pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Southwest Regional Office
CLEAN WATER PROGRAM

Application Type	**Renewal**	Application No.	**PA0041441**
Facility Type	**Municipal**	APS ID	**836286**
Major / Minor	**Minor**	Authorization ID	**1275524**

NPDES PERMIT FACT SHEET INDIVIDUAL SEWAGE

Applicant and Facility Information

Applicant Name	**Somerset Township Municipal Authority Somerset County**	Facility Name	**Wells Creek STP**
Applicant Address	PO Box 247 Somerset, PA 15501-0247	Facility Address	356 Coleman Station Road Friedens, PA 15541-8205
Applicant Contact	Carolyn Zambanini; zamc@comcast.net	Facility Contact	***same as applicant***
Applicant Phone	(814) 445-5842	Facility Phone	***same as applicant***
Client ID	25312	Site ID	238899
Ch 94 Load Status	Not Overloaded	Municipality	Somerset Township
Connection Status		County	Somerset
Date Application Received	June 3, 2019	EPA Waived?	Yes
Date Application Accepted	June 5, 2019	If No, Reason	

Purpose of Application: NPDES permit renewal for treated sewage discharges from a POTW.

Summary of Review

On June 3, 2019, the Somerset Township Municipal Authority (STMA) submitted an application to renew the NPDES permit for STMA's Wells Creek Sewage Treatment Plant (Wells Creek STP). The permit currently in effect was issued on November 24, 2014 with a December 1, 2014 effective date and a November 30, 2019 expiration date. The renewal application was received 180 days before the permit expired, so the terms and conditions of the 2014 permit were automatically continued and remain in effect.

The treatment process at the Wells Creek STP was described by STMA in the permit renewal application as follows:

> Influent is collected to the Wells Creek Wastewater Sewage Treatment Plant control building wet well. One of three pumps transfer the wastewater through a flow meter to the Influent Control Structure comminutor and normally onward into Lagoon No. 1 as a manageable liquid. Lagoon No. 1 is separated in two by a baffle to provide extended retention time and permit differing levels of aeration before the wastewater decants through Control Structure No. 1 and a diversion box into Lagoon No. 2. Lagoon No. 2 provides additional biological treatment before decanting through Control Structure No. 2 and into Lagoon No. 3. Control Structure No. 2 contains a Poly-Aluminum Chloride Compound (PAC) injection system to precipitation phosphorus out into Lagoon No. 3. Lagoon No. 3 decants through Control Structure No. 3, the Control Manhole, and into the Bio-Tower Pump Station Wet Well. Wastewater in the wet well receives Sodium Bi-Carbonate by injection to raise alkalinity before being pumped into, or recirculated through the Bio-Towers No. 1 and/or No. 2. The processed wastewater then flows through Control Structure No. 4 and into the Chlorine Contact Tank. Effluent released from the Chlorine Contact Tank is then automatically measured for flow, residual chlorine, and pH level before release through Outfall 001 and into Wells Creek.

Approve	Deny	Signatures	Date
X		*Ryan C. Decker* Ryan C. Decker, P.E. / Environmental Engineer	April 30, 2021
X		*Donald Leone* Donald J. Leone, P.E. / Environmental Engineer Manager	May 3, 2021
X		*Christopher Kriley* Christopher Kriley, P.E. / Program Manager	May 3, 2021

Summary of Review

Each part of the treatment plant, prior to reaching the Chlorine Contact Tank, is interconnected by by-pass and recycle lines to provide isolation for maintenance or continued treatment back to any separate structure. The Lagoon Recycle Line from Lagoon No. 3 back to the Control Building Wet Well is integrated with an elevated 500-gallon dump tank to allow hauled-in wastes to be accepted with the normal influent.

Wells Creek's designated aquatic life use is impaired by nutrients from agriculture. A nutrient Total Maximum Daily Load (TMDL) was finalized for Wells Creek in December 2006 to address the nutrient impairment of the stream. In addition, Wells Creek is part of the Kiskiminetas-Conemaugh River Watershed, which has a final TMDL from January 2010. Outfall 001 from Wells Creek was assigned waste load allocations in both TMDLs, but only the Wells Creek TMDL's waste load allocations have been imposed in the NPDES permit to date.

The renewed permit includes the following changes:

- New, more stringent seasonal water quality-based effluent limits for ammonia-nitrogen and CBOD-5 resulting from updated water quality modeling to implement recent revisions to ammonia-nitrogen water quality criteria in 25 Pa. Code Chapter 93 (promulgated in October 2020 and approved by U.S. EPA in March 2021).
- New, more stringent water quality-based effluent limits for Total Residual Chlorine based on updated stream and discharge chlorine demands consistent with DEP's permitting policies. A two-year compliance schedule is provided for the new TRC limits.
- New water quality-based effluent limits for aluminum, iron, and manganese imposed pursuant to the Total Maximum Daily Load for Streams Impaired by Acid Mine Drainage in the Kiskiminetas-Conemaugh River Watershed.
- A new quarterly monitoring requirement for *E.Coli* resulting from revised Chapter 93 water quality criteria and updated DEP permitting policies.
- Removal of weekly average limits for ammonia-nitrogen and total phosphorus consistent with DEP's permitting policies.

Sludge use and disposal description and location(s): No sludge was removed from the facility in the previous year.

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)	0.8
Latitude	40° 3' 11.58"	Longitude	-78° 58' 11.93"
Quad Name	Stoystown	Quad Code	1814
Wastewater Description:	Sewage effluent		
Receiving Waters	Wells Creek (CWF)	Stream Code	45675
NHD Com ID	123723739	River Mile Index (RMI)	2.57
Drainage Area	13.9	Yield (cfs/mi^2)	0.0643
Q_{7-10} Flow (cfs)	0.894	Q_{7-10} Basis	USGS StreamStats
Elevation (ft)	2,009	Slope (ft/ft)	0.0022
Watershed No.	18-E	Chapter 93 Class.	CWF
Existing Use		Existing Use Qualifier	
Exceptions to Use		Exceptions to Criteria	
Assessment Status	Impaired		
Cause(s) of Impairment	Metals; Nutrients		
Source(s) of Impairment	Acid mine drainage; agriculture		
TMDL Status	Final (January 29, 2010); Final (December 2006)	Name	Kiskiminetas-Conemaugh River Watersheds TMDL; Wells Creek
Nearest Downstream Public Water Supply Intake	Hooversville Municipal Authority		
PWS Waters	Stonycreek River	Flow at Intake (cfs)	
PWS RMI	24.9	Distance from Outfall (mi)	9.22 (river miles)

Changes Since Last Permit Issuance: No changes

Other Comments: RMI for Outfall 001 updated from 2.27 to 2.57 (there was no physical change to the outfall location, just an updated RMI measurement).

StreamStats Report

Region ID: PA
Workspace ID: PA20210305192706255000
Clicked Point (Latitude, Longitude): 40.05321, -78.97003
Time: 2021-03-05 14:27:23 -0500

Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	13.9	square miles
ELEV	Mean Basin Elevation	2250	feet
PRECIP	Mean Annual Precipitation	43	inches

Low-Flow Statistics Parameters[100 Percent (13.9 square miles) Low Flow Region 3]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	13.9	square miles	2.33	1720
ELEV	Mean Basin Elevation	2250	feet	898	2700
PRECIP	Mean Annual Precipitation	43	inches	38.7	47.9

Low-Flow Statistics Flow Report[100 Percent (13.9 square miles) Low Flow Region 3]

PII: Prediction Interval-Lower, Plu: Prediction Interval-Upper, SEp: Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	SE	SEp
7 Day 2 Year Low Flow	1.95	ft^3/s	43	43
30 Day 2 Year Low Flow	2.69	ft^3/s	38	38
7 Day 10 Year Low Flow	0.894	ft^3/s	54	54
30 Day 10 Year Low Flow	1.16	ft^3/s	49	49
90 Day 10 Year Low Flow	1.7	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/)

Application Version: 4.4.0

Treatment Facility Summary
Treatment Facility: Wells Creek Sewage Treatment Plant – The STP consists of a comminutor, a bar screen, three continuously aerated lagoons (Lagoon #1 has two cells, A and B, separated by a baffle), a wet well, two bio-towers, and an aerated chlorine contact tank with baffles.

WQM Permit No.	Issuance Date	Purpose
5672408	April 28, 1972	Permit issued to Somerset Township Municipal Authority for a 0.305 MGD sewage treatment plant consisting of grit channels, a comminutor, two partial mix aerated lagoons (Lagoon No. 1 with a capacity of 5.6 million gallons and Lagoon No. 2 with a capacity of 3.5 million gallons), chlorination, and an outfall sewer .
5672408 A-1	April 25, 1995	Permit issued to Somerset Township Municipal Authority for upgrades to and expansion of the STP. The average design flow was increased to 0.8 MGD (peak 2.0 MGD). Upgrades included a new influent pump station; new grit channels, comminutor, and bar screen; a new partial mix aerated lagoon (in addition to the two existing lagoons) with a capacity of 4.2 million gallons with a synthetic liner, helixor static tube aerators, and an underdrain groundwater monitoring system; a new bio-tower pump station; two new 25-ft diameter bio-towers; a new chlorine contact tank; three new air blowers at 1,000 scfm; new chemical feed systems for alkalinity control. The existing effluent flow meter and standby electrical power from the secondary electrical substation were maintained. In addition, the upgrades included the removal of sludge from Lagoon No. 1; the installation of a new synthetic liner in Lagoon No. 2; and new groundwater monitoring wells for Lagoon Nos. 1 and 2.

Waste Type	Degree of Treatment	Process Type	Disinfection	Avg Annual Flow (MGD)
Sewage	Secondary with Phosphorus Reduction	Aerated lagoons	Gas Chlorine	0.662

Hydraulic Capacity (MGD)	Organic Capacity (lbs/day)	Load Status	Biosolids Treatment	Biosolids Use/Disposal
0.8	1,360	Not Overloaded	No solids disposed in previous year	

Changes Since Last Permit Issuance: None

Compliance History

DMR Data for Outfall 001 (from February 1, 2020 to January 31, 2021)

Parameter	JAN-21	DEC-20	NOV-20	OCT-20	SEP-20	AUG-20	JUL-20	JUN-20	MAY-20	APR-20	MAR-20	FEB-20
Flow (MGD) Average Monthly	0.507	0.468	0.391	0.237	0.338	0.272	0.243	0.248	0.509	0.797	0.708	0.732
Flow (MGD) Daily Maximum	1.224	1.148	0.794	0.779	0.680	0.929	0.530	0.547	1.000	1.319	1.454	1.465
pH (S.U.) Minimum	6.3	6.8	6.7	6.6	7.1	7.6	6.3	6.3	6.1	6.3	6.4	6.7
pH (S.U.) Maximum	8.0	7.7	7.8	7.4	7.7	8.1	7.1	7.4	7.4	7.8	7.6	7.6
DO (mg/L) Minimum	6.2	6.2	6.4	6.7	7.1	6.9	6.2	6.6	6.5	5.5	6.4	6.4
TRC (mg/L) Average Monthly	0.19	0.15	0.08	0.18	0.16	0.10	0.10	0.12	0.10	0.12	0.14	0.18
TRC (mg/L) Instantaneous Maximum	0.55	0.35	0.41	0.47	0.48	0.42	0.30	0.37	0.34	0.27	0.26	0.35
CBOD5 (lbs/day) Average Monthly	15	19	7	3	6	6	8	9	11	40	18	33
CBOD5 (lbs/day) Weekly Average	45	46	12	5	10	8	12	28	19	66	35	68
CBOD5 (mg/L) Average Monthly	3	4	2	2	2	4	5	4	3	5	4	4
CBOD5 (mg/L) Weekly Average	5	6	3	3	2	4	8	8	4	9	5	6
TSS (lbs/day) Average Monthly	28	36	30	5	20	26	25	16	40	137	39	44
TSS (lbs/day) Weekly Average	89	77	58	7	66	36	47	21	57	154	71	91
TSS (mg/L) Average Monthly	5	8	9	4	6	14	12	9	11	18	8	6
TSS (mg/L) Weekly Average	10	10	10	4	13	24	16	12	12	23	10	8
Fecal Coliform (CFU/100 ml) Geometric Mean	4	40	23	1	3	13	3	5	6	48	21	96
Fecal Coliform (CFU/100 ml) Instantaneous Maximum	201	2481	192	2	18	47	4	36	13	636	355	2481

Total Nitrogen (mg/L) Daily Maximum		22.5										
Ammonia (lbs/day) Average Monthly	22	51	59	11	4	1	10	26	11	35	28	39
Ammonia (lbs/day) Weekly Average	54	69	154	16	14	2	15	89	17	58	54	93
Ammonia (mg/L) Average Monthly	4.9	11.7	14.9	7.5	1.7	0.3	4.5	8.9	2.6	4.3	5.6	4.9
Ammonia (mg/L) Weekly Average	7.7	15.1	26.4	10.3	6.5	1.0	6.6	25.2	3.5	5.9	7.6	8.1
Total Phosphorus (lbs/day) Average Monthly	4.1	9.5	16.1	5.1	4.3	2.1	3.9	2.5	3.0	10.3	6.9	7.6
Total Phosphorus (lbs/day) Weekly Average	12	15	33	6	9	3	7	5	4	15	12	14
Total Phosphorus (mg/L) Average Monthly	0.7	2.2	4.6	3.4	1.4	1.2	1.8	1.2	0.8	1.3	1.4	1.0
Total Phosphorus (mg/L) Weekly Average	1.3	4.1	5.6	3.8	1.9	1.8	2.3	1.5	1.0	1.6	1.7	1.2

Compliance History

Effluent Violations for Outfall 001, from: March 1, 2020 To: January 31, 2021

Parameter	Date	SBC	DMR Value	Units	Limit Value	Units
Ammonia	06/30/20	Wkly Avg	89	lbs/day	45	lbs/day
Ammonia	11/30/20	Wkly Avg	154	lbs/day	134	lbs/day
Ammonia	11/30/20	Avg Mo	14.9	mg/L	13.5	mg/L
Ammonia	06/30/20	Avg Mo	8.9	mg/L	4.5	mg/L
Ammonia	10/31/20	Avg Mo	7.5	mg/L	4.5	mg/L
Ammonia	11/30/20	Wkly Avg	26.4	mg/L	20.0	mg/L
Ammonia	10/31/20	Wkly Avg	10.3	mg/L	6.8	mg/L
Ammonia	06/30/20	Wkly Avg	25.2	mg/L	6.8	mg/L
Total Phosphorus	11/30/20	Avg Mo	16.1	lbs/day	13.4	lbs/day
Total Phosphorus	11/30/20	Wkly Avg	33	lbs/day	20	lbs/day
Total Phosphorus	11/30/20	Avg Mo	4.6	mg/L	2.0	mg/L
Total Phosphorus	12/31/20	Avg Mo	2.2	mg/L	2.0	mg/L
Total Phosphorus	10/31/20	Avg Mo	3.4	mg/L	2.0	mg/L
Total Phosphorus	12/31/20	Wkly Avg	4.1	mg/L	3.0	mg/L
Total Phosphorus	10/31/20	Wkly Avg	3.8	mg/L	3.0	mg/L
Total Phosphorus	11/30/20	Wkly Avg	5.6	mg/L	3.0	mg/L

Summary of Inspections:

Other Comments:

Development of Effluent Limitations

Outfall No. 001 **Design Flow (MGD)** 0.8
Latitude 40° 3' 8.00" **Longitude** -78° 58' 11.00"
Wastewater Description: Sewage effluent

The STP consists of a comminutor, bar screen, three continuously aerated lagoons (Lagoon No. 1 with baffles and two cells: Cell A and Cell B), a wet well, two bio-towers, and an aerated and baffled chlorine contact tank.

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	1.00 (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).

Flow must be reported pursuant to 25 Pa. Code § 92a.61(d)(1). The average annual design flow of the STP, 0.8 MGD, will be imposed as the average monthly limit for flow per Table 5-3 of DEP's "Technical Guidance for the Development and Specification of Effluent Limitations. and Other Permit Conditions in NPDES Permits". Also, the existing minimum dissolved oxygen limit of 5.0 mg/L and the annual reporting requirement for Total Nitrogen will be maintained at Outfall 001 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), Total Nitrogen and Total Phosphorus reporting 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), a quarterly reporting requirement for *E.coli* will be added to Outfall 001.

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 following formula with the concentration limits in Table 1 and the Wells Creek STP's 0.8 MGD design flow:

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

Table 2. Mass TBELs for Sanitary Wastewaters

Parameter	Average Monthly (mg/L)	Average Weekly (mg/L)
CBOD5	165.0	265.0
Total Suspended Solids	200.0	300.0

Pursuant to Chapter 5, Section C.2 of DEP's "Technical Guidance for the Development and Specification of Effluent Limitations and Other Permit Conditions in NPDES Permits" mass limits for conventional pollutants with a magnitude greater than 60.0 are rounded down to the nearest 5.0 mg/L (the mass limits in Table 2 account for this rounding convention).

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 are re-evaluated even though there have been no changes to the STP.

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 ("NH3-N"), and dissolved oxygen ("DO") for single and multiple point-source discharge scenarios. To accomplish this, the model simulates two basic processes. In the NH3-N module, the model simulates the mixing and degradation of NH3-N in the stream and compares calculated instream NH3-N concentrations to NH3-N 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 NH3-N, 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.

Water Quality Modeling with WQM 7.0

Table 3. 001 WQM 7.0 Inputs

Discharge Characteristics	
Parameter	**Value**
River Mile Index	2.57
Discharge Flow (MGD)	0.8
Discharge Temp. (°C) (Summer)	20.0
Discharge Temp. (°C) (Winter)	15.0
Basin/Stream Characteristics	
Parameter	**Value**
Area in Square Miles	13.9
Q_{7-10} (cfs)	0.894
Low-flow yield (cfs/mi^2)	0.0643
Elevation (ft)	2,009
Slope	0.0022
Stream Temp. (°C) (Summer)	20.0
Stream Temp. (°C) (Winter)	5.0
Stream pH (s.u.)	6.5

The WQM 7.0 model is run for Outfall 001 to determine whether WQBELs are necessary for $CBOD_5$, ammonia-nitrogen, and/or dissolved oxygen. Input values for the WQM 7.0 model are shown in Table 3.

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 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 6.5 s.u., respectively, based on the recommendations for free stone cold water streams in DEP's Ammonia Guidance (Wells Creek is designated for cold water fishes). The flow used for modeling is the average design flow (0.8 MGD).

The results of the WQM 7.0 modeling (see Attachment A) indicate that new WQBELs are needed for CBOD5 and ammonia-nitrogen. Consistent with Section IV.D of DEP's Ammonia Guidance, limits from WQM 7.0 greater than 10 mg/L are rounded down to the nearest whole number and limits less than 10 mg/L and greater than 1 mg/L are rounded down to the nearest

0.5 mg/L. Limits less than 1 mg/L are around down to the nearest 0.1 mg/L. Limits greater than 60.0 are rounded down to the nearest 5 mg/L.

The average monthly and instantaneous maximum ammonia-nitrogen WQBELs calculated by WQM 7.0 for the summer period are 3.5 mg/L and 7.0 mg/L, respectively (rounded down from 3.52 and 7.04 to the nearest 0.5 mg/L), and the average monthly WQBEL for CBOD5 is 11.0 mg/L (rounded down from 11.7 to the nearest 1.0 mg/L).

Pursuant to Section IV.C.2 of DEP's Ammonia Guidance, average weekly and instantaneous maximum limits for CBOD5 are calculated using average monthly limit multipliers of 1.5 and 2.0, which results in average weekly and instantaneous maximum CBOD5 WQBELs of 16.0 mg/L (rounded down from 16.5 to the nearest 1.0 mg/L) and 22.0 mg/L, respectively.

DEP generally does not impose average weekly limits for ammonia-nitrogen under current policy—only CBOD5 and TSS are subject to average weekly limits. STMA reported intermittent violations of the average weekly ammonia-nitrogen limits with four violations reported in the last twelve months (March 2020 through February 2021). Even though violating an effluent limit generally does not support the elimination of that limit, removing the average weekly ammonia-nitrogen limits, which are based on waste load allocations from WQM 7.0, is consistent with Section 303(d)(4) of the Clean Water Act.[1] Average monthly limits for ammonia-nitrogen will control the average concentrations of ammonia-nitrogen in the STP's effluent and those average monthly limits will be more stringent than those in the current permit. Therefore, the permit will be more protective overall even with average weekly ammonia-nitrogen limits removed. DEP notes that STMA reported average monthly violations on the same DMRs as it reported average weekly violations, so non-compliance over longer durations (represented by 'average' values) still will be reflected in the STP's average monthly results.

DEP mistakenly omitted instantaneous maximum limits for ammonia-nitrogen from the previous permit. Therefore, IMAX limits for ammonia-nitrogen will be imposed in this renewal, but do not need to be reported on DMRs.

Since WQBELs are calculated for the summer period, winter limits also are evaluated. Pursuant to DEP's Ammonia Guidance, WQBELs for the winter period are set by multiplying the summer limits by three, unless modeling indicates that more stringent WQBELs are needed for winter.

For winter period modeling, the low-flow yield (representing $Q_{7\text{-}10}$ flow) is doubled to 0.1286 cfs/mi^2 consistent with DEP's Ammonia Guidance. Default stream and discharge temperatures of 5°C and 15°C, respectively, also are assumed based on the Ammonia Guidance. The results of the modeling (see Attachment A) indicate that winter limits for ammonia-nitrogen (10.0 mg/L and 20.0 mg/L after rounding) calculated using a summer limit multiplier of three are more stringent than the winter modeling results (13.12 mg/L and 26.24 mg/L). Therefore, WQBELs calculated for ammonia-nitrogen using the summer limit multiplier of 3 will apply from November through April. Standard secondary limits are recommended by WQM 7.0 for CBOD5 (see Table 1) during the winter period. The WQBELs are summarized in the table below (after rounding). For comparison, the existing limits also are shown.

Table 4. WQBELs for Outfall 001 versus Existing Limits

Parameter	Permit	Average Monthly (mg/L)	Average Weekly (mg/L)	Instant. Maximum (mg/L)
CBOD5 May 1 – October 31	Old	25.0	40.0	50.0
	New	**11.0** (rounded)	11.0 × 1.5 = **16.0** (rounded)	11.0 × 2.0 = **22.0**
CBOD5 November 1 – April 30	Old	25.0	40.0	50.0
	New	**25.0**	**40.0**	**50.0**
Ammonia-Nitrogen May 1 – October 31	Old	4.5	6.8	N/A
	New	**3.5** (rounded)	N/A	**7.0** (rounded)
Ammonia-Nitrogen November 1 – April 30	Old	13.5	20.0	N/A
	New	3.5 × 3.0 = **10.0** (rounded)	N/A	10.0 × 2 = **20.0**

[1] "Nonattainment water: CWA section 303(d)(4)(A) allows the establishment of a less stringent effluent limitation when the receiving water has been identified as not meeting applicable water quality standards (i.e., a nonattainment water) if the permittee meets two conditions. First, the existing effluent limitation must have been based on a total maximum daily load (TMDL) or other wasteload allocation (WLA) established under CWA section 303. Second, relaxation of the effluent limitation is only allowed if attainment of water quality standards will be ensured or the designated use not being attained is removed in accordance with the water quality standards regulations. This subsection does not provide an exception for establishing less stringent limitations where the original limitation was based on state permitting standards (e.g., state treatment standards) and was not based on a TMDL or WLA."

Mass Limits

Since CBOD5 limits during the summer period are more stringent than the TBELs in Table 1, mass limits for CBOD5 are recalculated. In accordance with Section IV of DEP's "Standard Operating Procedure for Clean Water Program Establishing Effluent Limitations for Individual Sewage Permits", only average monthly mass limits are calculated for ammonia-nitrogen (no average weekly mass limits).

Average monthly and average weekly mass limits (in units of pounds per day) are calculated using the concentration limits in Table 4 and the Wells Creek STP's 0.80 MGD design flow based on the following formula:

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

The calculated mass WQBELs are summarized in Table 5 (after rounding).

Table 5. Mass WQBELs for Sanitary Wastewaters

Parameter	Average Monthly (lb/day)	Average Weekly (lb/day)
CBOD5 May 1 – October 31	70.0 (rounded)	105.0 (rounded)
Ammonia-Nitrogen May 1 – October 31	23.0 (rounded)	—
Ammonia-Nitrogen November 1 – April 30	65.0 (rounded)	—

Nutrient Total Maximum Daily Load for Wells Creek

A section of Wells Creek was identified on the 1996 Section 303(d) list as being impaired by nutrients stemming from agriculture and the Wells Creek STP discharge. In December 2006, DEP finalized a nutrient TMDL for Wells Creek. The TMDL report states the following:

> Pennsylvania's 1996 303(d) list indicates that the nutrient impairment stems from agricultural practices. Field visits conducted from August to December 2006 verified this. Runoff from fertilized cropland appears to be carrying high concentrations of nutrients into the stream. In addition, Wells Creek Sewage Treatment Plant (PA0041441) is currently discharging into this impaired section. Its permitted discharge currently has no limit for nutrients, specifically for phosphorus. As a result of these two sources, periphyton (attached algae) has covered much of the available substrate within the impaired reach. According to Title 25 PA Code Chapter 96.5(c), "When it is determined that the discharge of phosphorus, alone or in combination with the discharge of other pollutants, contributes or threatens to impair existing or designated uses in a free flowing surface water, phosphorus discharges from point source discharges shall be limited to an average monthly concentration of 2 mg/l. More stringent controls on point source discharges may be imposed, or may be otherwise adjusted as a result of a TMDL which has been developed". No other point sources of pollution, including MS4s (municipal separate storm sewer systems) and CSOs (Combined Sewer Overflows) currently exist within the watershed.

Pursuant to 40 CFR § 122.44(d)(1)(vii)(B)[2], WQBELs must be consistent with available waste load allocations (WLAs) from a final TMDL. Therefore, the following phosphorus limitations will be re-imposed in STMA's permit:

Table 6. Phosphorus TMDL WLAs for Outfall 001

Effluent Characteristic	Average Monthly	Instant. Maximum
Concentration (mg/L)	2.0	4.0
Mass (lb/day)	13.4	—

[2] "(vii) When developing water quality-based effluent limits under this paragraph the permitting authority shall ensure that: [cont'd…] (B) Effluent limits developed to protect a narrative water quality criterion, a numeric water quality criterion, or both, are consistent with the assumptions and requirements of any available wasteload allocation for the discharge prepared by the State and approved by EPA pursuant to 40 CFR 130.7."

Instantaneous maximum limits for phosphorus are calculated using the 2.0 average monthly limit multipliers discussed previously in this fact sheet. Mass limits also are calculated for phosphorus using the formula described above. Consistent with DEP's "Standard Operating Procedure for Clean Water Program Establishing Effluent Limitations for Individual Sewage Permits", average weekly limits for total phosphorus are not imposed, so the 3.0 mg/L average weekly limit will be removed from the final permit. The removal of the average weekly limit is consistent with Section 303(d)(4)(A) of the Clean Water Act (regarding limits on effluent limit revisions) because the cumulative effect of the revised TMDL WQBELs for phosphorus still will ensure that water quality standards are attained.

Kiskiminetas-Conemaugh River Watershed TMDL

A TMDL for the Kiskiminetas-Conemaugh River Watershed ("Kiski-Conemaugh TMDL")—of which Wells Creek (via the Stonycreek River) is a part—was completed on January 29, 2010 for the control of acid mine drainage pollutants: aluminum, iron, manganese, sediment and pH. In accordance with 40 CFR § 122.44(d)(1)(vii)(B), when developing WQBELs, the permitting authority shall ensure that effluent limits developed to protect a narrative water quality criterion, a numeric water quality criterion, or both, are consistent with the assumptions and requirements of any available wasteload allocation (WLA) for the discharge prepared by the State and approved by EPA pursuant to 40 CFR § 130.7. The Wells Creek STP was assigned wasteload allocations (WLAs) for aluminum, iron, and manganese by the Kiski-Conemaugh TMDL (see Attachment B). Therefore, pursuant to § 122.44(d)(1)(vii)(B), WQBELs will be imposed at Outfall 001. Only aluminum, iron, and manganese WQBELs are imposed because the TMDL does not establish wasteload allocations for sediment or pH. The TMDL used a surrogate approach for both of those constituents by which reductions of in-stream concentrations of aluminum, iron, and manganese would result in acceptable reductions of sediment and mitigation of acidic pH.

The TMDL's allocated concentrations for aluminum, iron, and manganese are equivalent to the most stringent water quality criteria for those pollutants and those criteria will be imposed as end-of-pipe limits at Outfall 001. The methods used to implement water quality criteria are described in 25 Pa. Code §§ 96.3 and 96.4. Also, DEP's "Water Quality Toxics Management Strategy" [Doc. No. 361-2000-003] addresses design conditions in detail (Table 1 in that document), including the appropriate durations to assign to water quality criteria. The design duration for Criteria Maximum Concentration (CMC) criteria is 1 hour (acute). The design duration for Criteria Continuous Concentration (CCC) criteria is 4 days (chronic). The design duration for Threshold Human Health (THH) criteria is 30 days (chronic). The design duration for Cancer Risk Level (CRL) criteria is 70 years (chronic).

The 750 µg/L aluminum criterion in 25 Pa. Code § 93.8c is a CMC (acute) criterion. Therefore, 750 µg/L is imposed as a maximum daily limit. There is no CCC criterion for aluminum necessitating the imposition of a more stringent average monthly limit. Imposing 750 µg/L as both a maximum daily and average monthly limit is protective of water quality uses.

The 1.5 mg/L iron criterion is given as a 30-day average in 25 Pa. Code § 93.7(a). Therefore, 1.5 mg/L is imposed as an average monthly limit and the maximum daily effluent limit is calculated using a multiplier of two times the average monthly limit based on DEP's "Technical Guidance for the Development and Specification of Effluent Limitations and Other Permit Conditions in NPDES Permits" [Doc. No. 362-0400-001, Chapter 3, pp. 15, 16].

The 1 mg/L potable water supply criterion for manganese in 25 Pa. Code § 93.7(a) is a human health criterion (chronic). Per Table 1 of DEP's "Water Quality Toxics Management Strategy", the duration for a THH criterion is 30 days. Therefore, an average monthly effluent limit of 1 mg/L is imposed, and the maximum daily effluent limit is calculated using a multiplier of two times the average monthly limit consistent with the technical guidance cited above for iron.

Since the allocated concentrations are equivalent to water quality criteria, the Wells Creek STP's compliance with concentration limits for aluminum, iron, and manganese will not result in excursions above water quality criteria and the permit will be consistent with the TMDL's WLAs. Consequently, the TMDL's load limits are not required. The TMDL's wasteload allocations and the applicable WQBELs are summarized in the table below.

Table 7. TMDL WQBELs for Outfall 001

Parameter	Average Monthly (mg/L)	Maximum Daily (mg/L)
Aluminum, Total	0.75	0.75
Iron, Total	1.5	3.0
Manganese, Total	1.0	2.0

STMA did not report aluminum, iron, and manganese concentrations on the NPDES permit renewal application, but DEP does not expect concentrations in the STP's effluent to be significant. Therefore, the new TMDL WQBELs will take effect on the permit effective date.

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 more stringent WQBELs are necessary for TRC as summarized in the table below.

Table 8. WQBELs for TRC at Outfall 001

Parameter	Average Monthly (mg/L)	Instant. Maximum (mg/L)
Total Residual Chlorine	0.114	0.374

Water quality criteria for chlorine have not changed. However, pursuant to DEP's "Standard Operating Procedure for Clean Water Program Establishing Effluent Limitations for Individual Sewage Permits", the in-stream and discharge chlorine demands used for modeling are 0.3 mg/L and 0 mg/L in the absence of site-specific data (compared to 0.8 mg/L and 0 mg/L used to develop the previous TRC limits). The Q_{7-10} of Wells Creek is also slightly lower (0.894 cfs versus 0.915 cfs).

Discharge Monitoring Report data for TRC indicate that STMA will be unable to comply with the new limits—the average of the average monthly and instantaneous maximum TRC concentrations over the last two years are 0.184 mg/L and 0.436 mg/L. Therefore, a two-year schedule of compliance will be imposed pursuant to 25 Pa. Code § 92a.51(a). The existing TRC limits of 0.30 mg/L average monthly and 0.90 mg/L instantaneous maximum will be in effect for the interim two-year period.

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 tables on the following pages.

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 two years after the Permit Effective 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	Instant. Minimum	Average Monthly	Weekly Average	Instant. Maximum		
Flow (MGD)	0.80	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	5.0	XXX	XXX	XXX	1/day	Grab
TRC	XXX	XXX	XXX	0.30	XXX	0.90	1/day	Grab
CBOD5 Nov 1 - Apr 30	165.0	265.0	XXX	25.0	40.0	50.0	1/week	8-Hr Composite
CBOD5 May 1 - Oct 30	70.0	105.0	XXX	11.0	16.0	22.0	1/week	8-Hr Composite
TSS	200.0	300.0	XXX	30.0	45.0	60.0	1/week	8-Hr Composite
Fecal Coliform (No./100 ml) Oct 1 - Apr 30	XXX	XXX	XXX	2000 Geo Mean	XXX	10000	1/week	Grab
Fecal Coliform (No./100 ml) May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	XXX	1000	1/week	Grab
E.Coli (No./100 ml)	XXX	XXX	XXX	XXX	XXX	Report	1/quarter	Grab
Ammonia-Nitrogen May 1 - Oct 31	23.0	XXX	XXX	3.5	XXX	7.0	1/week	8-Hr Composite
Ammonia-Nitrogen Nov 1 - Apr 30	65.0	XXX	XXX	10.0	XXX	20.0	1/week	8-Hr Composite
Total Phosphorus	13.4	XXX	XXX	2.0	XXX	4.0	1/week	8-Hr Composite
Total Nitrogen	XXX	XXX	XXX	XXX	Report Daily Max	XXX	1/year	Grab
Aluminum, Total	XXX	XXX	XXX	0.75	0.75 Daily Max	XXX	1/week	24-Hr Composite

Outfall 001 (continued), Effective Period: Permit Effective Date through two years after the Permit Effective 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	Instant. Minimum	Average Monthly	Weekly Average	Instant. Maximum		
Iron, Total	XXX	XXX	XXX	1.5	3.0 Daily Max	XXX	1/week	24-Hr Composite
Manganese, Total	XXX	XXX	XXX	1.0	2.0 Daily Max	XXX	1/week	24-Hr Composite

Requirements shown in red in the table above are more stringent than the previous permit. Requirements shown in green are less stringent than the previous permit.

Compliance Sampling Location: Outfall 001

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: two years after the 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	Instant. Minimum	Average Monthly	Weekly Average	Instant. Maximum		
Flow (MGD)	0.80	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	5.0	XXX	XXX	XXX	1/day	Grab
TRC	XXX	XXX	XXX	0.114	XXX	0.374	1/day	Grab
CBOD5 Nov 1 - Apr 30	165.0	265.0	XXX	25.0	40.0	50.0	1/week	8-Hr Composite
CBOD5 May 1 - Oct 30	70.0	105.0	XXX	11.0	16.0	22.0	1/week	8-Hr Composite
TSS	200.0	300.0	XXX	30.0	45.0	60.0	1/week	8-Hr Composite
Fecal Coliform (No./100 ml) Oct 1 - Apr 30	XXX	XXX	XXX	2000 Geo Mean	XXX	10000	1/week	Grab
Fecal Coliform (No./100 ml) May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	XXX	1000	1/week	Grab
E.Coli (No./100 ml)	XXX	XXX	XXX	XXX	XXX	Report	1/quarter	Grab
Ammonia-Nitrogen May 1 - Oct 31	23.0	XXX	XXX	3.5	XXX	7.0	1/week	8-Hr Composite
Ammonia-Nitrogen Nov 1 - Apr 30	65.0	XXX	XXX	10.0	XXX	20.0	1/week	8-Hr Composite
Total Phosphorus	13.4	XXX	XXX	2.0	XXX	4.0	1/week	8-Hr Composite
Total Nitrogen	XXX	XXX	XXX	XXX	Report Daily Max	XXX	1/year	Grab
Aluminum, Total	XXX	XXX	XXX	0.75	0.75 Daily Max	XXX	1/week	24-Hr Composite

Permit No. PA0041441

Outfall 001, Effective Period: two years after the 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	Instant. Minimum	Average Monthly	Weekly Average	Instant. Maximum		
Iron, Total	XXX	XXX	XXX	1.5	3.0 Daily Max	XXX	1/week	24-Hr Composite
Manganese, Total	XXX	XXX	XXX	1.0	2.0 Daily Max	XXX	1/week	24-Hr Composite

Requirements shown in red in the table above are more stringent than the previous permit. Requirements shown in green are less stringent than the previous permit.

Compliance Sampling Location: 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 C)
☐	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
☐	Other:

ATTACHMENT A

WQM 7.0 Modeling Results

Summer Analysis

Input Data WQM 7.0

SWP Basin	Stream Code	Stream Name	RMI	Elevation (ft)	Drainage Area (sq mi)	Slope (ft/ft)	PWS Withdrawal (mgd)	Apply FC
18E	45675	WELLS CREEK	2.570	2009.00	13.90	0.00220	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	0.064	0.00	0.00	0.000	0.000	0.0	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	PA0041441	0.8000	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	25.00	2.00	0.00	1.50
Dissolved Oxygen	5.00	9.17	0.00	0.00
NH3-N	4.50	0.00	0.00	0.70

Summer Analysis

Input Data WQM 7.0

SWP Basin	Stream Code	Stream Name	RMI	Elevation (ft)	Drainage Area (sq mi)	Slope (ft/ft)	PWS Withdrawal (mgd)	Apply FC
18E	45675	WELLS CREEK	0.270	1927.00	17.00	0.00220	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	0.064	0.00	0.00	0.000	0.000	0.0	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	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

Summer Analysis

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 Analysis

WQM 7.0 Hydrodynamic Outputs

SWP Basin	Stream Code	Stream Name
18E	45675	WELLS 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												
2.570	0.89	0.00	0.89	1.2376	0.00220	.586	21.64	36.93	0.17	0.836	20.00	6.72
Q1-10 Flow												
2.570	0.57	0.00	0.57	1.2376	0.00220	NA	NA	NA	0.15	0.917	20.00	6.77
Q30-10 Flow												
2.570	1.22	0.00	1.22	1.2376	0.00220	NA	NA	NA	0.18	0.773	20.00	6.68

Summer Analysis

WQM 7.0 Wasteload Allocations

SWP Basin	Stream Code	Stream Name
18E	45675	WELLS 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
2.570	Outfall 001	19.83	9	19.83	9	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
2.570	Outfall 001	2.06	4.09	2.06	4.09	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)		
2.57	Outfall 001	11.72	11.72	3.52	3.52	5	5	0	0

Summer Analysis

WQM 7.0 D.O.Simulation

SWP Basin	Stream Code	Stream Name
18E	45675	WELLS CREEK

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
2.570	0.800	20.000	6.720
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
21.643	0.586	36.929	0.168
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
7.64	0.603	2.04	0.700
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
6.749	3.513	Tsivoglou	6
Reach Travel Time (days)			
0.836			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.084	7.27	1.93	6.42
0.167	6.91	1.82	6.22
0.251	6.57	1.71	6.12
0.335	6.25	1.62	6.09
0.418	5.94	1.52	6.11
0.502	5.65	1.44	6.16
0.586	5.37	1.36	6.24
0.669	5.11	1.28	6.34
0.753	4.86	1.21	6.44
0.836	4.62	1.14	6.55

Summer Analysis

WQM 7.0 Effluent Limits

SWP Basin	Stream Code	Stream Name
18E	45675	WELLS 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)
2.570	Outfall 001	PA0041441	0.800	CBOD5	11.72		
				NH3-N	3.52	7.04	
				Dissolved Oxygen			5

Winter Analysis

Input Data WQM 7.0

SWP Basin	Stream Code	Stream Name	RMI	Elevation (ft)	Drainage Area (sq mi)	Slope (ft/ft)	PWS Withdrawal (mgd)	Apply FC
18E	45675	WELLS CREEK	2.570	2009.00	13.90	0.00220	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	0.129	0.00	0.00	0.000	0.000	0.0	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	PA0041441	0.8000	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	25.00	2.00	0.00	1.50
Dissolved Oxygen	5.00	12.80	0.00	0.00
NH3-N	13.50	0.00	0.00	0.70

Winter Analysis

Input Data WQM 7.0

SWP Basin	Stream Code	Stream Name	RMI	Elevation (ft)	Drainage Area (sq mi)	Slope (ft/ft)	PWS Withdrawal (mgd)	Apply FC
18E	45675	WELLS CREEK	0.270	1927.00	17.00	0.00220	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	0.129	0.00	0.00	0.000	0.000	0.0	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	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

Winter Analysis

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 Analysis

WQM 7.0 Hydrodynamic Outputs

SWP Basin	Stream Code	Stream Name
18E	45675	WELLS 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												
2.570	1.79	0.00	1.79	1.2376	0.00220	.613	24.14	39.4	0.20	0.687	9.09	6.64
Q1-10 Flow												
2.570	1.14	0.00	1.14	1.2376	0.00220	NA	NA	NA	0.18	0.786	10.20	6.69
Q30-10 Flow												
2.570	2.43	0.00	2.43	1.2376	0.00220	NA	NA	NA	0.23	0.617	8.37	6.61

Winter Analysis

WQM 7.0 Wasteload Allocations

SWP Basin	Stream Code	Stream Name
18E	45675	WELLS 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
2.570	Outfall 001	29.91	27	29.91	27	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
2.570	Outfall 001	4.43	13.12	4.43	13.12	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)		
2.57	Outfall 001	25	25	13.12	13.12	5	5	0	0

Winter Analysis

WQM 7.0 D.O.Simulation

SWP Basin	Stream Code	Stream Name
18E	45675	WELLS CREEK

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
2.570	0.800	9.091	6.643
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
24.144	0.613	39.395	0.204
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
11.41	1.293	5.37	0.302
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
9.609	3.299	Tsivoglou	6
Reach Travel Time (days)			
0.687			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.069	10.81	5.26	8.74
0.137	10.24	5.15	8.10
0.206	9.71	5.04	7.64
0.275	9.20	4.94	7.32
0.344	8.72	4.84	7.10
0.412	8.26	4.74	6.98
0.481	7.82	4.64	6.92
0.550	7.41	4.54	6.91
0.619	7.03	4.45	6.94
0.687	6.66	4.36	7.00

Winter Analysis

WQM 7.0 Effluent Limits

SWP Basin	Stream Code	Stream Name
18E	45675	WELLS 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)
2.570	Outfall 001	PA0041441	0.800	CBOD5	25		
				NH3-N	13.12	26.24	
				Dissolved Oxygen			5

ATTACHMENT B

TMDL Waste Load Allocations

Kiskiminetas River Watershed Minor Non-Mining Wasteload Allocations

Region	SWS	PERMIT	PIPE	Metal	Baseline Load (lbs/yr)	Baseline Concentration (mg/L)	Allocated Load (lbs/yr)	Allocated Concentration (mg/L)	% Reduction	Comments
6	4223	PA0041441	1	Aluminum	1,828	0.75	1,828	0.75	0	
6	4223	PA0041441	1	Iron	3,656	1.50	3,656	1.50	0	
6	4223	PA0041441	1	Manganese	2,437	1.00	2,437	1.00	0	

ATTACHMENT C

TRC Modeling Results

TRC EVALUATION – Outfall 001

0.894	**= Q stream (cfs)**	**0.5**	**= CV Daily**
0.8	**= Q discharge (MGD)**	**0.5**	**= CV Hourly**
30	**= no. samples**	**1**	**= 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 = 0.249	**1.3.2.iii**	WLA cfc = 0.236
PENTOXSD TRG	**5.1a**	LTAMULT afc = 0.373	**5.1c**	LTAMULT cfc = 0.581
PENTOXSD TRG	**5.1b**	LTA_afc= 0.093	**5.1d**	LTA_cfc = 0.137

Source	Reference	Effluent Limit Calculations	
PENTOXSD TRG	**5.1f**	AML MULT = 1.231	
PENTOXSD TRG	**5.1g**	AVG MON LIMIT (mg/l) = 0.114	AFC
		INST MAX LIMIT (mg/l) = 0.374	

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)**