3.0	804	
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	26,806	
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	1,528	
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	8,846	
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	18,228	
Methyl Bromide	0	0	0	100	100.0	26,806	
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	15,280	
1,2-trans-Dichloroethylene	0	0	0	100	100.0	26,806	
1,1,1-Trichloroethane	0	0	0	10,000	10,000	2,680,646	
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	8,042	
2,4-Dichlorophenol	0	0	0	10	10.0	2,681	
2,4-Dimethylphenol	0	0	0	100	100.0	26,806	

4,6-Dinitro-o-Cresol	0	0		0	2	2.0	536	
2,4-Dinitrophenol	0	0		0	10	10.0	2,681	
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	1,072,258	
2,4,6-Trichlorophenol	0	0		0	N/A	N/A	N/A	
Acenaphthene	0	0		0	70	70.0	18,765	
Anthracene	0	0		0	300	300	80,419	
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	53,613	
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	26.8	
2-Chloronaphthalene	0	0		0	800	800	214,452	
Chrysene	0	0		0	N/A	N/A	N/A	
Dibenzo(a,h)Anthracene	0	0		0	N/A	N/A	N/A	
1,2-Dichlorobenzene	0	0		0	1,000	1,000	268,065	
1,3-Dichlorobenzene	0	0		0	7	7.0	1,876	
1,4-Dichlorobenzene	0	0		0	300	300	80,419	
3,3-Dichlorobenzidine	0	0		0	N/A	N/A	N/A	
Diethyl Phthalate	0	0		0	600	600	160,839	
Dimethyl Phthalate	0	0		0	2,000	2,000	536,129	
Di-n-Butyl Phthalate	0	0		0	20	20.0	5,361	
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	5,361	
Fluorene	0	0		0	50	50.0	13,403	
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	1,072	
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	9,114	
Naphthalene	0	0		0	N/A	N/A	N/A	
Nitrobenzene	0	0		0	10	10.0	2,681	
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	5,361
1,2,4-Trichlorobenzene	0	0		0	0.07	0.07	18.8
Aldrin	0	0		0	N/A	N/A	N/A
alpha-BHC	0	0		0	N/A	N/A	N/A
beta-BHC	0	0		0	N/A	N/A	N/A
gamma-BHC	0	0		0	4.2	4.2	1,126
Chlordane	0	0		0	N/A	N/A	N/A
4,4-DDT	0	0		0	N/A	N/A	N/A
4,4-DDE	0	0		0	N/A	N/A	N/A
4,4-DDD	0	0		0	N/A	N/A	N/A
Dieldrin	0	0		0	N/A	N/A	N/A
alpha-Endosulfan	0	0		0	20	20.0	5,361
beta-Endosulfan	0	0		0	20	20.0	5,361
Endosulfan Sulfate	0	0		0	20	20.0	5,361
Endrin	0	0		0	0.03	0.03	8.04
Endrin Aldehyde	0	0		0	1	1.0	268
Heptachlor	0	0		0	N/A	N/A	N/A
Heptachlor Epoxide	0	0		0	N/A	N/A	N/A
Toxaphene	0	0		0	N/A	N/A	N/A

CRL

CCT (min): 720

PMF: 0.771

Analysis Hardness (mg/l):

N/A

Analysis pH:

N/A

Pollutants	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Total Dissolved Solids (PWS)	0	0		0	N/A	N/A	N/A	
Chloride (PWS)	0	0		0	N/A	N/A	N/A	
Sulfate (PWS)	0	0		0	N/A	N/A	N/A	
Total Aluminum	0	0		0	N/A	N/A	N/A	
Total Antimony	0	0		0	N/A	N/A	N/A	
Total Arsenic	0	0		0	N/A	N/A	N/A	
Total Barium	0	0		0	N/A	N/A	N/A	
Total Boron	0	0		0	N/A	N/A	N/A	
Total Cadmium	0	0		0	N/A	N/A	N/A	
Total Chromium (III)	0	0		0	N/A	N/A	N/A	
Hexavalent Chromium	0	0		0	N/A	N/A	N/A	
Total Cobalt	0	0		0	N/A	N/A	N/A	
Total Copper	0	0		0	N/A	N/A	N/A	
Free Cyanide	0	0		0	N/A	N/A	N/A	
Dissolved Iron	0	0		0	N/A	N/A	N/A	
Total Iron	0	0		0	N/A	N/A	N/A	
Total Lead	0	0		0	N/A	N/A	N/A	
Total Manganese	0	0		0	N/A	N/A	N/A	
Total Mercury	0	0		0	N/A	N/A	N/A	
Total Nickel	0	0		0	N/A	N/A	N/A	
Total Phenols (Phenolics) (PWS)	0	0		0	N/A	N/A	N/A	

Total Selenium	0	0		0	N/A	N/A	N/A
Total Silver	0	0		0	N/A	N/A	N/A
Total Thallium	0	0		0	N/A	N/A	N/A
Total Zinc	0	0		0	N/A	N/A	N/A
Acrolein	0	0		0	N/A	N/A	N/A
Acrylamide	0	0		0	0.07	0.07	70.7
Acrylonitrile	0	0		0	0.06	0.06	60.6
Benzene	0	0		0	0.58	0.58	586
Bromoform	0	0		0	7	7.0	7,071
Carbon Tetrachloride	0	0		0	0.4	0.4	404
Chlorobenzene	0	0		0	N/A	N/A	N/A
Chlorodibromomethane	0	0		0	0.8	0.8	808
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	960
1,2-Dichloroethane	0	0		0	9.9	9.9	10,001
1,1-Dichloroethylene	0	0		0	N/A	N/A	N/A
1,2-Dichloropropane	0	0		0	0.9	0.9	909
1,3-Dichloropropylene	0	0		0	0.27	0.27	273
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	20,204
1,1,2,2-Tetrachloroethane	0	0		0	0.2	0.2	202
Tetrachloroethylene	0	0		0	10	10.0	10,102
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	556
Trichloroethylene	0	0		0	0.6	0.6	606
Vinyl Chloride	0	0		0	0.02	0.02	20.2
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	30.3
Phenol	0	0		0	N/A	N/A	N/A
2,4,6-Trichlorophenol	0	0		0	1.5	1.5	1,515
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	0.1
Benzo(a)Anthracene	0	0		0	0.001	0.001	1.01

Benzo(a)Pyrene	0	0		0	0.0001	0.0001	0.1	
3,4-Benzofluoranthene	0	0		0	0.001	0.001	1.01	
Benzo(k)Fluoranthene	0	0		0	0.01	0.01	10.1	
Bis(2-Chloroethyl)Ether	0	0		0	0.03	0.03	30.3	
Bis(2-Chloroisopropyl)Ether	0	0		0	N/A	N/A	N/A	
Bis(2-Ethylhexyl)Phthalate	0	0		0	0.32	0.32	323	
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	121	
Dibenzo(a,h)Anthracene	0	0		0	0.0001	0.0001	0.1	
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	50.5	
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	50.5	
2,6-Dinitrotoluene	0	0		0	0.05	0.05	50.5	
1,2-Diphenylhydrazine	0	0		0	0.03	0.03	30.3	
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	0.081	
Hexachlorobutadiene	0	0		0	0.01	0.01	10.1	
Hexachlorocyclopentadiene	0	0		0	N/A	N/A	N/A	
Hexachloroethane	0	0		0	0.1	0.1	101	
Indeno(1,2,3-cd)Pyrene	0	0		0	0.001	0.001	1.01	
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	0.71	
n-Nitrosodi-n-Propylamine	0	0		0	0.005	0.005	5.05	
n-Nitrosodiphenylamine	0	0		0	3.3	3.3	3,334	
Phenanthrene	0	0		0	N/A	N/A	N/A	
Pyrene	0	0		0	N/A	N/A	N/A	
1,2,4-Trichlorobenzene	0	0		0	N/A	N/A	N/A	
Aldrin	0	0		0	0.0000008	8.00E-07	0.0008	
alpha-BHC	0	0		0	0.0004	0.0004	0.4	
beta-BHC	0	0		0	0.008	0.008	8.08	
gamma-BHC	0	0		0	N/A	N/A	N/A	
Chlordane	0	0		0	0.0003	0.0003	0.3	
4,4-DDT	0	0		0	0.00003	0.00003	0.03	
4,4-DDE	0	0		0	0.00002	0.00002	0.02	
4,4-DDD	0	0		0	0.0001	0.0001	0.1	
Dieldrin	0	0		0	0.000001	0.000001	0.001	

alpha-Endosulfan	0	0		0	N/A	N/A	N/A
beta-Endosulfan	0	0		0	N/A	N/A	N/A
Endosulfan Sulfate	0	0		0	N/A	N/A	N/A
Endrin	0	0		0	N/A	N/A	N/A
Endrin Aldehyde	0	0		0	N/A	N/A	N/A
Heptachlor	0	0		0	0.000006	0.000006	0.006
Heptachlor Epoxide	0	0		0	0.00003	0.00003	0.03
Toxaphene	0	0		0	0.0007	0.0007	0.71

Recommended WQBELs & Monitoring Requirements

No. Samples/Month:

4

Pollutants	Mass Limits		Concentration Limits				Governing WQBEL	WQBEL Basis	Comments
	AML (lbs/day)	MDL (lbs/day)	AML	MDL	IMAX	Units			

Other Pollutants without Limits or Monitoring

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

Pollutants	Governing WQBEL	Units	Comments
Total Dissolved Solids (PWS)	138,151	mg/L	Discharge Conc ≤ 10% WQBEL
Chloride (PWS)	69,076	mg/L	Discharge Conc ≤ 10% WQBEL
Bromide	N/A	N/A	No WQS
Sulfate (PWS)	69,076	mg/L	Discharge Conc ≤ 10% WQBEL
Total Aluminum	19,011	µg/L	Discharge Conc ≤ 10% WQBEL
Total Antimony	N/A	N/A	Discharge Conc < TQL
Total Arsenic	2,681	µg/L	Discharge Conc ≤ 10% WQBEL
Total Barium	532,315	µg/L	Discharge Conc ≤ 10% WQBEL
Total Beryllium	N/A	N/A	No WQS
Total Boron	205,321	µg/L	Discharge Conc ≤ 10% WQBEL
Total Cadmium	54.4	µg/L	Discharge Conc < TQL
Total Chromium (III)	23,119	µg/L	Discharge Conc < TQL
Hexavalent Chromium	413	µg/L	Discharge Conc < TQL
Total Cobalt	2,408	µg/L	Discharge Conc ≤ 10% WQBEL
Total Copper	0.36	mg/L	Discharge Conc < TQL
Free Cyanide	558	µg/L	Discharge Conc ≤ 25% WQBEL
Total Cyanide	N/A	N/A	No WQS
Dissolved Iron	80,419	µg/L	Discharge Conc ≤ 10% WQBEL
Total Iron	723,120	µg/L	Discharge Conc ≤ 10% WQBEL

Total Lead	854	µg/L	Discharge Conc ≤ 10% WQBEL
Total Manganese	268,065	µg/L	Discharge Conc ≤ 10% WQBEL
Total Mercury	13.4	µg/L	Discharge Conc < TQL
Total Nickel	11,954	µg/L	Discharge Conc ≤ 10% WQBEL
Total Phenols (Phenolics) (PWS)	1,382	µg/L	Discharge Conc ≤ 10% WQBEL
Total Selenium	1,337	µg/L	Discharge Conc ≤ 10% WQBEL
Total Silver	96.9	µg/L	Discharge Conc < TQL
Total Thallium	64.3	µg/L	Discharge Conc < TQL
Total Zinc	3.05	mg/L	Discharge Conc ≤ 10% WQBEL
Total Molybdenum	N/A	N/A	No WQS
Acrolein	76.0	µg/L	Discharge Conc < TQL
Acrylamide	70.7	µg/L	Discharge Conc ≤ 25% WQBEL
Acrylonitrile	60.6	µg/L	Discharge Conc < TQL
Benzene	586	µg/L	Discharge Conc < TQL
Bromoform	7,071	µg/L	Discharge Conc < TQL
Carbon Tetrachloride	404	µg/L	Discharge Conc < TQL
Chlorobenzene	26,806	µg/L	Discharge Conc < TQL
Chlorodibromomethane	808	µg/L	Discharge Conc < TQL
Chloroethane	N/A	N/A	No WQS
2-Chloroethyl Vinyl Ether	456,270	µg/L	Discharge Conc < TQL
Chloroform	1,528	µg/L	Discharge Conc ≤ 25% WQBEL
Dichlorobromomethane	960	µg/L	Discharge Conc < TQL
1,1-Dichloroethane	N/A	N/A	No WQS
1,2-Dichloroethane	10,001	µg/L	Discharge Conc < TQL
1,1-Dichloroethylene	8,846	µg/L	Discharge Conc < TQL
1,2-Dichloropropane	909	µg/L	Discharge Conc < TQL
1,3-Dichloropropylene	273	µg/L	Discharge Conc < TQL
1,4-Dioxane	N/A	N/A	No WQS
Ethylbenzene	18,228	µg/L	Discharge Conc < TQL
Methyl Bromide	13,942	µg/L	Discharge Conc < TQL
Methyl Chloride	709,753	µg/L	Discharge Conc < TQL
Methylene Chloride	20,204	µg/L	Discharge Conc < TQL
1,1,2,2-Tetrachloroethane	202	µg/L	Discharge Conc < TQL
Tetrachloroethylene	10,102	µg/L	Discharge Conc < TQL
Toluene	15,280	µg/L	Discharge Conc ≤ 25% WQBEL
1,2-trans-Dichloroethylene	26,806	µg/L	Discharge Conc < TQL
1,1,1-Trichloroethane	76,045	µg/L	Discharge Conc < TQL
1,1,2-Trichloroethane	556	µg/L	Discharge Conc < TQL
Trichloroethylene	606	µg/L	Discharge Conc < TQL
Vinyl Chloride	20.2	µg/L	Discharge Conc < TQL
2-Chlorophenol	8,042	µg/L	Discharge Conc < TQL
2,4-Dichlorophenol	2,681	µg/L	Discharge Conc < TQL
2,4-Dimethylphenol	16,730	µg/L	Discharge Conc < TQL
4,6-Dinitro-o-Cresol	536	µg/L	Discharge Conc < TQL
2,4-Dinitrophenol	2,681	µg/L	Discharge Conc < TQL
2-Nitrophenol	202,787	µg/L	Discharge Conc < TQL

4-Nitrophenol	58,301	µg/L	Discharge Conc < TQL
p-Chloro-m-Cresol	4,056	µg/L	Discharge Conc < TQL
Pentachlorophenol	30.3	µg/L	Discharge Conc < TQL
Phenol	1,072,258	µg/L	Discharge Conc < TQL
2,4,6-Trichlorophenol	1,515	µg/L	Discharge Conc < TQL
Acenaphthene	2,104	µg/L	Discharge Conc < TQL
Acenaphthylene	N/A	N/A	No WQS
Anthracene	80,419	µg/L	Discharge Conc < TQL
Benzidine	0.1	µg/L	Discharge Conc < TQL
Benzo(a)Anthracene	1.01	µg/L	Discharge Conc < TQL
Benzo(a)Pyrene	0.1	µg/L	Discharge Conc < TQL
3,4-Benzofluoranthene	1.01	µg/L	Discharge Conc < TQL
Benzo(ghi)Perylene	N/A	N/A	No WQS
Benzo(k)Fluoranthene	10.1	µg/L	Discharge Conc < TQL
Bis(2-Chloroethoxy)Methane	N/A	N/A	No WQS
Bis(2-Chloroethyl)Ether	30.3	µg/L	Discharge Conc < TQL
Bis(2-Chloroisopropyl)Ether	53,613	µg/L	Discharge Conc < TQL
Bis(2-Ethylhexyl)Phthalate	323	µg/L	Discharge Conc < TQL
4-Bromophenyl Phenyl Ether	6,844	µg/L	Discharge Conc < TQL
Butyl Benzyl Phthalate	26.8	µg/L	Discharge Conc < TQL
2-Chloronaphthalene	214,452	µg/L	Discharge Conc < TQL
4-Chlorophenyl Phenyl Ether	N/A	N/A	No WQS
Chrysene	121	µg/L	Discharge Conc < TQL
Dibenzo(a,h)Anthracene	0.1	µg/L	Discharge Conc < TQL
1,2-Dichlorobenzene	20,786	µg/L	Discharge Conc < TQL
1,3-Dichlorobenzene	1,876	µg/L	Discharge Conc < TQL
1,4-Dichlorobenzene	18,504	µg/L	Discharge Conc < TQL
3,3-Dichlorobenzidine	50.5	µg/L	Discharge Conc < TQL
Diethyl Phthalate	101,393	µg/L	Discharge Conc < TQL
Dimethyl Phthalate	63,371	µg/L	Discharge Conc < TQL
Di-n-Butyl Phthalate	2,788	µg/L	Discharge Conc < TQL
2,4-Dinitrotoluene	50.5	µg/L	Discharge Conc < TQL
2,6-Dinitrotoluene	50.5	µg/L	Discharge Conc < TQL
Di-n-Octyl Phthalate	N/A	N/A	No WQS
1,2-Diphenylhydrazine	30.3	µg/L	Discharge Conc < TQL
Fluoranthene	5,070	µg/L	Discharge Conc < TQL
Fluorene	13,403	µg/L	Discharge Conc < 25% WQBEL
Hexachlorobenzene	0.081	µg/L	Discharge Conc < TQL
Hexachlorobutadiene	10.1	µg/L	Discharge Conc < TQL
Hexachlorocyclopentadiene	127	µg/L	Discharge Conc < TQL
Hexachloroethane	101	µg/L	Discharge Conc < TQL
Indeno(1,2,3-cd)Pyrene	1.01	µg/L	Discharge Conc < TQL
Isophorone	9,114	µg/L	Discharge Conc < TQL
Naphthalene	3,549	µg/L	Discharge Conc < TQL
Nitrobenzene	2,681	µg/L	Discharge Conc < TQL
n-Nitrosodimethylamine	0.71	µg/L	Discharge Conc < TQL

n-Nitrosodi-n-Propylamine	5.05	µg/L	Discharge Conc < TQL
n-Nitrosodiphenylamine	3,334	µg/L	Discharge Conc < TQL
Phenanthrene	127	µg/L	Discharge Conc < TQL
Pyrene	5,361	µg/L	Discharge Conc < TQL
1,2,4-Trichlorobenzene	18.8	µg/L	Discharge Conc < TQL
Aldrin	0.0008	µg/L	Discharge Conc < TQL
alpha-BHC	0.4	µg/L	Discharge Conc < TQL
beta-BHC	8.08	µg/L	Discharge Conc < TQL
gamma-BHC	24.1	µg/L	Discharge Conc < TQL
delta BHC	N/A	N/A	No WQS
Chlordane	0.3	µg/L	Discharge Conc < TQL
4,4-DDT	0.03	µg/L	Discharge Conc < TQL
4,4-DDE	0.02	µg/L	Discharge Conc < TQL
4,4-DDD	0.1	µg/L	Discharge Conc < TQL
Dieldrin	0.001	µg/L	Discharge Conc < TQL
alpha-Endosulfan	5.58	µg/L	Discharge Conc < TQL
beta-Endosulfan	5.58	µg/L	Discharge Conc < TQL
Endosulfan Sulfate	5,361	µg/L	Discharge Conc < TQL
Endrin	2.18	µg/L	Discharge Conc < TQL
Endrin Aldehyde	268	µg/L	Discharge Conc < TQL
Heptachlor	0.006	µg/L	Discharge Conc < TQL
Heptachlor Epoxide	0.03	µg/L	Discharge Conc < TQL
Toxaphene	0.054	µg/L	Discharge Conc < TQL

WQM7.0 Model Results

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
18A	42122	ALLEGHENY RIVER			11.360	720.00	5000.00	0.00100	0.00	<input checked="" type="checkbox"/>
Stream Data										
Design Cond.	LFY	Trib Flow	Stream Flow	Rch Trav Time (days)	Rch Velocity (fps)	WD Ratio	Rch Width (ft)	Rch Depth (ft)	Tributary Temp (°C)	Stream pH
	(cfsm)	(cfs)	(cfs)							(°C)
Q7-10	0.250	0.00	0.00	0.000	0.000	0.0	1500.00	12.00	20.00	7.00
Q1-10		0.00	0.00	0.000	0.000				0.00	0.00
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		
Plum Creek STP		PA0026417	3.9000	3.9000	3.9000	0.000	25.00	7.00		
Parameter Data										
Parameter Name			Disc Conc (mg/L)	Trib Conc (mg/L)	Stream Conc (mg/L)	Fate Coef (1/days)				
CBOD5			25.00	2.00	0.00	1.50				
Dissolved Oxygen			3.00	8.24	0.00	0.00				
NH3-N			25.00	0.00	0.00	0.70				

Input Data WQM 7.0

SWP Basin	Stream Code	Stream Name	RMI	Elevation	Drainage Area	Slope	PWS Withdrawal	Apply FC
				(ft)	(sq mi)	(ft/ft)	(mgd)	
18A		42122 ALLEGHENY RIVER	10.000	713.00	5200.00	0.00100	0.00	<input checked="" type="checkbox"/>

Stream Data

Design Cond.	LFY	Trib Flow	Stream Flow	Rch Trav Time	Rch Velocity	WD Ratio	Rch Width	Rch Depth	Tributary Temp	pH	Stream Temp	pH
	(cfsm)	(cfs)	(cfs)	(days)	(fps)		(ft)	(ft)	(°C)		(°C)	
Q7-10	0.250	0.00	0.00	0.000	0.000	0.0	1500.00	12.00	20.00	7.00	0.00	0.00
Q1-10		0.00	0.00	0.000	0.000							
Q30-10		0.00	0.00	0.000	0.000							

Discharge Data

Name	Permit Number	Existing Disc Flow	Permitted Disc Flow	Design Disc Flow	Reserve Factor	Disc Temp	Disc pH
		(mgd)	(mgd)	(mgd)			
		0.0000	0.0000	0.0000	0.000	25.00	7.00
Parameter Data							
Parameter Name		Disc Conc	Trib Conc	Stream Conc	Fate Coef		
		(mg/L)	(mg/L)	(mg/L)	(1/days)		
CBOD5		25.00	2.00	0.00	1.50		
Dissolved Oxygen		3.00	8.24	0.00	0.00		
NH3-N		25.00	0.00	0.00	0.70		

WQM 7.0 Modeling Specifications

Parameters	Both	Use Inputted Q1-10 and Q30-10 Flows	<input checked="" type="checkbox"/>
WLA Method	EMPR	Use Inputted W/D Ratio	<input type="checkbox"/>
Q1-10/Q7-10 Ratio	0.64	Use Inputted Reach Travel Times	<input type="checkbox"/>
Q30-10/Q7-10 Ratio	1.36	Temperature Adjust Kr	<input checked="" type="checkbox"/>
D.O. Saturation	85.00%	Use Balanced Technology	<input checked="" type="checkbox"/>
D.O. Goal	5		

WQM 7.0 Hydrodynamic Outputs

SWP Basin			Stream Code		Stream Name							
18A			42122		ALLEGHENY RIVER							
RMI	Stream Flow	PWS With	Net Stream Flow	Disc Analysis Flow	Reach Slope	Depth	Width	W/D Ratio	Velocity	Reach Trav Time	Analysis Temp	Analysis pH
	(cfs)	(cfs)	(cfs)	(cfs)	(ft/ft)	(ft)	(ft)		(fps)	(days)	(°C)	
Q7-10 Flow												
11.360	1250.00	0.00	1250.00	6.0333	0.00100	12	1500	125	0.07	1.191	20.02	7.00
Q1-10 Flow												
11.360	800.00	0.00	800.00	6.0333	0.00100	NA	NA	NA	0.04	1.856	20.04	7.00
Q30-10 Flow												
11.360	1700.00	0.00	1700.00	6.0333	0.00100	NA	NA	NA	0.09	0.877	20.02	7.00

WQM 7.0 D.O. Simulation

<u>SWP Basin</u>	<u>Stream Code</u>	<u>Stream Name</u>		
18A	42122	ALLEGHENY RIVER		
<u>RMI</u>	<u>Total Discharge Flow (mgd)</u>	<u>Analysis Temperature (°C)</u>	<u>Analysis pH</u>	
11.360	3.900	20.024	7.000	
<u>Reach Width (ft)</u>	<u>Reach Depth (ft)</u>	<u>Reach WDRatio</u>	<u>Reach Velocity (fps)</u>	
1500.000	12.000	125.000	0.070	
<u>Reach CBOD5 (mg/L)</u>	<u>Reach Kc (1/days)</u>	<u>Reach NH3-N (mg/L)</u>	<u>Reach Kn (1/days)</u>	
2.11	0.041	0.12	0.701	
<u>Reach DO (mg/L)</u>	<u>Reach Kr (1/days)</u>	<u>Kr Equation</u>	<u>Reach DO Goal (mg/L)</u>	
8.218	0.082	O'Connor	5	
<u>Reach Travel Time (days)</u>	<u>Subreach Results</u>			
1.191	TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
	0.119	2.10	0.11	7.78
	0.238	2.09	0.10	7.78
	0.357	2.08	0.09	7.78
	0.476	2.07	0.09	7.78
	0.596	2.06	0.08	7.78
	0.715	2.05	0.07	7.78
	0.834	2.04	0.07	7.78
	0.953	2.03	0.06	7.78
	1.072	2.02	0.06	7.78
	1.191	2.01	0.05	7.78

WQM 7.0 Wasteload Allocations

<u>SWP Basin</u>	<u>Stream Code</u>	<u>Stream Name</u>
18A	42122	ALLEGHENY RIVER

NH3-N Acute Allocations

RMI	Discharge Name	Baseline Criterion (mg/L)	Baseline WLA (mg/L)	Multiple Criterion (mg/L)	Multiple WLA (mg/L)	Critical Reach	Percent Reduction
11.360	Plum Creek STP	16.71	50	16.71	50	0	0

NH3-N Chronic Allocations

RMI	Discharge Name	Baseline Criterion (mg/L)	Baseline WLA (mg/L)	Multiple Criterion (mg/L)	Multiple WLA (mg/L)	Critical Reach	Percent Reduction
11.360	Plum Creek STP	1.88	25	1.88	25	0	0

Dissolved Oxygen Allocations

RMI	Discharge Name	CBOD5		NH3-N		Dissolved Oxygen		Critical Reach	Percent Reduction
		Baseline (mg/L)	Multiple (mg/L)	Baseline (mg/L)	Multiple (mg/L)	Baseline (mg/L)	Multiple (mg/L)		
11.36	Plum Creek STP	25	25	25	25	3	3	0	0

WQM 7.0 Effluent Limits

SWP Basin	Stream Code	Stream Name					
		18A	42122	ALLEGHENY RIVER			
RMI	Name	Permit Number	Disc Flow (mgd)	Parameter	Effl. Limit 30-day Ave. (mg/L)	Effl. Limit Maximum (mg/L)	Effl. Limit Minimum (mg/L)
11.360	Plum Creek STP	PA0026417	3.900	CBOD5	25		
				NH3-N	25	50	
				Dissolved Oxygen			3

WET Test Evaluation Spreadsheet

WET Summary and Evaluation

Facility Name
Permit No.
Design Flow (MGD)
Q₇₋₁₀ Flow (cfs)
PMF_a
PMF_c

Penn Hills Plum Creek STP
PA0026417
3.9
2900
0.08
0.555

Species	Endpoint	Test Results (Pass/Fail)			
		Test Date	Test Date	Test Date	Test Date
Ceriodaphnia	Survival	PASS	PASS	PASS	PASS

Species	Endpoint	Test Results (Pass/Fail)			
		Test Date	Test Date	Test Date	Test Date
Ceriodaphnia	Reproduction	PASS	PASS	PASS	PASS

Species	Endpoint	Test Results (Pass/Fail)			
		Test Date	Test Date	Test Date	Test Date
Pimephales	Survival	PASS	PASS	PASS	PASS

Species	Endpoint	Test Results (Pass/Fail)			
		Test Date	Test Date	Test Date	Test Date
Pimephales	Growth	PASS	PASS	PASS	PASS

Reasonable Potential? NO

Permit Recommendations

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

DEP Whole Effluent Toxicity (WET) Analysis Spreadsheet

Type of Test	Chronic
Species Tested	Ceriodaphnia
Endpoint	Survival
TIWC (decimal)	0.02
No. Per Replicate	1
TST b value	0.75
TST alpha value	0.2

Facility Name

Penn Hills Plum Creek STP

Permit No.

PA0026417

Test Completion Date

Replicate	7/31/2018	
	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

Test Completion Date

Replicate	10/8/2019	
	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**

T-Test Result

Deg. of Freedom

Critical T Value

Pass or Fail **PASS**

Test Completion Date

Replicate	8/31/2020	
	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

Test Completion Date

Replicate	8/23/2021	
	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**

T-Test Result

Deg. of Freedom

Critical T Value

Pass or Fail **PASS**

DEP Whole Effluent Toxicity (WET) Analysis Spreadsheet						
Type of Test	Chronic			Facility Name		
Species Tested	Ceriodaphnia			Penn Hills Plum Creek STP		
Endpoint	Reproduction			Permit No.		
TIWC (decimal)	0.02			PA0026417		
No. Per Replicate	1					
TST b value	0.75					
TST alpha value	0.2					
Test Completion Date						
Replicate	7/31/2018			Replicate	Test Completion Date	
No.	Control	TIWC		No.	Control	TIWC
1	19	19		1	33	34
2	35	38		2	35	35
3	35	34		3	34	29
4	30	9		4	37	32
5	31	34		5	37	33
6	25	35		6	32	31
7	36	35		7	37	28
8	33	34		8	30	34
9	35	34		9	8	36
10	35	35		10	32	34
11				11		
12				12		
13				13		
14				14		
15				15		
Mean	31.400	30.700		Mean	31.500	32.600
Std Dev.	5.502	9.190		Std Dev.	8.608	2.591
# Replicates	10	10		# Replicates	10	10
T-Test Result	2.2445			T-Test Result	4.0809	
Deg. of Freedom	14			Deg. of Freedom	16	
Critical T Value	0.8681			Critical T Value	0.8647	
Pass or Fail	PASS			Pass or Fail	PASS	
Test Completion Date						
Replicate	8/31/2020			Replicate	Test Completion Date	
No.	Control	TIWC		No.	Control	TIWC
1	32	28		1	23	27
2	21	13		2	28	27
3	30	31		3	23	29
4	25	36		4	26	21
5	25	23		5	28	28
6	21	27		6	19	31
7	23	31		7	37	20
8	35	30		8	29	29
9	33	32		9	34	31
10	31	29		10	26	20
11				11		
12				12		
13				13		
14				14		
15				15		
Mean	27.600	28.000		Mean	27.300	26.300
Std Dev.	5.190	6.272		Std Dev.	5.293	4.347
# Replicates	10	10		# Replicates	10	10
T-Test Result	3.1275			T-Test Result	3.1290	
Deg. of Freedom	15			Deg. of Freedom	17	
Critical T Value	0.8662			Critical T Value	0.8633	
Pass or Fail	PASS			Pass or Fail	PASS	

DEP Whole Effluent Toxicity (WET) Analysis Spreadsheet

Type of Test	Chronic
Species Tested	Pimephales
Endpoint	Survival
TIWC (decimal)	0.02
No. Per Replicate	10
TST b value	0.75
TST alpha value	0.25

Facility Name
Penn Hills Plum Creek STP
Permit No.
PA0026417

Replicate	Test Completion Date	
	No.	Control
1	0.9	0.8
2	0.6	0.9
3	0.9	0.8
4	0.89	0.6
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		

Mean 0.823 0.775
 Std Dev. 0.148 0.126
 # Replicates 4 4

T-Test Result 3.9754
 Deg. of Freedom 5
 Critical T Value 0.7267
 Pass or Fail **PASS**

Replicate	Test Completion Date	
	No.	Control
1	0.9	0.5
2	0.9	0.9
3	1	0.7
4	1	0.7
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		

Mean 0.950 0.700
 Std Dev. 0.058 0.163
 # Replicates 4 4

T-Test Result 1.8990
 Deg. of Freedom 3
 Critical T Value 0.7649
 Pass or Fail **PASS**

Replicate	Test Completion Date	
	No.	Control
1	1	1
2	0.2	1
3	1	1
4	1	1
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		

Mean 0.800 1.000
 Std Dev. 0.400 0.000
 # Replicates 4 4

T-Test Result 3.3853
 Deg. of Freedom 3
 Critical T Value 0.7649
 Pass or Fail **PASS**

Replicate	Test Completion Date	
	No.	Control
1	1	0.9
2	1	0.9
3	1	1
4	1	0.9
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		

Mean 1.000 0.925
 Std Dev. 0.000 0.050
 # Replicates 4 4

T-Test Result 15.8823
 Deg. of Freedom 3
 Critical T Value 0.7649
 Pass or Fail **PASS**

DEP Whole Effluent Toxicity (WET) Analysis Spreadsheet						
Type of Test	Chronic			Facility Name		
Species Tested	Pimephales			Penn Hills Plum Creek STP		
Endpoint	Growth			Permit No.		
TIWC (decimal)	0.02			PA0026417		
No. Per Replicate	10					
TST b value	0.75					
TST alpha value	0.25					
Test Completion Date						
Replicate No.	7/31/2018			Replicate No.	10/8/2019	
	Control	TIWC			Control	TIWC
1	0.284	0.271		1	0.405	0.278
2	0.192	0.307		2	0.348	0.392
3	0.295	0.217		3	0.347	0.298
4	0.271	0.244		4	0.384	0.298
5				5		
6				6		
7				7		
8				8		
9				9		
10				10		
11				11		
12				12		
13				13		
14				14		
15				15		
Mean	0.261	0.260		Mean	0.371	0.318
Std Dev.	0.047	0.038		Std Dev.	0.028	0.051
# Replicates	4	4		# Replicates	4	4
T-Test Result	2.4753			T-Test Result	1.3552	
Deg. of Freedom	5			Deg. of Freedom	4	
Critical T Value	0.7267			Critical T Value	0.7407	
Pass or Fail	PASS			Pass or Fail	PASS	
Test Completion Date						
Replicate No.	9/1/2020			Replicate No.	8/24/2021	
	Control	TIWC			Control	TIWC
1	0.339	0.29		1	0.288	0.3
2	0.09	0.288		2	0.361	0.364
3	0.29	0.287		3	0.373	0.387
4	0.303	0.262		4	0.34	0.375
5				5		
6				6		
7				7		
8				8		
9				9		
10				10		
11				11		
12				12		
13				13		
14				14		
15				15		
Mean	0.256	0.282		Mean	0.340	0.357
Std Dev.	0.112	0.013		Std Dev.	0.038	0.039
# Replicates	4	4		# Replicates	4	4
T-Test Result	2.1149			T-Test Result	4.1959	
Deg. of Freedom	4			Deg. of Freedom	5	
Critical T Value	0.7407			Critical T Value	0.7267	
Pass or Fail	PASS			Pass or Fail	PASS	