Pennsylvania Department of Environmental Protection

Southwest Regional Office
CLEAN WATER PROGRAM

Application Type	**Renewal**	Application No.	**PA0101273**
Facility Type	**Industrial**	APS ID	**1095790**
Major / Minor	**Minor**	Authorization ID	**1452517**

NPDES PERMIT FACT SHEET INDIVIDUAL INDUSTRIAL WASTE (IW) AND IW STORMWATER

Applicant and Facility Information

Applicant Name	**BHB Ind, LLC**	Facility Name	**BHB Plastic Molding**
Applicant Address	116 Railroad Street	Facility Address	116 Railroad Street
	Cambridge Springs, PA 16403-1060		Cambridge Springs, PA 16403-1060
Applicant Contact	Steven Hills	Facility Contact	Same as Applicant
Applicant Phone	(814) 398-8011	Facility Phone	(814) 333-1660
Applicant email	bhbind@zoominternet.net	Facility email	Same as Applicant
Client ID	6753	Site ID	241198
SIC Code	3086	Municipality	Cambridge Springs Borough
SIC Description	Manufacturing - Plastics, Foam Products	County	Crawford
Date Application Received	July 6, 2023	EPA Waived?	Yes
Date Application Accepted		If No, Reason	

Purpose of Application: Renewal NPDES Permit Coverage

Summary of Review

On July 6, 2023, BHB Plastic Molding submitted an application to renew the NPDES Permit PA0101273 for their styrene molding manufacturing facility located in Cambridge Springs Borough, Crawford County. The Facility has a SIC Code of 3086 (Plastic foam products) and a NAICS code of 326140 (Polystyrene foam product manufacturing).

The facility discharges non-contact cooling water from the machines used to press the molds along with steam condensate and water leaks from the machines to the catch basins that then discharges to French Creek.

Permit history timeline

On December 5, 2017, the Department renewed the NPDES permit for BHB Plastic Molding, effective January 1, 2018, with an expiration date of December 31, 2022.

On February 3, 2020, the Department issued an Administrative Order, due to the permittee's failure to register for electronic Discharge Monitoring Reporting (eDMR) after several reminder letters. On August 4, 2020, BHB Industries became registered to use the Department's electronic Discharge Monitoring (eDMR) System.

On June 1, 2021, the Department issued an Administrative Order because the facility failed to submit monthly Discharge Monitoring Reports (DMRs) – either in paper form or electronically – for the period from January 2018 to March 2021.

On November 23, 2021, Crawford County Court of Common Pleas issued an order to BHB Industries. Beginning January 1, 2022, BHB Industries, was required to monitor the discharge effluent and report the results to the Department using the eDMR system.

Approve	Deny	Signatures	Date
X		Angela Rohrer / Environmental Engineering Specialist	August 13, 2025
X		Michael E. Fifth, P.E. / Environmental Engineer Manager	September 5, 2025

Summary of Review

On May 6, 2022, the Department issued an Administrative Order, due to permittee's failure to submit to the DEP payment for the annual fee.

On January 4, 2023, the Department issued a Notice of Violation because the permittee failed to submit a renewal application, as the NPDES permit had expired on December 31, 2022.

On January 31, 2024, the Department issued a Notice of Violation to BHB Industries because the facility failed to submit monitoring results using the eDMR for multiple monitoring periods.

A site visit was conducted by the Department on 11/30/2017. After observing the outfall location, it was discovered that the discharge was not directly to French Creek, but instead a dry swale. It was determined that the small discharge had low potential of reaching French Creek in low flow conditions and would infiltrate into the soil. Therefore, it was decided to relax the TRC sampling from 1/week to 2/month and chloride and total nickel sampling from 1/quarter to 1/6 months in the final permit.

The 2017 permit's Fact Sheet, under the Additional Considerations section, specified that the permittee should have a Preparedness, Prevention, and Contingency (PPC) Plan in place. However, this task remains outstanding, as the permittee provided a deficient PPC Plan with the renewal application. Consequently, within the 30-days comment period, BHB Plastic Molding must submit to the Department the updated PPC Plan, following the guidance contained in DEP's "Guidelines for the Development and Implementation of Environmental Emergency Response Plans" (DEP ID 400-2200-001).

A review of Discharge Monitoring Reports (DMRs) from 2023 to August 2025 revealed multiple exceedances of effluent limitations for Total Residual Chlorine and pH (see Table 1). Additionally, the facility has consistently submitted DMRs past their due dates.

Table 1: Exceedances of Effluent Limits

Parameter	Monitoring Period	SBC	DMR Value	Limit Value	Units
Total Residual Chlorine (TRC)	8/1/2023 - 8/31/2023	Average Monthly	0.71	0.5	mg/L
Total Residual Chlorine (TRC)	10/1/2023 - 10/31/2023	Average Monthly	0.6	0.5	mg/L
Total Residual Chlorine (TRC)	5/1/2024 - 5/31/2024	Average Monthly	0.75	0.5	mg/L
Total Residual Chlorine (TRC)	6/1/2024 - 6/30/2024	Average Monthly	1.03	0.5	mg/L
Total Residual Chlorine (TRC)	6/1/2024 - 6/30/2024	Daily Maximum	1.27	1.2	mg/L
Total Residual Chlorine (TRC)	7/1/2024 - 7/31/2024	Daily Maximum	1.2	1.2	mg/L
Total Residual Chlorine (TRC)	8/1/2024 - 8/31/2024	Daily Maximum	3.8	1.2	mg/L
Total Residual Chlorine (TRC)	8/1/2024 - 8/31/2024	Average Monthly	1.9	0.5	mg/L
Total Residual Chlorine (TRC)	1/1/2025 - 1/31/2025	Average Monthly	0.76	0.5	mg/L
Total Residual Chlorine (TRC)	4/1/2025 - 4/30/2025	Average Monthly	0.97	0.5	mg/L
Total Residual Chlorine (TRC)	4/1/2025 - 4/30/2025	Daily Maximum	1.41	1.2	mg/L
pH	2/1/2023 - 2/28/2023	Daily Minimum	5.9	6.0	S.U.
pH	2/1/2023 - 2/28/2023	Daily Maximum	10.1	9.0	S.U.
pH	3/1/2023 - 3/31/2023	Daily Minimum	5.9	6.0	S.U.

Summary of Review

pH	3/1/2023 - 2/31/2023	Daily Maximum	10.1	9.0	S.U.
pH	1/1/2024 - 1/31/2024	Daily Maximum	9.95	9.0	S.U.
pH	2/1/2024 - 2/29/2024	Daily Maximum	10.01	9.0	S.U.
pH	3/1/2024 - 3/31/2024	Daily Maximum	9.99	9.0	S.U.
pH	4/1/2024 - 4/30/2024	Daily Maximum	9.78	9.0	S.U.
pH	9/1/2024 - 9/30/2024	Daily Maximum	9.79	9.0	S.U.

The issuance of a final permit is conditional upon resolution of ongoing effluent limit excursions.

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.

Discharge, Receiving Waters and Water Supply Information

Outfall No.	001	Design Flow (MGD)	0.0075
Latitude	41º 48' 18.5"	Longitude	-80º 03' 33"
Quad Name	Cambridge Springs	Quad Code	0405
Wastewater Description:	Non-contact Cooling Water		

Receiving Waters	French Creek (WWF)	Stream Code	51591
NHD Com ID	127344575	RMI	50.26
Drainage Area	513 mi^2	Yield (cfs/mi^2)	0.075
Q_{7-10} Flow (cfs)	38.6	Q_{7-10} Basis	StreamStats
Elevation (ft)	1,147	Slope (ft/ft)	
Watershed No.	16-A	Chapter 93 Class.	WWF
Existing Use		Existing Use Qualifier	
Exceptions to Use		Exceptions to Criteria	
Assessment Status	Impaired		
Cause(s) of Impairment	Mercury		
Source(s) of Impairment	Source Unknown		
TMDL Status		Name	

Nearest Downstream Public Water Supply Intake	Aqua Pennsylvania, Inc. - Emlenton		
PWS Waters	Allegheny River	Flow at Intake (cfs)	1,376
PWS RMI	90.58	Distance from Outfall (mi)	84.38

Other Comments: Although the facility reported an average flow of 0.0046 MGD during production, a review of the Discharge Monitoring Reports (DMRs) revealed that the average flow over the last two years was actually 0.0075 MGD. This higher value was used in the calculations.

Development of Effluent Limitations

Outfall No. 001 **Design Flow (MGD)** 0.0075
Latitude 41º 48' 18.5" **Longitude** -80º 03' 33"
Wastewater Description: Non-Contact Cooling Water

Technology Based Effluent Limits

Regulatory Effluent Standards and Monitoring Requirements

Flow monitoring is required pursuant to 25 Pa. Code § 92a.61(d)(1).

Effluent standards for pH are also imposed on industrial wastes by 25 Pa. Code §§ 95.2(1).

Temperature limits will be imposed per the Department's "*Implementation Guidance for Temperature Criteria*." As a policy, DEP normally imposes a maximum temperature limit of 110°F on discharges that contain residual heat. The limit is intended as a safety measure to protect sampling personnel or anyone who may come into contact with the heated discharge where it enters the receiving water.

Pennsylvania regulations at 25 Pa. Code § 92a.48(b) require the imposition of technology-based TRC limits for facilities that use chlorination and that are not already subject to TRC limits based on applicable federal ELGs or a facility-specific BPJ evaluation. BHB Plastic Molding does not use chlorine in any form in the facility, however, the DMRs have reported concentrations that are detectable at 3.8 mg/L. Effluent limitations/monitoring of TRC will be required.

Table 2: Regulatory Effluent Standards and Monitoring Requirements for Outfall 001

Parameter	Monthly Average	Daily Maximum	IMAX	Units
Flow	Monitor and Report		XXX	MGD
Temperature	XXX	XXX	110	°F
Total Residual Chlorine (TRC)	0.5	XXX	1.6	mg/L
pH	Not less than 6.0 nor greater than 9.0			S.U.

Water Quality Based Effluent Limits

Toxic Pollutants Water Quality Analysis

The discharges from Outfall 001 are non-contact cooling water and are non-process discharges, therefore a toxic pollutant water quality analysis was not conducted for the discharge from Outfall 001.

Thermal WQBELs for Heated Discharges

Thermal WQBELs are evaluated using DEP's "Thermal Discharge Limit Calculation Spreadsheet" created with Microsoft Excel for Windows. The program calculates temperature WLAs through the application of a heat transfer equation, which takes two forms in the program depending on the source of the facility's cooling water. In Case 1, intake water to a facility is from the receiving stream. In Case 2, intake water is from a source other than the receiving stream (e.g., municipal water supply). The determination of which case applies to a given discharge is determined by the input data which include the receiving stream flow rate (Q_{7-10} or the minimum regulated flow for large rivers), the stream intake flow rate, external source intake flow rates, consumptive flow rates and site-specific ambient stream temperatures. Case 1 limits are generally expressed as heat rejection rates while Case 2 limits are usually expressed as temperatures.

Since the temperature criteria from 25 Pa. Code Chapter 93.7(a) are expressed on monthly and semi-monthly bases for three different aquatic life-uses—cold water fishes, warm water fishes and trout stocking—the program generates monthly and semi-monthly limits for each use. DEP selects the output that corresponds to the aquatic life-use of the receiving stream and consequently which limits apply to the discharge. Temperature WLAs are bounded by an upper limit of 110°F for the safety of sampling personnel and anyone who may come into contact with the heated discharge where it enters the receiving water. If no WLAs below 110°F are calculated, an instantaneous maximum limit of 110°F is recommended by the program.

Discharges from Outfall 001 are classified under Case 2 because water is obtained via municipal water supply. The results of the thermal analysis, included in Attachment B, indicate that no WQBELs for temperature are required at outfall 001. Therefore, the 110°F daily maximum temperature limit will be imposed at outfall 001.

Threatened and Endangered Mussel Species Concerns and Considerations

French Creek is known to contain state and federally listed threatened and endangered mussel species. Due to the discharge being to French Creek, potential impacts to endangered mussel species were evaluated.

The USFWS has indicated in comment letters on other NPDES permits that in order to protect threatened and endangered mussel species, wastewater discharges containing ammonia-nitrogen (NH_3-N), chloride (Cl^-), nickel, zinc, and copper where mussels or their habitat exist, can be no more than 1.9 mg/l, 78 mg/l, 7.3 µg/l, 13.18 µg/l, and 10 µg/l respectively.

Chloride and Nickel levels have been reported at maximum concentrations of 45.0 mg/L and 0.010 mg/L, respectively. Given the identification of ammonia-nitrogen (NH3-N), Copper, and Zinc as additional pollutants of concern, monitoring requirements for these parameters are proposed. Considering the discharge isn't directly into French Creek but rather into a dry swale, annual reporting is proposed for Chloride, Nickel, and the newly added parameters.

Total Residual Chlorine

To determine if WQBELs are required for discharges containing total residual chlorine (TRC), a discharge evaluation is performed using a DEP program called TRC_CALC created with Microsoft Excel for Windows. TRC_CALC calculates TRC Waste Load Allocations (WLAs) through the application of a mass balance model which considers TRC losses due to stream and discharge chlorine demands and first-order chlorine decay. Input values for the program include flow rates and chlorine demands for the receiving stream and the discharge, the number of samples taken per month, coefficients of TRC variability, partial mix factors, and an optional factor of safety. The mass balance model calculates WLAs for acute and chronic criteria that are then converted to long term averages using calculated multipliers. The multipliers are functions of the number of samples taken per month and the TRC variability coefficients (normally kept at default values unless site specific information is available). The most stringent limitation between the acute and chronic long-term averages is converted to an average monthly limit for comparison to the BAT average monthly limit of 0.5 mg/l from 25 Pa. Code § 92a.48(b)(2). The more stringent of these average monthly TRC limitations is imposed in the permit. The results of the modeling, included in Attachment C, indicate that no WQBELs are required for TRC.

Anti-Backsliding

The previous permit limitations are displayed below in Table 3 and can be used pursuant to EPA's anti-backsliding regulation, 40 CFR 122.44(l).

Table 3: Current Effluent Limitations for Outfall 001

Parameter	Instant. Minimum	Monthly Average	Daily Maximum	Instant. Maximum	Monitor Frequency	Sample type
Flow (MGD)	XXX	Report	XXX	XXX	1/month	Estimate
pH (S.U.)	6.0	XXX	9.0	XXX	2/month	Grab
Total Residual Chloride (mg/L)	XXX	0.5	XXX	1.2	2/month	Grab
Nickel Total (mg/L)	XXX	XXX	Report	XXX	1/6 months	Grab
Chloride (mg/L)	XXX	XXX	Report	XXX	1/6 months	Grab

Final Effluent Limitations for Outfall 001

The effluent limitations and monitoring frequencies for Outfall 001 are displayed below in Table 4**.** The daily maximum reporting requirement for pH has been replaced with an instantaneous maximum reporting requirement to be consistent with current permitting practices.

Table 4. Effluent Limits and Monitoring Requirements for Outfall 006

Parameter	Instant. Minimum	Monthly Average	Daily Maximum	Instant. Maximum	Monitor Frequency	Sample type
Flow (MGD)	XXX	Report	XXX	XXX	1/month	Estimate
pH (S.U.)	6.0	XXX	XXX	9.0	2/month	Grab
Total Residual Chloride (mg/L)	XXX	0.5	XXX	1.2	2/month	Grab
Temperature (°F)	XXX	XXX	XXX	110	2/month	I-S
Nickel Total (mg/L)	XXX	XXX	Report	XXX	1/year	Grab
Chloride (mg/L)	XXX	XXX	Report	XXX	1/year	Grab
Copper, Total (mg/L)	XXX	XXX	Report	XXX	1/year	Grab
Zinc, Total	XXX	XXX	Report	XXX	1/year	Grab
Ammonia-Nitrogen (mg/L)	XXX	XXX	Report	XXX	1/year	Grab

Tools and References Used to Develop Permit	
☐	WQM for Windows Model (see Attachment)
☐	Toxics Management Spreadsheet (see Attachment)
☒	TRC Model Spreadsheet (see Attachment **C**)
☒	Temperature Model Spreadsheet (see Attachment **B**)
☐	Water Quality Toxics Management Strategy, 361-0100-003, 4/06.
☐	Technical Guidance for the Development and Specification of Effluent Limitations, 386-0400-001, 10/97.
☐	Policy for Permitting Surface Water Diversions, 386-2000-019, 3/98.
☐	Policy for Conducting Technical Reviews of Minor NPDES Renewal Applications, 386-2000-018, 11/96.
☐	Technology-Based Control Requirements for Water Treatment Plant Wastes, 386-2183-001, 10/97.
☐	Technical Guidance for Development of NPDES Permit Requirements Steam Electric Industry, 386-2183-002, 12/97.
☐	Pennsylvania CSO Policy, 386-2000-002, 9/08.
☐	Water Quality Antidegradation Implementation Guidance, 391-0300-002, 11/03.
☐	Implementation Guidance Evaluation & Process Thermal Discharge (316(a)) Federal Water Pollution Act, 386-2000-008, 4/97.
☐	Determining Water Quality-Based Effluent Limits, 386-2000-004, 12/97.
☐	Implementation Guidance Design Conditions, 386-2000-007, 9/97.
☐	Technical Reference Guide (TRG) WQM 7.0 for Windows, Wasteload Allocation Program for Dissolved Oxygen and Ammonia Nitrogen, Version 1.0, 386-2000-016, 6/2004.
☐	Interim Method for the Sampling and Analysis of Osmotic Pressure on Streams, Brines, and Industrial Discharges, 386-2000-012, 10/1997.
☐	Implementation Guidance for Section 95.6 Management of Point Source Phosphorus Discharges to Lakes, Ponds, and Impoundments, 386-2000-009, 3/99.
☐	Technical Reference Guide (TRG) PENTOXSD for Windows, PA Single Discharge Wasteload Allocation Program for Toxics, Version 2.0, 386-2000-015, 5/2004.
☐	Implementation Guidance for Section 93.7 Ammonia Criteria, 386-2000-022, 11/97.
☐	Policy and Procedure for Evaluating Wastewater Discharges to Intermittent and Ephemeral Streams, Drainage Channels and Swales, and Storm Sewers, 386-2000-013, 4/2008.
☐	Implementation Guidance Total Residual Chlorine (TRC) Regulation, 386-2000-011, 11/1994.
☐	Implementation Guidance for Temperature Criteria, 386-2000-001, 4/09.
☐	Implementation Guidance for Section 95.9 Phosphorus Discharges to Free Flowing Streams, 386-2000-021, 10/97.
☐	Implementation Guidance for Application of Section 93.5(e) for Potable Water Supply Protection Total Dissolved Solids, Nitrite-Nitrate, Non-Priority Pollutant Phenolics and Fluorides, 386-2000-020, 10/97.
☐	Field Data Collection and Evaluation Protocol for Determining Stream and Point Source Discharge Design Hardness, 386-2000-005, 3/99.
☐	Implementation Guidance for the Determination and Use of Background/Ambient Water Quality in the Determination of Wasteload Allocations and NPDES Effluent Limitations for Toxic Substances, 386-2000-010, 3/1999.
☐	Design Stream Flows, 386-2000-003, 9/98.
☐	Field Data Collection and Evaluation Protocol for Deriving Daily and Hourly Discharge Coefficients of Variation (CV) and Other Discharge Characteristics, 386-2000-006, 10/98.
☐	Evaluations of Phosphorus Discharges to Lakes, Ponds and Impoundments, 386-3200-001, 6/97.
☐	Pennsylvania's Chesapeake Bay Tributary Strategy Implementation Plan for NPDES Permitting, 4/07.
☐	SOP:
☐	Other:

ATTACHMENT A
StreamStats Report

PA0101273 - Outfall 001 - StreamStats Report

Region ID: PA
Workspace ID: PA20250813125912508000
Clicked Point (Latitude, Longitude): 41.80547, -80.05894
Time: 2025-08-13 08:59:53 -0400

Collapse All

Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
CARBON	Percentage of area of carbonate rock	0	percent
DRNAREA	Area that drains to a point on a stream	513	square miles
ELEV	Mean Basin Elevation	1447	feet
FOREST	Percentage of area covered by forest	53.8434	percent
PRECIP	Mean Annual Precipitation	46	inches
URBAN	Percentage of basin with urban development	1.1075	percent

Low-Flow Statistics

Low-Flow Statistics Parameters [Low Flow Region 3]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	513	square miles	2.33	1720
ELEV	Mean Basin Elevation	1447	feet	898	2700
PRECIP	Mean Annual Precipitation	46	inches	38.7	47.9

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

PIL: Lower 90% Prediction Interval, PIU: Upper 90% Prediction Interval, ASEp: Average Standard Error of Prediction, SE: Standard Error, PC: Percent Correct, RMSE: Root Mean Squared Error, PseudoR^2: Pseudo R Squared (other -- see report)

Statistic	Value	Unit	SE	ASEp
7 Day 2 Year Low Flow	64.9	ft^3/s	43	43
30 Day 2 Year Low Flow	88.6	ft^3/s	38	38
7 Day 10 Year Low Flow	38.6	ft^3/s	54	54
30 Day 10 Year Low Flow	49.3	ft^3/s	49	49
90 Day 10 Year Low Flow	68.2	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/)

Base Flow Statistics

Base Flow Statistics Parameters [Statewide Mean and Base Flow]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
CARBON	Percent Carbonate	0	percent	0	99
DRNAREA	Drainage Area	513	square miles	2.26	1720
FOREST	Percent Forest	53.8434	percent	5.1	100
PRECIP	Mean Annual Precipitation	46	inches	33.1	50.4
URBAN	Percent Urban	1.1075	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, PC: Percent Correct, RMSE: Root Mean Squared Error, PseudoR^2: Pseudo R Squared (other -- see report)

Statistic	Value	Unit	SE	ASEp
Base Flow 10 Year Recurrence Interval	319	ft^3/s	21	21
Base Flow 25 Year Recurrence Interval	282	ft^3/s	21	21
Base Flow 50 Year Recurrence Interval	261	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/)

ATTACHMENT B
Temperature Modeling Results for Outfall 001

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Instructions | *Inputs*

Facility: **BHL Plastic Molding**

Permit No.: **PA0101273**

Stream Name: **French Creek**

Analyst/Engineer: **Angela Rohrer**

Stream Q7-10 (cfs)*: **38.6**

Outfall No.: **001**

Analysis Type*: **WWF**

Facility Flows

Semi-Monthly Increment	Intake (Stream) (MGD)*	Intake (External) (MGD)*	Consumptive Loss (MGD)*	Discharge Flow (MGD)
Jan 1-31	0	0.0075		0.0075
Feb 1-29	0	0.0075		0.0075
Mar 1-31	0	0.0075		0.0075
Apr 1-15	0	0.0075		0.0075
Apr 16-30	0	0.0075		0.0075
May 1-15	0	0.0075		0.0075
May 16-31	0	0.0075		0.0075
Jun 1-15	0	0.0075		0.0075
Jun 16-30	0	0.0075		0.0075
Jul 1-31	0	0.0075		0.0075
Aug 1-15	0	0.0075		0.0075
Aug 16-31	0	0.0075		0.0075
Sep 1-15	0	0.0075		0.0075
Sep 16-30	0	0.0075		0.0075
Oct 1-15	0	0.0075		0.0075
Oct 16-31	0	0.0075		0.0075
Nov 1-15	0	0.0075		0.0075
Nov 16-30	0	0.0075		0.0075
Dec 1-31	0	0.0075		0.0075

Stream Flows

Q7-10 Multipliers (Default Shown)	PMF	Seasonal Stream Flow (cfs)	Downstream Stream Flow (cfs)
3.2	1.00	123.52	123.53
3.5	1.00	135.10	135.11
7	1.00	270.20	270.21
9.3	1.00	358.98	358.99
9.3	1.00	358.98	358.99
5.1	1.00	196.86	196.87
5.1	1.00	196.86	196.87
3	1.00	115.80	115.81
3	1.00	115.80	115.81
1.7	1.00	65.62	65.63
1.4	1.00	54.04	54.05
1.4	1.00	54.04	54.05
1.1	1.00	42.46	42.47
1.1	1.00	42.46	42.47
1.2	1.00	46.32	46.33
1.2	1.00	46.32	46.33
1.6	1.00	61.76	61.77
1.6	1.00	61.76	61.77
2.4	1.00	92.64	92.65

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Thermal Limits Spreadsheet
Version 1.0, April 2024

Instructions | Inputs | *Reference*

Semi-Monthly Increment	WWF Criteria (°F)	CWF Criteria (°F)	TSF Criteria (°F)
Jan 1-31	40	38	40
Feb 1-29	40	38	40
Mar 1-31	46	42	46
Apr 1-15	52	48	52
Apr 16-30	58	52	58
May 1-15	64	54	64
May 16-31	72	58	68
Jun 1-15	80	60	70
Jun 16-30	84	64	72
Jul 1-31	87	66	74
Aug 1-15	87	66	80
Aug 16-31	87	66	87
Sep 1-15	84	64	84
Sep 16-30	78	60	78
Oct 1-15	72	54	72
Oct 16-31	66	50	66
Nov 1-15	58	46	58
Nov 16-30	50	42	50
Dec 1-31	42	40	42

Q7-10 Multipliers (Default Values)
3.2
3.5
7
9.3
9.3
5.1
5.1
3
3
1.7
1.4
1.4
1.1
1.1
1.2
1.2
1.6
1.6
2.4

Default Ambient Stream Temperature (°F)		
WWF	CWF	TSF
35	34	34
35	35	35
40	39	39
47	46	46
53	52	52
58	55	56
62	59	60
67	63	65
71	67	69
75	71	73
74	70	72
74	70	70
71	66	68
65	60	62
60	55	57
54	51	53
48	46	47
42	40	41
37	35	36

NOTES:
WWF= Warm water fishes
CWF= Cold water fishes
TSF= Trout stocking
Default PMF = 1

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Thermal Limits Spreadsheet
Version 1.0, April 2024

Instructions | *WWF Results*

Recommended Limits for Case 1 or Case 2

Semi-Monthly Increment	**WWF** Target Maximum Stream Temp. (°F)	**Case 1** Daily WLA (Million BTUs/day)	**Case 2** Daily WLA (°F)
Jan 1-31	40	N/A -- Case 2	110.0
Feb 1-29	40	N/A -- Case 2	110.0
Mar 1-31	46	N/A -- Case 2	110.0
Apr 1-15	52	N/A -- Case 2	110.0
Apr 16-30	58	N/A -- Case 2	110.0
May 1-15	64	N/A -- Case 2	110.0
May 16-31	72	N/A -- Case 2	110.0
Jun 1-15	80	N/A -- Case 2	110.0
Jun 16-30	84	N/A -- Case 2	110.0
Jul 1-31	87	N/A -- Case 2	110.0
Aug 1-15	87	N/A -- Case 2	110.0
Aug 16-31	87	N/A -- Case 2	110.0
Sep 1-15	84	N/A -- Case 2	110.0
Sep 16-30	78	N/A -- Case 2	110.0
Oct 1-15	72	N/A -- Case 2	110.0
Oct 16-31	66	N/A -- Case 2	110.0
Nov 1-15	58	N/A -- Case 2	110.0
Nov 16-30	50	N/A -- Case 2	110.0
Dec 1-31	42	N/A -- Case 2	110.0

ATTACHMENT C
TRC Modeling Results for Outfall 001

TRC EVALUATION - Outfall 001

39	= Q stream (cfs)	0.5	= CV Daily
0.0075	= Q discharge (MGD)	0.5	= CV Hourly
4	= no. samples	0.301	= AFC_Partial Mix Factor
0.3	= Chlorine Demand of Stream	1	= CFC_Partial Mix Factor
0	= Chlorine Demand of Discharge	15	= AFC_Criteria Compliance Time (min)
0.5	= BAT/BPJ Value	720	= CFC_Criteria Compliance Time (min)
	= % Factor of Safety (FOS)		=Decay Coefficient (K)

Source	Reference	AFC Calculations		Reference	CFC Calculations	
TRC	1.3.2.iii	WLA afc =	319.462	1.3.2.iii	WLA cfc =	1034.667
PENTOXSD TRG	5.1a	LTAMULT afc =	0.373	5.1c	LTAMULT cfc =	0.581
PENTOXSD TRG	5.1b	LTA_afc=	119.039	5.1d	LTA_cfc =	601.507

Source		Effluent Limit Calculations		
PENTOXSD TRG	5.1f	AML MULT =	1.720	
PENTOXSD TRG	5.1g	AVG MON LIMIT (mg/l) =	0.500	BAT/BPJ
		INST MAX LIMIT (mg/l) =	1.170	

WLA afc	**(.019/e(-k*AFC_tc)) + [(AFC_Yc*Qs*.019/Qd*e(-k*AFC_tc))...**
	...+ Xd + (AFC_Yc*Qs*Xs/Qd)]*(1-FOS/100)
LTAMULT afc	EXP((0.5*LN(cvh^2+1))-2.326*LN(cvh^2+1)^0.5)
LTA_afc	wla_afc*LTAMULT_afc
WLA_cfc	**(.011/e(-k*CFC_tc) + [(CFC_Yc*Qs*.011/Qd*e(-k*CFC_tc))...**
	...+ Xd + (CFC_Yc*Qs*Xs/Qd)]*(1-FOS/100)
LTAMULT_cfc	EXP((0.5*LN(cvd^2/no_samples+1))-2.326*LN(cvd^2/no_samples+1)^0.5)
LTA_cfc	wla_cfc*LTAMULT_cfc
AML MULT	EXP(2.326*LN((cvd^2/no_samples+1)^0.5)-0.5*LN(cvd^2/no_samples+1))
AVG MON LIMIT	MIN(BAT_BPJ,MIN(LTA_afc,LTA_cfc)*AML_MULT)
INST MAX LIMIT	**1.5*((av_mon_limit/AML_MULT)/LTAMULT_afc)**