pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Southwest Regional Office
CLEAN WATER PROGRAM

NPDES PERMIT FACT SHEET
INDIVIDUAL SEWAGE

Application Type	**Renewal**	Application No.	**PA0216208**
Facility Type	**Non-Municipal**	APS ID	**1033698**
Major / Minor	**Minor**	Authorization ID	**1345560**

Applicant and Facility Information

Applicant Name	**John F. Kotun**	Facility Name	**Superior Mobile Home Park STP**
Applicant Address	319 Anderson Hozak Road	Facility Address	Superior Lane
	Clinton, PA 15026-1303		Aliquippa, PA 15001
Applicant Contact	John Kotun	Facility Contact	***same as applicant***
Applicant Phone	(724) 899-3201	Facility Phone	***same as applicant***
Client ID	43752	Site ID	238031
Ch 94 Load Status	Not Overloaded	Municipality	Raccoon Township
Connection Status		County	Beaver
Date Application Received	March 8, 2021	EPA Waived?	Yes
Date Application Accepted		If No, Reason	

Purpose of Application: NPDES permit renewal for treated sewage discharges from a non-municipal sewage treatment plant.

Summary of Review

On March 8, 2021, DEP received an application from Mr. John F. Kotun to renew the NPDES permit for discharges from the Superior Mobile Home Park STP (Superior MHP STP). The permit currently in effect was issued on December 29, 2016 with a January 1, 2017 effective date and a December 31, 2021 expiration date. The renewal application was received at least 180 days before the permit expired (i.e., by July 4, 2021), so the terms and conditions of the 2017 permit were automatically continued and remain in effect.

Changes for this permit renewal include 1) an increase of the dissolved oxygen limit from 3.0 mg/L minimum monthly average to an instantaneous minimum of 6.0 mg/L; 2) an increase in the minimum measurement frequency for TRC from 3/week to 1/day; and 3) the addition of a 1/year monitoring requirement for *E. Coli*.

Sludge use and disposal description and location(s): no solids disposed in at least the last five years.

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.

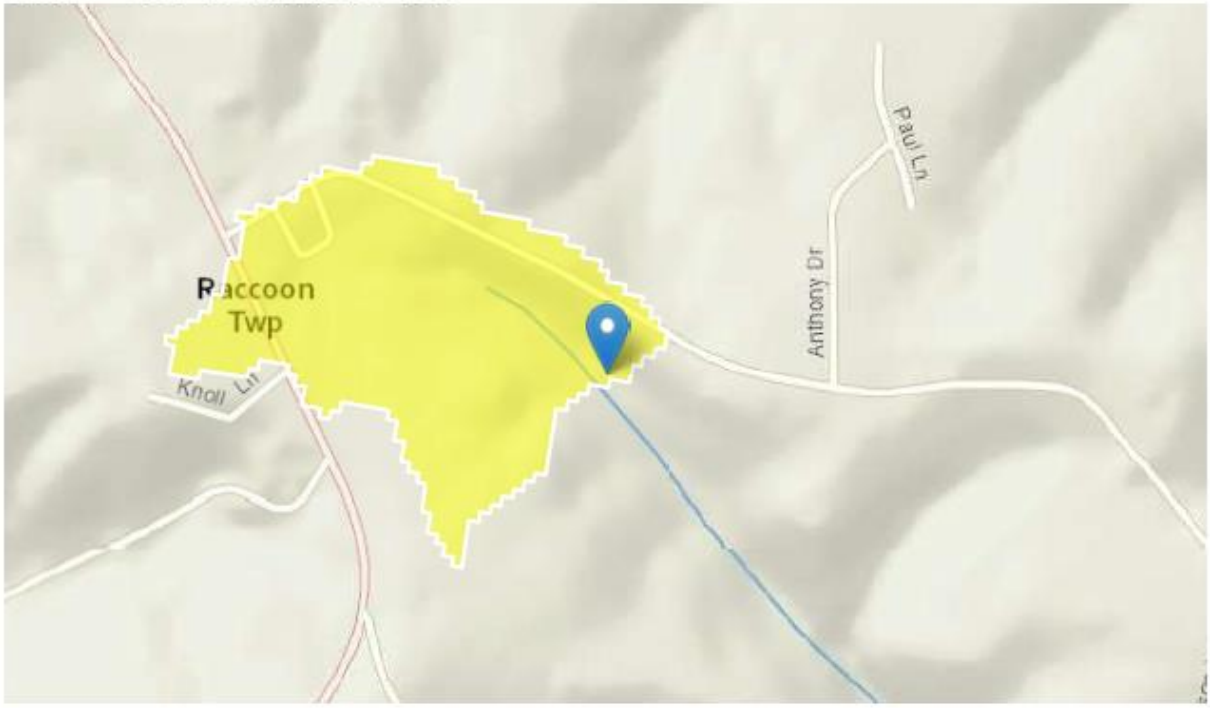
Approve	Deny	Signatures	Date
X		*Ryan C. Decker* Ryan C. Decker, P.E. / Environmental Engineer	August 5, 2021
X		*Christopher Kriley* Christopher Kriley, P.E. / Program Manager	August 6, 2021

Discharge, Receiving Waters and Water Supply Information			
Outfall No.	001	Design Flow (MGD)	0.0025
Latitude	40° 35' 45.0"	Longitude	-80° 23' 37.0"
Quad Name	Hookstown	Quad Code	1402
Wastewater Description:	Treated sewage		
Receiving Waters	Unnamed Tributary to Service Creek (HQ-CWF)	Stream Code	33610
NHD Com ID	99682254	RMI	1.74
Drainage Area	0.0409	Yield (cfs/mi^2)	0.00386
Q_{7-10} Flow (cfs)	0.000158	Q_{7-10} Basis	USGS StreamStats
Elevation (ft)	1,148	Slope (ft/ft)	0.026
Watershed No.	20-D	Chapter 93 Class.	HQ-CWF
Existing Use		Existing Use Qualifier	
Exceptions to Use		Exceptions to Criteria	
Assessment Status	Attaining Use(s)		
Cause(s) of Impairment			
Source(s) of Impairment			
TMDL Status	Final	Name	Raccoon Creek Watershed
Nearest Downstream Public Water Supply Intake	Ambridge Water Authority (PWS ID 5040008)		
PWS Waters	Service Creek/Ambridge Reservoir	Flow at Intake (cfs)	
PWS RMI	2.97	Distance from Outfall (mi)	3.13

Changes Since Last Permit Issuance: None

StreamStats Report

Region ID: PA
Workspace ID: PA20210714213842336000
Clicked Point (Latitude, Longitude): 40.59476, -80.38999
Time: 2021-07-14 17:38:57 -0400



Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	0.0409	square miles
ELEV	Mean Basin Elevation	1180	feet

Low-Flow Statistics Parameters [Low Flow Region 4]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.0409	square miles	2.26	1400

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
ELEV	Mean Basin Elevation	1180	feet	1050	2580

Low-Flow Statistics Disclaimers [Low Flow Region 4]

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

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

Statistic	Value	Unit
7 Day 2 Year Low Flow	0.000726	ft^3/s
30 Day 2 Year Low Flow	0.00162	ft^3/s
7 Day 10 Year Low Flow	0.000158	ft^3/s
30 Day 10 Year Low Flow	0.000429	ft^3/s
90 Day 10 Year Low Flow	0.00102	ft^3/s

Low-Flow Statistics Citations

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

Application Version: 4.6.0
StreamStats Services Version: 1.2.22
NSS Services Version: 2.1.2

Treatment Facility Summary		
Treatment Facility: Superior Mobile Home Park STP		
WQM Permit No.	**Issuance Date**	**Purpose**
367S027	June 2, 1971	Permit issued to Mr. Wesley R. Campbell for a 0.0025 MGD sewage treatment plant consisting of septic tank, pressure-dosed intermittent sand filters, a chlorine contact tank, and tablet chlorinator
367S027 T-1	June 16, 1994	Permit transferred from Mr. Wesley R. Campbell to Mr. John F. Kotun
367S027 T-2	October 23, 1996	Permit transferred from Mr. John F. Kotun to Mr. Wesley R. Campbell following repossession from the former
367S027 T-3	January 20, 2000	Permit transferred from Mr. Wesley R. Campbell to Mr. John F. Kotun

Waste Type	Degree of Treatment	Process Type	Disinfection	Avg Annual Flow (MGD)
Sewage	Tertiary	Septic Tank/Sand Filter	Chlorine Tablets	0.0025

Hydraulic Capacity (MGD)	Organic Capacity (lbs/day)	Load Status	Biosolids Treatment	Biosolids Use/Disposal
0.0025	7.8	Not Overloaded	N/A	N/A

Changes Since Last Permit Issuance: None

Other Comments: None

Compliance History

DMR Data for Outfall 001 (from May 1, 2020 to April 30, 2021)

Parameter	APR-21	MAR-21	FEB-21	JAN-21	DEC-20	NOV-20	OCT-20	SEP-20	AUG-20	JUL-20	JUN-20	MAY-20
Flow (MGD) Average Monthly	0.002349	0.002349	0.002349	0.002349	0.002349	0.002349	0.002349	0.002349	0.002349	0.002349	0.002349	0.002349
pH (S.U.) Minimum	6.6	6.6	6.6	6.6	6.9	6.8	6.8	6.8	7.2	6.8	7.2	6.8
pH (S.U.) Maximum	7.6	7.4	7.8	8.0	7.8	7.6	7.3	7.4	8.0	7.8	8.0	7.3
DO (mg/L) Minimum Monthly Average	8.4	8.9	7.0	9.0	9.8	8.4	8.4	8.3	8.2	7.8	7.4	8.2
TRC (mg/L) Average Monthly	0.3	0.3	0.4	0.2	0.2	0.06	0.2	0.2	0.2	0.3	0.3	0.25
TRC (mg/L) Instantaneous Maximum	1.6	0.84	1.3	0.3	0.4	0.3	0.3	0.6	0.3	0.4	0.3	0.7
CBOD5 (mg/L) Average Monthly	< 4	6.45	< 4.0	< 4.0	< 4.0	< 4.0	13.1	4.2	4.2	< 4.0	< 4.0	< 4.0
CBOD5 (mg/L) Instantaneous Maximum	< 4	8.9	< 4.0	< 4.0	< 4.0	< 4.0	21.7	4.3	4.2	< 4.0	< 4.0	< 4.0
TSS (mg/L) Average Monthly	< 5	< 5.0	< 5.0	< 5.0	< 5	< 5.0	< 5.0	5.5	< 5.0	< 5.0	< 5.0	< 5.0
TSS (mg/L) Instantaneous Maximum	< 5	< 5.0	< 5.0	< 5.0	< 5	< 5.0	< 5.0	6	< 5.0	< 5.0	< 5.0	< 5.0
Fecal Coliform (CFU/100 ml) Geometric Mean	< 1	1	< 1	< 1	< 4.0	< 1	< 1	3.5	< 1	5	11.3	< 1
Fecal Coliform (CFU/100 ml) Instantaneous Maximum	< 1	1	< 1	< 1	< 4.0	< 1	< 1	6	< 1	30	128	< 1
Total Nitrogen (mg/L) Daily Maximum					26.72							
Ammonia (mg/L) Average Monthly	< 0.30	0.52	0.5	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30
Ammonia (mg/L) Instantaneous Maximum	< 0.30	0.74	0.7	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30
Total Phosphorus (mg/L) Daily Maximum					1.19							

Compliance History

Effluent Violations for Outfall 001, from: June 1, 2020 To: April 30, 2021

Parameter	Date	SBC	DMR Value	Units	Limit Value	Units
CBOD5	10/31/20	Avg Mo	13.1	mg/L	10	mg/L
CBOD5	10/31/20	IMAX	21.7	mg/L	20	mg/L

Summary of Inspections:

Other Comments:

Development of Effluent Limitations

Outfall No. 001 **Design Flow (MGD)** 0.0025
Latitude 40° 35' 45.0" **Longitude** -80° 23' 37.0"
Wastewater Description: Sewage effluent

Technology-Based Effluent Limitations (TBELs)

25 Pa. Code § 92a.47 – Sewage Permits

Regulations at 25 Pa. Code § 92a.47 specify TBELs and effluent standards that apply to sewage discharges. Section 92a.47(a) requires that sewage be given a minimum of secondary treatment with significant biological treatment that achieves the following:

Table 1. Regulatory TBELs for Sanitary Wastewaters

Parameter	Average Monthly (mg/L)	Weekly Average (mg/L)	Instant. Max (mg/L)	Basis
CBOD5	25	40	50†	25 Pa. Code § 92a.47(a)(1), (a)(2) & 40 CFR § 133.102(a)(4)(i)
Total Suspended Solids	30	45	60†	25 Pa. Code § 92a.47(a)(1), (a)(2) & 40 CFR § 133.102(b)(1)
Fecal Coliform (No./100 mL) May 1 – September 30	200 (Geometric Mean)	N/A	1,000	25 Pa. Code § 92a.47(a)(4)
Fecal Coliform (No./100 mL) October 1 – April 30	2,000 (Geometric Mean)	N/A	10,000	25 Pa. Code § 92a.47(a)(5)
Total Residual Chlorine	0.5 (or facility-specific)	N/A	1.6 (or facility-specific)	25 Pa. Code § 92a.47(a)(8) & § 92a.48(b)(2)
pH (s.u.)	not less than 6.0 and not greater than 9.0			25 Pa. Code § 92a.47(a)(7) & § 95.2(1), & 40 CFR § 133.102(c)

†Value is calculated as two times the monthly average in accordance with Chapter 2 of DEP's "Technical Guidance for the Development and Specification of Effluent Limitations and Other Permit Conditions in NPDES Permits" [Doc. No. 362-0400-001].

The $CBOD_5$, TSS, and pH limits are the same as those in EPA's secondary treatment regulation (40 CFR § 133.102).

Additional TBELs

Outfall 001 discharges to a drainage swale that leads to a stream designated for high-quality cold-water fishes (HQ-CWF). Two DEP policies are consulted for this discharge situation: 1) the "Water Quality Antidegradation Implementation Guidance" (Doc. No. 391-0300-002; November 29, 2003); and 2) the "Policy and Procedure for Evaluating Wastewater Discharges to Intermittent and Ephemeral Streams, Drainage Channels and Swales, and Storm Sewers" (Doc. No. 391-2000-014; April 12, 2008).

Antidegradation

DEP explained in previous permit documents for this site that the discharge was permitted and commenced before the receiving stream (downstream of the swale) was designated as a high-quality stream. Water Quality Management Permit No. 367S027 was issued on June 2, 1971 and DEP files indicate the plant was operable on December 21, 1971. The date of the high-quality stream designation was in 1979.

According to DEP's Water Quality Antidegradation Implementation Guidance (p.46):

> Discharges in existence prior to the HQ or EV designation are "grandfathered" and considered to be part of the existing quality of the waterbody. "Grandfathered" flows are not subject to "the non-discharge alternatives/use of best technologies analysis" or SEJ (for HQ waters) in acknowledgment of the resources invested by municipal officials in planning for community sewage needs…[a]ll nonpoint source contributions and non-grandfathered point sources that occur after a waterbody is designated HQ or EV are subject to applicable provisions of the Antidegradation Program.

Pursuant to DEP's antidegradation guidance, discharges from the Superior MHP STP are grandfathered into the receiving stream's designated aquatic life use of High-Quality Cold-Water Fishes (HQ-CWF), so no antidegradation analysis is required. New, additional, and increased discharges are subject to antidegradation requirements, but the Superior MHP STP has not reported any changes to its discharge (e.g., increased design flow or loading) that trigger an evaluation of those requirements.

Discharges to Drainage Swales

DEP's "Policy and Procedure for Evaluating Wastewater Discharges to Intermittent and Ephemeral Streams, Drainage Channels and Swales, and Storm Sewers" (Doc. No. 391-2000-014, April 12, 2008) states the following:

> Advanced Treatment Requirements. For discharges to intermittent and ephemeral streams, drainage channels and swales, and storm sewers, a high degree of treatment is required to compensate for the lack of available assimilative capacity and to minimize the potential for nuisance conditions. Effluent limits will be determined by the regional permit engineer on a case-by-case basis, but for discharges of treated sewage and similar oxygen-consuming wastes, effluent limits should include and be at least as stringent as these, or equivalent:
>
> CBOD5 - 10 mg/L as a monthly average;
> TSS - 10 mg/L as a monthly average;
> Total N - 5 mg/L as a monthly average;
> Dissolved oxygen - minimum 6 mg/L at all times;
> Phosphorus – 0.5 mg/L as a monthly average.
>
> All discharges of treated sewage require effective disinfection sufficient to meet Chapter 93 bacteria criteria at the point of discharge. Seasonal adjustments should not be applied to effluent limits based on the advanced treatment requirements contained in this guidance. As an additional requirement for discharges of treated sewage, sand filters or equivalent are required in all cases. The Department will determine if alternative proposed treatment technologies are at least equivalent to sand filters.
>
> SFTFs are exempt from the advanced treatment requirements listed in this guidance. However, the technology-based treatment requirements contained in the Small Flow Treatment Facilities Manual, DEP-ID 362-0300-002, are fully applicable for SFTFs.

Minimum treatment standards for bacteria are given by 92a.47(a)(4) and (a)(5) as shown in Table 1.

Small Flow Treatment Facilities (SFTFs) are sewage treatment plants with design flows of 2,000 gpd or less. The design flow of the Superior MHP STP is 2,500 gpd, so the facility is not exempt based on the requirements of the guidance. However, Section I.C.3 of DEP's "Standard Operating Procedure (SOP) for Clean Water Program Establishing Effluent Limitations for Individual Sewage Permits" (SOP No. BCW-PMT-033, Version 1.9, March 22, 2021) states the following for discharges with a stream flow-to-wastewater flow ($Q_{7\text{-}10}$-to-design flow) ratio of less than 3:1:

> For existing discharges, if the more stringent treatment requirements cannot be achieved, do not apply the standards in DEP guidance (391-2000-014) unless the receiving stream is impaired and the point source discharge contributes to the impairment. If this is the case, apply the more stringent treatment requirements and provide a schedule to meet final limitations not exceeding three years in the draft permit.

The stream flow-to-wastewater flow ratio for Outfall 001 is 0.000158 cfs / 0.00387 cfs = 0.04:1 (i.e., less than 3:1).

Effluent data from the STP are summarized in the table below for the parameters that could be subject to Advanced Treatment Requirements if those requirements can be achieved by the existing STP.

Parameter	No. of Samples	Average Effluent Conc. (mg/L)	Maximum Effluent Conc. (mg/L)	Advanced Treatment Requirement (mg/L)
CBOD5	52	5.5	13.1	10.0
TSS	52	5.6	25	10.0
Dissolved Oxygen	53	7.8	5.6 (Minimum)	6.0
Total Nitrogen	4	17.2	29.8	5.0
Total Phosphorus	4	0.99	1.56	0.5

The STP is already subject to the Advanced Treatment Requirements for CBOD5 and TSS including 10.0 mg/L average monthly limits and 20.0 mg/L instantaneous maximum limits calculated using an average monthly limit multiplier of 2.0 in

accordance with Chapter 2 of DEP's "Technical Guidance for the Development and Specification of Effluent Limitations and Other Permit Conditions in NPDES Permits" [Doc. No. 362-0400-001]. Those limits must be maintained pursuant to EPA's antibacksliding regulation (40 CFR § 122.44), which requires effluent limits in reissued permits be at least as stringent as the final effluent limits in the previous permit (subject to certain exceptions that do not apply here). Mr. Kotun has only reported one average monthly and one daily maximum effluent violation for CBOD5 and TSS since January of 2017.

Outfall 001 is currently subject to a minimum monthly average dissolved oxygen limit of 3.0 mg/L, but effluent data show that the STP can achieve the 6.0 mg/L minimum, so that limit will be imposed in the renewed permit.

The limited effluent data for Total Nitrogen and Total Phosphorus show that the advanced treatment requirements for those parameters cannot be achieved. However, nitrogen will be controlled to some extent by effluent limits on ammonia-nitrogen. Additionally, the receiving stream, an unnamed tributary to Service Creek, is currently attaining its designated HQ-CWF use. Since the stream is not impaired by nitrogen or phosphorus, the advanced treatment requirements for those parameters will not be imposed.

Other Requirements

An annual monitoring requirement for *E. Coli* will be imposed at Outfall 001 pursuant to 25 Pa. Code § 92a.61(b). *E. Coli* was recently added to the bacteria criteria in 25 Pa. Code Chapter 93 and the monitoring will be used to determine if *E. Coli* concentrations require additional controls.

Applicable TBELs

Table 2. TBELs for Outfall 001

Parameter	Average Monthly (mg/L)	Instant. Max (mg/L)	Basis
CBOD5	10.0	20.0†	25 Pa. Code § 92a.3(b)(4); 40 CFR § 125.3(d); & DEP Doc. 391-2000-014
Total Suspended Solids	10.0	20.0†	25 Pa. Code § 92a.3(b)(4); 40 CFR § 125.3(d); & DEP Doc. 391-2000-014
E.Coli (No./100 mL)	—	Report (Daily Maximum)	25 Pa. Code § 92a.61(b)
Fecal Coliform (No./100 mL) May 1 – September 30	200 (Geometric Mean)	1,000	25 Pa. Code § 92a.47(a)(4); DEP Doc. 391-2000-014
Fecal Coliform (No./100 mL) October 1 – April 30	2,000 (Geometric Mean)	10,000	25 Pa. Code § 92a.47(a)(5); DEP Doc. 391-2000-014
Total Residual Chlorine	0.5	1.6	25 Pa. Code § 92a.47(a)(8) & § 92a.48(b)(2)
Dissolved Oxygen	6.0 (Minimum)	—	25 Pa. Code § 92a.3(b)(4); 40 CFR § 125.3(d); & DEP Doc. 391-2000-014
Nitrogen, Total	—	Report (Daily Maximum)	25 Pa. Code § 92a.61(b)
Phosphorus, Total	—	Report (Daily Maximum)	25 Pa. Code § 92a.61(b)
pH (s.u.)	not less than 6.0 and not greater than 9.0		25 Pa. Code § 92a.47(a)(7) & § 95.2(1), & 40 CFR § 133.102(c)

†Value is calculated as two times the monthly average in accordance with Chapter 2 of DEP's "Technical Guidance for the Development and Specification of Effluent Limitations and Other Permit Conditions in NPDES Permits" [Doc. No. 362-0400-001].

Water Quality-Based Effluent Limitations (WQBELs)

Pursuant to EPA's approval of Pennsylvania's 2017 Triennial Review of Water Quality Standards and corresponding regulatory changes published in the *Pennsylvania Bulletin* on July 11, 2020, new water quality criteria for ammonia-nitrogen apply to waters of the Commonwealth. Therefore, WQBELs for Outfall 001 are re-evaluated even though there have been no changes to the STP.

In accordance with DEP's "Policy and Procedure for Evaluating Wastewater Discharges to Intermittent and Ephemeral Streams, Drainage Channels and Swales, and Storm Sewers", WQBELs are evaluated at the point of first surface water use. As established with previous permits, the point of first surface water use is the headwaters of an unnamed tributary to

Service Creek with Stream Code 33610 (UNT 33610), which is designated for high-quality cold-water fishes (HQ-CWF). The approximate river mile of the headwaters is 1.63, but the discharge is about 0.09 miles upstream at RMI 1.74.

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 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 dissolved oxygen module, the model simulates the mixing and consumption of dissolved oxygen in the stream due to the degradation of CBOD5 and ammonia-nitrogen, and compares calculated instream dissolved oxygen concentrations to dissolved oxygen 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.

Water Quality Modeling with WQM 7.0

Table 4. Reach 2 WQM 7.0 Inputs

Discharge Characteristics	
Parameter	**Value**
River Mile Index	1.63
Discharge Flow (MGD)	0.0025
Discharge Temp. (°C) (Warm)	20.0
Discharge Temp. (°C) (Cold)	15.0
Basin/Stream Characteristics	
Parameter	**Value**
Area in Square Miles	0.04
Q_{7-10} (cfs)	0.000158
Low-flow yield (cfs/mi^2)	0.00386
Elevation (ft)	1148
Slope	0.026
Stream Temp. (°C) (Summer)	20.0
Stream Temp. (°C) (Winter)	5.0
Stream pH (s.u.)	7.0
D.O. Goal (mg/L) (HQ-CWF)	6.0

DEP's modeling for sewage discharges is a 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, November 4, 1997] (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 6.5 s.u., respectively, based on the recommendations for free stone cold water streams in DEP's Ammonia Guidance (the unnamed tributary to Service Creek is designated for cold water fishes). The flow used for modeling is the average design flow (0.0025 MGD). Except for dissolved oxygen, the input discharge concentrations are the average monthly limits from the previous permit (10 mg/L for CBOD5 and 2.0 mg/L for ammonia-nitrogen). The input discharge concentration for dissolved oxygen is the 6.0 mg/L minimum limit (see Table 2). The width to depth ratio is assumed to be ten according to DEP policy.

The results of the modeling at the input discharge concentrations indicate that new, more stringent WQBELs for CBOD5 and Ammonia-Nitrogen are not required because the input concentrations are returned as the recommended limits. However, by adjusting the input concentration for ammonia-nitrogen to a default input concentration of 25 mg/L the model is forced to report ammonia-nitrogen WQBELs if they are more stringent than 25 mg/L. Using that revised input discharge concentration, WQM 7.0 recommends WQBELs of 2.02 mg/L average monthly and 4.04 mg/L maximum. After rounding, those limits are the same as the current summer period ammonia-nitrogen limits.

As a check, winter period modeling also is conducted. For winter period modeling, the low-flow yield (0.00386 cfs/mi^2 representing Q_{7-10} flow) is doubled to 0.00772 cfs/mi^2 consistent with DEP's Ammonia Guidance. Default stream and discharge temperatures of 5°C and 15°C, respectively, are assumed—also based on the Ammonia Guidance. The input discharge concentration for ammonia-nitrogen is the winter period limit from the previous permit (3.2 mg/L). The model calculates ammonia-nitrogen WQBELs for the winter period of 3.17 mg/L average monthly and 6.34 mg/L maximum. Those limits are comparable to the current winter period ammonia-nitrogen limits. Therefore, the existing ammonia-nitrogen limits will control in the reissued permit.

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.

Based on TRC discharge evaluation, the TRC limits that apply at Outfall 001 are TBELs (0.5 mg/L average monthly and 1.6 mg/L instantaneous maximum). The IMAX limit is not consistent with DEP's policy for calculating IMAX limits from average monthly limits using a multiplier of 2.0 as described in Chapter 2, Section C of DEP's "Technical Guidance for the Development and Specification of Effluent Limitations and Other Permit Conditions in NPDES Permits" [Doc. No. 362-0400-001]. However, TRC_CALC recommends an IMAX limit of 1.6 mg/L and no water quality impacts have been noted in the receiving stream at that level.

Effluent Limit and Monitoring Requirements

In accordance with 25 Pa. Code §§ 92a.12 and 92a.61, effluent limits applicable at Outfall 001 are the more stringent of TBELs, WQBELs, regulatory effluent standards, and monitoring requirements as summarized in the table on the following page.

Monitoring frequencies and sample types are established pursuant to DEP's "Technical Guidance for the Development and Specification of Effluent Limitations. and Other Permit Conditions in NPDES Permits" and DEP's "Standard Operating Procedure for Clean Water Program Establishing Effluent Limitations for Individual Sewage Permits". Dissolved oxygen, TRC, and pH must be sampled 1/day using grab sampling. CBOD5, TSS, and ammonia-nitrogen must be sampled 2/month using grab sampling. Fecal coliform must be sampled 2/month using grab sampling. *E.Coli* must be sampled 1/year using grab sampling. Total nitrogen and total phosphorus must be sampled 1/year using grab sampling. Flow must be measured 1/week.

The permittee previously filed an appeal of the final permit issued on July 20, 2016. In the appeal, the permittee, Mr. John F. Kotun, objected to 1/day sampling for TRC and pH. To resolve the appeal, DEP amended the permit to require TRC and pH sampling 3/week. When the appeal was resolved, DEP wrote in its Fact Sheet Addendum that Mr. Kotun would be informed that the next permit renewal in the year 2021 may contain 1/day sampling for TRC, pH and D.O. It is unknown if Mr. Kotun was informed as such, but DEP is including 1/day sampling for TRC, pH and D.O. In doing so, DEP notes that it is not aware of any exceptional circumstances at the Superior MHP STP that warrant continued deviation from daily sampling frequencies for TRC, D.O., and pH. Schools, campgrounds, other mobile home parks, and other sites operating small-flow sewage treatment plants are required to conduct daily sampling for those parameters. Those facilities can comply with daily sampling, so it is reasonable to expect that Mr. Kotun can comply with daily sampling. Additionally, the facility has a history of operation and maintenance issues, which warrants greater scrutiny of the STP.

Proposed Effluent Limitations and Monitoring Requirements

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

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

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly	Average Weekly	Instant. Minimum	Average Monthly	Daily Maximum	Instant. Maximum		
Flow (MGD)	0.0025	XXX	XXX	XXX	XXX	XXX	1/week	Measured
pH (S.U.)	XXX	XXX	6.0	XXX	XXX	9.0	1/day	Grab
Dissolved Oxygen	XXX	XXX	6.0	XXX	XXX	XXX	1/day	Grab
Total Residual Chlorine (TRC)	XXX	XXX	XXX	0.5	XXX	1.6	1/day	Grab
CBOD5	XXX	XXX	XXX	10.0	XXX	20.0	2/month	Grab
Total Suspended Solids (TSS)	XXX	XXX	XXX	10.0	XXX	20.0	2/month	Grab
Fecal Coliform (No./100 ml) Oct 1 - Apr 30	XXX	XXX	XXX	2000 Geo Mean	XXX	10000	2/month	Grab
Fecal Coliform (No./100 ml) May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	XXX	1000	2/month	Grab
E. Coli (No./100 ml)	XXX	XXX	XXX	XXX	Report	XXX	1/year	Grab
Total Nitrogen	XXX	XXX	XXX	XXX	Report	XXX	1/year	Grab
Ammonia-Nitrogen Nov 1 - Apr 30	XXX	XXX	XXX	3.2	XXX	6.4	2/month	Grab
Ammonia-Nitrogen May 1 - Oct 31	XXX	XXX	XXX	2.0	XXX	4.0	2/month	Grab
Total Phosphorus	XXX	XXX	XXX	XXX	Report	XXX	1/year	Grab

Compliance Sampling Location: at Outfall 001

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

ATTACHMENT A

WQM 7.0 Modeling Results

Summer Modeling

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
20D	33610	Trib 33610 to Service Creek	1.630	1148.00	0.04	0.02600	0.00	☑

Stream Data

Design Cond.	LFY (cfsm)	Trib Flow (cfs)	Stream Flow (cfs)	Rch Trav Time (days)	Rch Velocity (fps)	WD Ratio	Rch Width (ft)	Rch Depth (ft)	Tributary Temp (°C)	Tributary pH	Stream Temp (°C)	Stream pH
Q7-10	0.004	0.00	0.00	0.000	0.000	10.0	0.00	0.00	20.00	6.50	0.00	0.00
Q1-10		0.00	0.00	0.000	0.000							
Q30-10		0.00	0.00	0.000	0.000							

Discharge Data

Name	Permit Number	Existing Disc Flow (mgd)	Permitted Disc Flow (mgd)	Design Disc Flow (mgd)	Reserve Factor	Disc Temp (°C)	Disc pH
Outfall 001	PA0216208-1	0.0025	0.0000	0.0000	0.000	20.00	7.00

Parameter Data

Parameter Name	Disc Conc (mg/L)	Trib Conc (mg/L)	Stream Conc (mg/L)	Fate Coef (1/days)
CBOD5	10.00	2.00	0.00	1.50
Dissolved Oxygen	6.00	9.17	0.00	0.00
NH3-N	25.00	0.00	0.00	0.70

Summer Modeling

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
20D	33610	Trib 33610 to Service Creek	0.630	975.00	0.41	0.02600	0.00	☑

Stream Data

Design Cond.	LFY (cfsm)	Trib Flow (cfs)	Stream Flow (cfs)	Rch Trav Time (days)	Rch Velocity (fps)	WD Ratio	Rch Width (ft)	Rch Depth (ft)	Tributary Temp (°C)	Tributary pH	Stream Temp (°C)	Stream pH
Q7-10	0.004	0.00	0.00	0.000	0.000	10.0	0.00	0.00	20.00	6.50	0.00	0.00
Q1-10		0.00	0.00	0.000	0.000							
Q30-10		0.00	0.00	0.000	0.000							

Discharge Data

Name	Permit Number	Existing Disc Flow (mgd)	Permitted Disc Flow (mgd)	Design Disc Flow (mgd)	Reserve Factor	Disc Temp (°C)	Disc pH
		0.0000	0.0000	0.0000	0.000	0.00	7.00

Parameter Data

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

Summer Modeling

WQM 7.0 Modeling Specifications

Parameters	Both	Use Inputted Q1-10 and Q30-10 Flows	☑
WLA Method	EMPR	Use Inputted W/D Ratio	☑
Q1-10/Q7-10 Ratio	0.64	Use Inputted Reach Travel Times	☑
Q30-10/Q7-10 Ratio	1.36	Temperature Adjust Kr	☐
D.O. Saturation	90.00%	Use Balanced Technology	☑
D.O. Goal	6		

Summer Modeling

WQM 7.0 Hydrodynamic Outputs

SWP Basin	Stream Code	Stream Name
20D	33610	Trib 33610 to Service Creek

RMI	Stream Flow (cfs)	PWS With (cfs)	Net Stream Flow (cfs)	Disc Analysis Flow (cfs)	Reach Slope (ft/ft)	Depth (ft)	Width (ft)	W/D Ratio	Velocity (fps)	Reach Trav Time (days)	Analysis Temp (°C)	Analysis pH
Q7-10 Flow												
1.630	0.00	0.00	0.00	.0039	0.02600	.134	1.34	10	0.02	2.743	20.00	6.97
Q1-10 Flow												
1.630	0.00	0.00	0.00	.0039	0.02600	NA	NA	NA	0.02	2.765	20.00	6.98
Q30-10 Flow												
1.630	0.00	0.00	0.00	.0039	0.02600	NA	NA	NA	0.02	2.722	20.00	6.95

Summer Modeling

WQM 7.0 Wasteload Allocations

SWP Basin	Stream Code	Stream Name
20D	33610	Trib 33610 to Service Creek

NH3-N Acute Allocations

RMI	Discharge Name	Baseline Criterion (mg/L)	Baseline WLA (mg/L)	Multiple Criterion (mg/L)	Multiple WLA (mg/L)	Critical Reach	Percent Reduction
1.630	Outfall 001	17.09	17.53	17.09	17.53	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
1.630	Outfall 001	1.92	2.02	1.92	2.02	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)		
1.63	Outfall 001	10	10	2.02	2.02	6	6	0	0

Summer Modeling

WQM 7.0 D.O.Simulation

SWP Basin	Stream Code	Stream Name
20D	33610	Trib 33610 to Service Creek

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
1.630	0.002	20.000	6.965
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
1.344	0.134	10.000	0.022
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
9.69	0.575	1.95	0.700
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
6.122	69.537	Owens	6
Reach Travel Time (days)			
2.743			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.274	8.28	1.61	8.24
0.549	7.07	1.32	8.24
0.823	6.04	1.09	8.24
1.097	5.16	0.90	8.24
1.372	4.40	0.74	8.24
1.646	3.76	0.61	8.24
1.920	3.21	0.51	8.24
2.195	2.74	0.42	8.24
2.469	2.34	0.35	8.24
2.743	2.00	0.29	8.24

Summer Modeling

WQM 7.0 Effluent Limits

SWP Basin	Stream Code	Stream Name
20D	33610	Trib 33610 to Service Creek

RMI	Name	Permit Number	Disc Flow (mgd)	Parameter	Effl. Limit 30-day Ave. (mg/L)	Effl. Limit Maximum (mg/L)	Effl. Limit Minimum (mg/L)
1.630	Outfall 001	PA0216208-1	0.002	CBOD5	10		
				NH3-N	2.02	4.04	
				Dissolved Oxygen			6

Winter Modeling

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
20D	33610	Trib 33610 to Service Creek	1.630	1148.00	0.04	0.02600	0.00	☑

Stream Data

Design Cond.	LFY (cfsm)	Trib Flow (cfs)	Stream Flow (cfs)	Rch Trav Time (days)	Rch Velocity (fps)	WD Ratio	Rch Width (ft)	Rch Depth (ft)	Tributary Temp (°C)	Tributary pH	Stream Temp (°C)	Stream pH
Q7-10	0.008	0.00	0.00	0.000	0.000	10.0	0.00	0.00	5.00	6.50	0.00	0.00
Q1-10		0.00	0.00	0.000	0.000							
Q30-10		0.00	0.00	0.000	0.000							

Discharge Data

Name	Permit Number	Existing Disc Flow (mgd)	Permitted Disc Flow (mgd)	Design Disc Flow (mgd)	Reserve Factor	Disc Temp (°C)	Disc pH
Outfall 001	PA0216208-1	0.0025	0.0000	0.0000	0.000	15.00	7.00

Parameter Data

Parameter Name	Disc Conc (mg/L)	Trib Conc (mg/L)	Stream Conc (mg/L)	Fate Coef (1/days)
CBOD5	10.00	2.00	0.00	1.50
Dissolved Oxygen	6.00	12.80	0.00	0.00
NH3-N	25.00	0.00	0.00	0.70

Winter Modeling

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
20D	33610	Trib 33610 to Service Creek	0.630	975.00	0.41	0.02600	0.00	☑

Stream Data

Design Cond.	LFY (cfsm)	Trib Flow (cfs)	Stream Flow (cfs)	Rch Trav Time (days)	Rch Velocity (fps)	WD Ratio	Rch Width (ft)	Rch Depth (ft)	Tributary Temp (°C)	Tributary pH	Stream Temp (°C)	Stream pH
Q7-10	0.008	0.00	0.00	0.000	0.000	10.0	0.00	0.00	5.00	6.50	0.00	0.00
Q1-10		0.00	0.00	0.000	0.000							
Q30-10		0.00	0.00	0.000	0.000							

Discharge Data

Name	Permit Number	Existing Disc Flow (mgd)	Permitted Disc Flow (mgd)	Design Disc Flow (mgd)	Reserve Factor	Disc Temp (°C)	Disc pH
		0.0000	0.0000	0.0000	0.000	0.00	7.00

Parameter Data

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

Winter Modeling

WQM 7.0 Modeling Specifications

Parameters	Both	Use Inputted Q1-10 and Q30-10 Flows	☑
WLA Method	EMPR	Use Inputted W/D Ratio	☑
Q1-10/Q7-10 Ratio	0.64	Use Inputted Reach Travel Times	☑
Q30-10/Q7-10 Ratio	1.36	Temperature Adjust Kr	☐
D.O. Saturation	90.00%	Use Balanced Technology	☑
D.O. Goal	6		

Winter Modeling

WQM 7.0 Hydrodynamic Outputs

SWP Basin	Stream Code	Stream Name
20D	33610	Trib 33610 to Service Creek

RMI	Stream Flow (cfs)	PWS With (cfs)	Net Stream Flow (cfs)	Disc Analysis Flow (cfs)	Reach Slope (ft/ft)	Depth (ft)	Width (ft)	W/D Ratio	Velocity (fps)	Reach Trav Time (days)	Analysis Temp (°C)	Analysis pH
Q7-10 Flow												
1.630	0.00	0.00	0.00	.0039	0.02600	.135	1.35	10	0.02	2.686	14.26	6.94
Q1-10 Flow												
1.630	0.00	0.00	0.00	.0039	0.02600	NA	NA	NA	0.02	2.727	14.51	6.96
Q30-10 Flow												
1.630	0.00	0.00	0.00	.0039	0.02600	NA	NA	NA	0.02	2.647	14.02	6.92

Winter Modeling

WQM 7.0 Wasteload Allocations

SWP Basin	Stream Code	Stream Name
20D	33610	Trib 33610 to Service Creek

NH3-N Acute Allocations

RMI	Discharge Name	Baseline Criterion (mg/L)	Baseline WLA (mg/L)	Multiple Criterion (mg/L)	Multiple WLA (mg/L)	Critical Reach	Percent Reduction
1.630	Outfall 001	25.01	26.29	25.01	26.29	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
1.630	Outfall 001	2.86	3.17	2.86	3.17	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)		
1.63	Outfall 001	10	10	3.17	3.17	6	6	0	0

Winter Modeling

WQM 7.0 D.O.Simulation

SWP Basin	Stream Code	Stream Name
20D	33610	Trib 33610 to Service Creek

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
1.630	0.002	14.261	6.936
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
1.355	0.135	10.000	0.023
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
9.41	0.750	2.93	0.450
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
6.503	69.454	Owens	6
Reach Travel Time (days)			
2.686			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.269	8.06	2.60	9.23
0.537	6.90	2.30	9.23
0.806	5.91	2.04	9.23
1.074	5.06	1.81	9.23
1.343	4.34	1.60	9.23
1.612	3.72	1.42	9.23
1.880	3.18	1.26	9.23
2.149	2.73	1.12	9.23
2.417	2.33	0.99	9.23
2.686	2.00	0.88	9.23

Winter Modeling

WQM 7.0 Effluent Limits

SWP Basin	Stream Code	Stream Name
20D	33610	Trib 33610 to Service Creek

RMI	Name	Permit Number	Disc Flow (mgd)	Parameter	Effl. Limit 30-day Ave. (mg/L)	Effl. Limit Maximum (mg/L)	Effl. Limit Minimum (mg/L)
1.630	Outfall 001	PA0216208-1	0.002	CBOD5	10		
				NH3-N	3.17	6.34	
				Dissolved Oxygen			6

ATTACHMENT B

TRC Modeling Results

TRC EVALUATION – Outfall 001

0.37	**= Q stream (cfs)**	**0.5**	**= CV Daily**
0.012	**= Q discharge (MGD)**	**0.5**	**= CV Hourly**
30	**= no. samples**	**0.776**	**= 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 = 4.953	**1.3.2.iii**	WLA cfc = 6.210
PENTOXSD TRG	**5.1a**	LTAMULT afc = 0.373	**5.1c**	LTAMULT cfc = 0.581
PENTOXSD TRG	**5.1b**	LTA_afc= 1.846	**5.1d**	LTA_cfc = 3.610

Source	Reference	Effluent Limit Calculations		
PENTOXSD TRG	**5.1f**	AML MULT =	1.231	
PENTOXSD TRG	**5.1g**	AVG MON LIMIT (mg/l) =	0.500	BAT/BPJ
		INST MAX LIMIT (mg/l) =	1.635	

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)**