pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Southcentral Regional Office
CLEAN WATER PROGRAM

Application Type	**Renewal**	Application No.	**PA0031135**
Facility Type	**Municipal**	APS ID	**18661**
Major / Minor	**Major**	Authorization ID	**965291**

NPDES PERMIT FACT SHEET
INDIVIDUAL SEWAGE

Applicant and Facility Information

Applicant Name	**Kutztown Borough Berks County**	Facility Name	**Kutztown STP**
Applicant Address	45 Railroad Street	Facility Address	503 Krumsville Road
	Kutztown, PA 19530-1112		Kutztown, PA 19530
Applicant Contact	Gabriel Khalife, Boro Manager	Facility Contact	Jarrad Burkert, Wastewater Superintendent
Applicant Phone	(610) 683-6131	Facility Phone	(610) 683-3404
Client ID	5972	Site ID	452165
Ch 94 Load Status	Not Overloaded	Municipality	Maxatawny Township
Connection Status	No Limitations	County	Berks
Date Application Received	February 25, 2013	EPA Waived?	No
Date Application Accepted	March 6, 2013	If No, Reason	Major Facility
Purpose of Application	NPDES Renewal		

Summary of Review

The previous NPDES sewage permit was issued August 26, 2008 and administratively extended past the expiration date of August 31, 2013. The permit is recommended for renewal with some changes, as explained in this Fact Sheet. The Sewage Treatment Plant (STP) serves the Borough of Kutztown (47%), Kutztown University (50%), and Maxatawny Township (3%) per the renewal application. The collection system includes 4 pumping stations.

Industrial Users:

The NPDES renewal application represented that there were no Industrial Users contributing wastewater to the treatment facility. The facility's 2018 Chapter 94 Municipal Wasteload Report included no list of industrial users, as required by the report instructions. In a phone conversation on August 7, 2019, the permit writer confirmed with Mr. Burkert, the Wastewater Superintendent, that there are no industrial users contributing industrial wastewater to the STP.

Combined Sewer Outfalls: N/A

Hauled in Wastes: N/A (as confirmed by Mr. Burkert in August 7, 2019 phone conversation)

Design flow:

The renewal application did not indicate a change in the design flow. The previous permit, the previous WQM permit, and the renewal application all indicate a design discharge flow of 1.5 MGD. Electronic Discharge Monitoring Reports (DMRs)

Approve	Deny	Signatures	Date
x		Bonnie J. Boylan / Environmental Engineering Specialist	August 9, 2019
		Daniel W. Martin, P.E. / Environmental Engineer Manager	
		Maria D. Bebenek, P.E. / Program Manager	

Summary of Review

from April 1, 2017, through June 30, 2019, indicate a Monthly Average flow of 1.2 MGD with five months out of 27 in which the Monthly Average flow exceeded the design flow of 1.5 MGD.

The 2017 Chapter 94 Municipal Wasteload Report indicated that the facility was operating under its hydraulic capacity and under its organic load capacity. The 2017 report was reviewed and accepted by DEP's Sewage Planning staff. The 2018 Chapter 94 Municipal Wasteload Report has not yet been reviewed by DEP's Sewage Planning staff. The 2018 Ch 94 report that was submitted indicated that a) the facility's projected Annual Average Flow over the next five years and the projected Maximum-3-Month-Average flow over the next five years would remain under 1.5 MGD, and b) the facility's projected Annual Average organic loading over the next five years and the projected Maximum Average organic loading over the next five years would remain under 2500 lbs of BOD5/day.

The DEP concurred in an October 3, 2017 letter that the Corrective Action Plan (CAP) was completed and closed for hydraulic overloading at the Highland Avenue pump station. The DEP concurred in a January 24, 2018 letter that the Corrective Action Plan (CAP) was completed and closed for organic overloading at the POTW.

The renewal permit limits have therefore continued to be based on a design discharge flow of 1.5 MGD.

Sludge Disposal:

Sludge has been hauled off-site, most recently to Pottstown WWTP, Exeter Twp WWTP, and Lehigh County Authority, all of which have NPDES permits. The facility has reed beds that can receive sludge as well, with the reed beds cleaned and waste sent to a landfill as needed. According to Mr. Burkert in a phone conversation on August 7, 2019, the reed beds have a PVC liner.

Unresolved Violations:
None per eFacts and WMS databases (as of 8/5/2019).

Delaware River Basin Commission (DRBC):

The DRBC docket for this facility is D-1989 -039 CP-3 which was approved December 4, 2013 and expired August 31, 2018. A draft docket renewal is pending: D-1989-039 CP-4.

Note that the DEP has chosen to require influent sampling for BOD5 whereas the DRBC draft docket requires influent sampling for CBOD5. The DEP requires all sewage treatment plants subject to Chapter 94 annual reporting to report BOD5 and wishes to continue to be able to compare all treatment plants' loading in a consistent manner.

State regulations at 25 Pa Code 92a.47(a) require:
"Sewage, except that discharged from a CSO …shall be given a minimum of secondary treatment. Secondary treatment for sewage is that treatment that …accomplishes the following: …(3) On a concentration basis, the monthly average percent removal of BOD5 or CBOD5 and TSS, must be at least 85% for POTW facilities."

This requirement is included in DEP's NPDES permits for sewage facilities in the requirements that follow the limits tables.

In accordance with State regulations and an interagency agreement, a copy of the Fact Sheet and draft permit will also be sent to the DRBC. Any comments from the DRBC will be considered.

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)	1.5
Latitude	40º 31' 40"	Longitude	-75º 47' 2"
Quad Name		Quad Code	
Wastewater Description:	Sewage Effluent		
Receiving Waters	Sacony Creek	Stream Code	2008
NHD Com ID	25978384/Reach 02040203000437	RMI	7.4 per eMapPA (Differs from last PR/permit)
Drainage Area	21.8 mi^2 per PA StrmStats	Yield (cfs/mi^2)	0.11
Q_{7-10} Flow (cfs)	2.3	Q_{7-10} Basis	Gage Correlation
Elevation (ft)	395' (est. – eMapPA)	Slope (ft/ft)	
Watershed No.	3-B	Chapter 93 Class.	TSF, MF
Existing Use *	CWF(COLD WATER FISHES)*,MF	Existing Use Qualifier	Use Attainability Analysis
Exceptions to Use		Exceptions to Criteria	
Assessment Status	Attaining Use(s)		
Cause(s) of Impairment			
Source(s) of Impairment			
TMDL Status	**TMDL exists downstream**	Name	**Lake Ontelaunee**

This segment of Sacony Creek is designated as "Trout Natural Reproduction". It is NOT designated Class A/Wild Trout.

Background/Ambient Data – Not Available		Data Source
pH (SU)		
Temperature (°F)		
Hardness (mg/L)		
Nearest Downstream Public Water Supply Intake		Reading Area Water Authority
PWS Waters	Lake Ontelaunee	Flow at Intake (cfs)
PWS RMI	Approx.. 3.2	Distance from Outfall (mi) >14 miles

* DEP has evaluated information indicating that the existing use of the receiving waters is different than the designated use under 25 Pa. Code § 93.9. In developing the draft NPDES permit, DEP is proposing to protect the existing use of the receiving waters. Following DEP's notice of the receipt of the application and the draft permit in the Pennsylvania Bulletin, DEP will accept written comments during the public comment period regarding DEP's tentative determination to protect the existing use. DEP will make a final determination on existing use protection for the receiving waters as part of the final permit action.

Secondary waters:
Sacony Creek flows into Maiden Creek at RMI 11.0 (TSF, existing use same as designated use, impaired for recreational use due to pathogens); Maiden Creek flows into Lake Ontelaunee which is impaired for nutrients and then into Schuylkill River.

Other Comments:
The estimated Q7-10 from PA Strm Stats at the discharge location could not be used because it appears unreasonable: upstream of Kutztown on the Sacony Creek, PA Strm Stats estimated the Q7-10 as 0.8 cfs but at this location downstream of Kutztown, it estimated the Q7-10 as 13.7 cfs. even though no large streams contribute to Sacony Creek in that segment. As was done in the last Protection Report (and the 2003 Protection Report), correlation with downstream gage 01470756 (maiden Creek at Virginville) was used instead: Q7-10 of 16.7 cfs and drainage area of 159 mi^2 per USGS Stucky and Roland report. Low Flow Yield = Q7-10 / D.A. = 16.7/159 = 0.11 cfs/mi^2. The Q7-10 at the facility= 0.11 cfs/mi^2 x D.A. at site of 21.8 = 2.4 cfs. There were no other upstream or downstream gages with historic low-flow data records.

Treatment Facility Summary

Treatment Facility Name: Kutztown STP

WQM Permit No.	Issuance Date
0605409	6/5/2005
0605409 A-1	6/29/2012
0605409 A-2	5/16/2018

Waste Type	Degree of Treatment	Process Type	Disinfection	Avg Annual Flow (MGD)
Sewage	Secondary With Ammonia Reduction	Trickling Filter With Settling	Ultraviolet	1.5

Hydraulic Capacity (MGD)	Organic Capacity (lbs/day)	Load Status	Biosolids Treatment	Biosolids Use/Disposal
1.5	2502	Not Overloaded	Anaerobic Digestion	Other WWTP

4 Pump Stations
2 Grinders
1 Grit Removal
1 Wet well
1 Fine Screen
4 Primary Clarifiers
2 Trickling Filters
2 Intermediate Clarifiers
1 Lift Station
1 Biotower, plastic media
2 Final Clarifiers
2 UV Disinfection Units
2 Recycle/Flood Pumps
1 Digester
1 Sludge Holding Tank
3 Reed Beds (as standby)

Compliance History

DMR Data for Outfall 001 (from July 1, 2018 to June 30, 2019)

Parameter	JUN-19	MAY-19	APR-19	MAR-19	FEB-19	JAN-19	DEC-18	NOV-18	OCT-18	SEP-18	AUG-18	JUL-18
Flow (MGD) Average Monthly	0.9913	1.2777	1.5267	1.7544	1.4562	1.4359	1.3813	1.5794	1.1502	1.4534	1.8250	0.7520
Flow (MGD) Daily Maximum	1.8943	2.5922	2.1705	2.7364	1.9607	2.6714	2.0986	2.4679	1.7039	1.9488	3.2040	1.2880
pH (S.U.) Minimum	8.0	7.8	7.7	7.8	7.8	7.9	7.8	7.9	7.7	7.7	7.8	8.0
pH (S.U.) Maximum	8.3	8.3	8.0	8.1	8.0	8.1	8.2	8.4	8.2	8.2	8.4	8.3
DO (mg/L) Minimum	9.0	9.2	9.4	9.5	9.2	9.9	9.4	7.8	8.0	7.6	5.7	8.1
TRC (mg/L) Average Monthly	0.01	0.01	0.01	0.01	0.01	< 0.01	< 0.01	0.01	0.02	0.01	0.01	0.01
TRC (mg/L) Instantaneous Maximum	0.02	0.03	0.02	0.01	0.02	0.01	0.02	0.02	0.07	0.03	0.03	0.02
CBOD5 (lbs/day) Average Monthly	18.79	37.70	50.68	42.37	49.16	33.48	47.14	66.21	41.88	60.89	67.69	13.76
CBOD5 (lbs/day) Weekly Average	40.03	48.50	69.78	51.14	70.82	47.63	70.92	98.73	78.62	73.34	103.67	18.92
CBOD5 (mg/L) Average Monthly	2.1	3.4	3.7	2.9	3.9	2.6	4.5	4.7	4.0	4.9	4.5	2.2
CBOD5 (mg/L) Weekly Average	3.4	4.5	4.1	3.3	5.9	3.0	5.4	7.0	6.2	5.5	6.3	2.5
BOD5 (lbs/day) Raw Sewage Influent Average Monthly	587	967	2117	1382	1667	1012	1179	1762	1629	1418	997	975
BOD5 (lbs/day) Raw Sewage Influent Daily Maximum	1267	1620	3918	2534	3114	2010	1877	3911	2258	2103	2543	1735
BOD5 (mg/L) Raw Sewage Influent Average Monthly	65.44	93.78	157.91	94.49	128.41	83.40	124.61	123.83	160.56	115.68	72.11	175.83
TSS (lbs/day) Average Monthly	77.0	159.5	167.4	162.7	135.6	146.1	116.2	175.0	97.2	152.3	152.9	58.0

TSS (lbs/day) Raw Sewage Influent Average Monthly	824	1094	2247	1170	1299	986	1066	1608	1404	1149	899	2268
TSS (lbs/day) Raw Sewage Influent Daily Maximum	1643	2134	4887	3500	2204	1560	1563	3540	3335	2626	1950	11253
TSS (lbs/day) Weekly Average	161.6	221.0	224.8	198.2	178.3	269.6	251.7	209.7	151.4	162.9	163.4	71.4
TSS (mg/L) Average Monthly	9.0	13.9	12.2	11.0	10.4	11.3	12.1	12.5	9.4	12.4	10.4	9.7
TSS (mg/L) Raw Sewage Influent Average Monthly	92.8	101.4	167.4	76.8	102.9	79.2	112.2	116.3	135.4	92.8	66.6	407.1
TSS (mg/L) Weekly Average	13.6	14.6	13.6	12.6	16.6	19.0	18.4	12.4	12.0	13.4	12.2	11.6
Total Suspended Solids (lbs) Total Monthly	2311	4945	5022	5044	3797	4530	3603	5250	3012	4569	4739	1799
Total Suspended Solids (lbs) Total Annual										37045.00		
Fecal Coliform (CFU/100 ml) Geometric Mean	4	3	2	2	2	5	2	6	6	8	29	4
Ammonia (lbs/day) Average Monthly	0.9	2.7	6.4	6.5	17.2	10.9	12.7	18.2	13.1	21.4	9.2	0.6
Ammonia (mg/L) Average Monthly	0.11	0.26	0.45	0.45	1.37	0.77	1.53	1.27	1.31	1.72	0.7	0.1
Total Phosphorus (lbs/day) Average Monthly	5.1	9.6	13.7	10.1	10.3	6.7	9.0	13.8	9.9	13.2	10.8	3.5
Total Phosphorus (mg/L) Average Monthly	0.6	0.9	1.0	0.7	0.8	0.5	0.9	1.0	0.9	1.1	0.7	0.6
Total Phosphorus (lbs) Total Monthly	153	299	412	312	289	208	280	415	308	395	334	110
Total Phosphorus (lbs) Total Annual										3383.0		

Compliance History

NOV - issued for a February 24, 2014 incident: discharge of untreated or inadequately treated sewage from the treatment plant; resolved May 28, 2014.

Most recent DEP Inspections:

8/1/2018 – No violations.

9/22/2017 – No violations.

8/11/2016 – No violations.

8/7/2015 – No violations.

6/5/2014 – No violations.

PREVIOUS PERMIT LIMITS :

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly	Weekly Average	Instantaneous Minimum	Average Monthly	Weekly Average	Instant. Maximum		
Flow (MGD)	Report	Report Daily Max	XXX	XXX	XXX	XXX	Continuous	Measured
Influent (BOD5 and TSS)	Report	Report Daily Max	XXX	Report	XXX	XXX	2/month	24-Hr Composite
pH (S.U.)	XXX	XXX	6.0	XXX	XXX	9.0	1/day	Grab
Dissolved Oxygen	XXX	XXX	5.0	XXX	XXX	XXX	1/day	Grab
Total Residual Chlorine	XXX	XXX	XXX	0.13	XXX	0.44	1/day	Grab
Total Suspended Solids	375	563	XXX	30	45	60	2/week	24-Hr Composite
CBOD5 May 1 - Oct 31	188	281	XXX	15	22.5	30	2/week	24-Hr Composite
CBOD5 Nov 1 - Apr 30	313	501	XXX	25	40	50	2/week	24-Hr Composite
Ammonia May 1 - Oct 31	63	XXX	XXX	5.0	XXX	30	2/week	24-Hr Composite
Ammonia Nov 1 - Apr 30	189	XXX	XXX	15	XXX	60	2/week	24-Hr Composite
Total Phosphorus	Report	XXX	XXX	Report	XXX	XXX	2/week	24-Hr Composite
Fecal Coliform May 1 – Sept 30	XXX	XXX	XXX	200	XXX	XXX	2/week	Grab
Fecal Coliform Oct 1 – Apr 30	XXX	XXX	XXX	2000	XXX	XXX	2/week	Grab
Total Suspended Solids (lbs)	Report	136,984 Total Annual	XXX	XXX	XXX	XXX	1/month	Calculate
Total Phosphorus (lbs)	Report	4566 Total Annual	XXX	XXX	XXX	XXX	1/month	Calculate

Development of Effluent Limitations

Outfall No. 001 **Design Flow (MGD)** 1.5
Latitude 40º 31' 40" **Longitude** -75º 47' 2"
Wastewater Description: Sewage Effluent

Technology-Based Effluent Limitations (TBELs)

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

Pollutant	Limit (mg/l)	SBC	Federal Regulation	State Regulation	DRBC Regulation
$CBOD_5$	25	Average Monthly	133.102(a)(4)(i)	92a.47(a)(1)	
	40	Average Weekly	133.102(a)(4)(ii)	92a.47(a)(2)	
Total Suspended Solids (TSS)	30	Average Monthly	133.102(b)(1)	92a.47(a)(1)	
	45	Average Weekly	133.102(b)(2)	92a.47(a)(2)	
pH	6.0 – 9.0 S.U.	Min – Max	133.102(c)	95.2(1)	
Fecal Coliform (5/1 – 9/30)	200 / 100 ml	Geo Mean	-	92a.47(a)(4)	
Fecal Coliform (5/1 – 9/30)	1,000 / 100 ml	IMAX	-	92a.47(a)(4)	
Fecal Coliform (10/1 – 4/30)	2,000 / 100 ml	Geo Mean	-	92a.47(a)(5)	
Fecal Coliform (10/1 – 4/30)	10,000 / 100 ml	IMAX	-	92a.47(a)(5)	
Total Residual Chlorine	0.5	Average Monthly	-	92a.48(b)(2)	
Total Phosphorus (TP)	2*	Average Monthly	-	96.5(c)	
Ammonia	20	Average Monthly			18 CFR Part 410
Total Dissolved Solids	1000	Average Monthly			18 CFR Part 410 / Docket D-1989 - 039 CP-3 (& 4)

*for discharges to nutrient -impaired waters and/or the more stringent controls as a result of developed TMDL. Although the receiving water at this segment of the Sacony Creek has not been identified as impaired, the downstream waters have been. (Also see the discussion of Phosphorus in the TMDL section of this Fact Sheet.)

ELGs: N/A, not applicable (No industrial wastewater contributions)

Best Professional Judgement Limitations (TBEL/BPJ)

N/A , Not applicable

Water Quality-Based Effluent Limitations (WQBELs)

TMDL:

A TMDL for Nutrient and Suspended Sediment was prepared in August 2004 for the downstream Lake Ontelaunee. EPA approved the TMDL and DEP published final Notice in for the TMDL in the April 30, 2005 PA Bulletin. Waste Load Allocations (WLA's) were assigned to Kutztown STP for TSS and TP (see attached). The previous permit imposed limits of 136,984 lbs/year for TSS and 4566 lbs/year for TP. These limits are protective of the downstream impaired lake and will be carried forward in compliance with anti-backsliding rules.

Both the regulatory limits, as monthly averages, and the TMDL cap loads are being imposed to control TSS and TP in the short-term and in the long-term, as requested by EPA for similar permits. A request was also made by the downstream

water supplier and agreed to by DEP in May 2014 to include the regulatory limit of 2.0 mg/l as a monthly average for TP for designated dischargers upstream of the public water supply intake. Kutztown STP is one of the designated dischargers. The letter agreement dated May 7, 2014, is attached to this Fact Sheet.

It is noted that TP at 2 mg/l as a monthly average, would not be sufficient for the facility to achieve their annual load limit:

2 mg/l for TP x 1.5 MGD x 8.34 c.f. x 365 days/year = 9132.3 lbs/year > 4566 lbs/year permit limit

Imposing a more stringent monthly average limit back-calculated to achieve the capload, however, would reduce flexibility and has therefore not been implemented: 4566 lbs/year / (1.5 MGD x 8.34 x 365) = 0.5 mg/l.

Other than TMDL:

Note: the DEP's previous application (3800-PM-WSFR009b, 'Long Form' for Sewage Dischargers) did not require sampling for pollutants other than Group I pollutants when only sanitary wastewater was discharged, even for treatment plants over 1 MGD. The application form changed in February 2013 but there was a grace period since some applicants had already completed their applications using the old form and followed the old form's instructions. The Group I pollutants included Total Copper, Total Lead, and Total Zinc. Because the permittee complied with the requirements in place at the time, their application was considered complete.

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

Parameter	Limit (mg/l)	SBC	Model
CBOD5, May 1-Oct 31	14.5	Monthly Average	WQM 7.0 version 1.0b
CBOD5, Nov 1-Apr 30	25	Maximum	WQM 7.0 version 1.0b
Dissolved Oxygen	5	Instant Minimum	WQM 7.0 version 1.0b
Ammonia, May 1-Oct 31	3.2	Monthly Average	WQM 7.0 version 1.0b
Ammonia, May 1-Oct 31	6.4	Maximum	WQM 7.0 version 1.0b
Ammonia, Nov 1-Apr 30	10.8	Monthly Average	WQM 7.0 version 1.0b
Ammonia, Nov 1-Apr 30	21.6	Maximum	WQM 7.0 version 1.0b
Total Residual Chlorine	0.13	Monthly Average	Excel Spreadsheet for TRC
Total Residual Chlorine	0.41	Instant Maximum	Excel Spreadsheet for TRC

When there are site-specific data available, the data can be used to provide more accurate model results. Site-specific data can be forwarded by applicants with permit applications. None were in this case. When site-specific data is not available, default values are used as model input variables.

CBOD5, Ammonia (NH3-N), and Dissolved Oxygen (DO)

There was another STP in close proximity to the Kutztown facility: Maxatawny MUA, NPDES permit PA0260151. The model simulation included both Kutztown STP and the downstream Maxatawny STP; in fact, the Dissolved Oxygen level was still declining at the stream RMI of Maxatawny STP's outfall so this downstream STP must be included in the modeling. DEP uses the WQM 7.0 water quality model which is designed to determine appropriate permit requirements. DEP's Technical Guidance document 391-2000-007 provides the technical methods and calculations contained in WQM 7.0. The WQM 7.0 model pages are attached: they show input variables, hydrodynamics, and results.

The previous permit allowed less stringent limits during the colder months for CBOD5 and for NH3. A second (and third) WQM 7.0 model simulation was run to represent cold weather conditions: the second model simulation adjusted the Q7-10 upward by a factor of 1.6 and used a stream temperature of 5.6°C (the equivalent of 42°F) to estimate November conditions and the third simulation adjusted the Q7-10 upwards by a factor of 3.2 and used a stream temperature of 3.3°C to estimate January conditions. The flow adjustment factors and the stream temperatures were estimates from state-wide data collection that were taken from the DEP's Technical Guidance document 391-2000-017: Implementation Guidance for Temperature Criteria. The "November" simulation provided the more protective WQBELs and have been imposed in

the draft permit for the colder months: 25 mg/l as a Monthly Average for CBOD5, 10.8 mg/l as a Monthly Average for NH3, and 21.6 mg/l as a Maximum for NH3.

The reviewed eDMRs, 27 months of reported data from April 1, 2017 through June 30, 2019, indicate that the facility can meet the more stringent CBOD5 and NH3 limits without a compliance schedule. The maximum Monthly Average for CBOD5 for any month was 7.5 mg/l, compared to the proposed CBOD5 limit for warm months of 14.5 mg/l. The maximum Monthly Average for NH3 for the warm months of May -October was 2.2 mg/l, compared to the proposed NH3 limit for warm months of 3.3 mg/l. The maximum Monthly Average for NH3 for the colder months of November -April was 5.3 mg/l, compared to the proposed NH3 limit for cold months of 10.8 mg/l.

If this were a new facility or an expanding facility discharging to a stream that had been designated as "Trout Natural Reproduction", the WQM 7.0 model would have been re-run to ensure that Dissolved Oxygen levels remained above 8 mg/l during early life stages, which are recognized as occurring October through May. (Conservative estimates of the stream flow during those times would be used rather than the Q7-10 design flow as well as corresponding estimates of the stream temperature.) This facility is an existing discharger, however. The stream has been classified as Trout Natural Reproduction while this discharge has been occurring. No increases in flow and no changes in industrial indirect users are proposed at this time that would interfere with continuing to attain the "Trout Natural Reproduction" designation.

TRC

Even though the facility's upgrade included UV disinfection, the facility contact expressed a desire to keep Chlorine as a back-up disinfection option. TRC limits will remain in the permit for this reason. The spreadsheet to calculate the TRC WQBEL resulted in the same Monthly Average limit (0.13 mg/l) and a slightly more stringent Instant Maximum limit (0.41 mg/l) than the previous permit limit (0.44 mg/l).

TOXICS

A "Reasonable Potential Analysis" (see attached Toxic Screening Analysis worksheet) determined the following toxic parameters were candidates for limitations: **Total Dissolved Solids (TDS) and Total Copper**. "Reasonable Potential" refers to a pollutant having the potential to cause an in-stream exceedance of a surface water quality criteria after a designated "compliance time" in which the discharge mixes with the receiving stream. The Reasonable Potential Analysis compares concentrations in the effluent with surface water quality criteria. When the effluent concentration exceeds the most stringent water quality criterion, the toxic parameter is considered a candidate for modeling. DEP uses the PENTOX model to calculate WLAs and WQBELs. The PENTOX model pages are attached: they show input variables, hydrodynamics, and results. The discharge Hardness value of 279 was taken from the permit application and reflects the average of three effluent samples. Technical Guidance document 391-2000-011 describes how the PENTOX model works. After the model is run, the effluent concentrations are then compared to the Monthly Average WQBELs calculated. The Toxics Screening Analysis (TSA) worksheet recommends 1) establishing limits or 2) imposing only monitoring in the permit to obtain more data or 3) no limits or monitoring are needed.

In the case of Kutztown, the TSA recommends a monitoring requirement for Total Copper. Because the surface water quality criteria for Copper is Hardness-dependent, a monitoring requirement for Hardness in the effluent has also been included; the discharge hardness effects the WQBEL result. The application indicated an effluent concentration of 14 ug/l, based on three samples. The PENTOX model calculated a WQBEL of 33.7 ug/l as a Monthly Average and 52.5 ug/l as a Daily Maximum. Whereas the effluent concentration is less than the WQBEL, the variability of the Total Copper concentrations in the effluent is unknown and only three effluent samples averaged together in the application does not give adequate information to determine if a permit limit is needed to prevent the discharge from causing an exceedance of the in-stream criteria. The previous permit did not include a limit for Total Copper.

The TSA identified TDS as a candidate for a WQBEL because the effluent concentration exceeded the human health criterion of 500 mg/l. The PENTOX model, however, would only generate a TDS WQBEL if there were a Public Water Supply intake close enough to be impacted and the model was run with the PWS location and withdrawal rate included in the simulation. The Hydrodynamics page of the attached PENTOX model simulation does not indicate that the TDS human health criterion of 500 mg/l would be exceeded at the downstream PWS:

18.2 minutes for complete mix (applicable to human health criteria, non-carcinogens) x 0.226 ft/sec velocity
x 60 sec/minutes = 246.8 feet which is much less than the 14 miles to the PWS intake.

As such, a WQBEL-based permit limit is not deemed needed.

Whole Effluent Toxicity (WET)

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

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

The dilution series used for the tests was: 100%, 73.4%, 53.8%, 39.5%, and 29%. The Target Instream Waste Concentration (TIWC) to be used for analysis of the results is: 53.8%.

Summary of Four Most Recent Test Results

NOEC/LC50 Data Analysis

	***Ceriodaphnia* Results (% Effluent)**			***Pimephales* Results (% Effluent)**			
Test Date	**NOEC Survival**	**NOEC Reproduction**	**LC50**	**NOEC Survival**	**NOEC Growth**	**LC50**	**Pass? ***
6/26/2012	100%	100%	100%	100%	100%	100%	Yes
9/25/2012	100%	29%	100%	100%	100%	100%	No
12/11/2012	100%	73.4%	100%	73.4%	100%	100%	Yes
3/19/2013	100%	100%	100%	100%	100%	100%	Yes

***** *A "passing" result is that which is greater than or equal to the TIWC value.*

There was no explanation provided for the failure of the Ceriodaphnia NOEC Reproduction endpoint of the September 2012 test. The facility was contacted to inquire if a re-test had been performed: the answer was 'no'.

Is there reasonable potential for an excursion above water quality standards based on the results of these tests? (*NOTE – In general, reasonable potential is determined anytime there is at least one test failure in the previous four tests).*

☒ **YES** ☐ **NO**

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

Acute Partial Mix Factor (PMFa): 0.9 Chronic Partial Mix Factor (PMFc): 1.0

(The above PMFs were calculated by DEP's PENTOX model, Wasteload Allocations page.)

1. Determine IWC – Acute (IWCa):

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

[(1.5 MGD x 1.547) / ((2.3 cfs x **0.9**) + (1.5 MGD x 1.547))] x 100 = **IWCa% = 53%**

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

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

Determine Target IWCc (If Chronic Tests Required)

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

[(1.5 MGD x 1.547) / ((2.3 cfs x **1**) + (1.5 MGD x 1.547))] x 100 = **TIWCc% = 50%**

3. Determine Dilution Series

Dilution Series = 100%, 75%, 50%, 25%, and 13%.

WET Limits

Has reasonable potential been determined? ☒ YES ☐ NO

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

If WET limits will be established, identify the species and the limit values for the permit (TU).

Chronic toxicity for Ceriodaphnia dubia-reproduction, Daily Maximum limit of 2.0 TUc

OTHER THAN LIMITS:

Nutrient Monitoring

Nutrient levels in rivers and streams are a concern. In order to gather information to assess the situation and to adequately protect the waterways, most NPDES permits are now including a monitoring requirement, at a minimum, for Total Nitrogen and Total Phosphorus. The statutory basis for this requirement is found at Chapter 92a.61. Phosphorous is already monitored and limited in the permit. Monitoring for TN has been added to the draft renewal permit. Because this requirement is to gather data and not to demonstrate compliance with a limit, a frequency of once per month has been included.

Sample Types/Frequencies

The sample type of '24-hour composite' has been continued from the existing permit for the majority of parameters. The sample type of 'Grab' will be continued for those parameters requiring grab samples: pH, DO, TRC, and Fecal Coliform. Sample frequencies are carried forward from the existing permit, or taken from the recommendations found in the Permit Writers Manual 362-0400-001, or copied from the WMS permit template (DEP software), or based on BPJ.

The influent monitoring for BOD5 and TSS was only twice per month in the previous permit. The influent monitoring should be reported more frequently: it is useful for process control and to ensure the concentrations are accurate. Other major public sewage treatment plants in SCRO require influent monitoring for BOD5 and TSS much more frequently than twice per month. The frequency in the draft renewal permit has been changed to twice per week, the same frequency as required for CBOD5 and TSS effluent sampling.

TDS Baseline

In order to implement the regulations at Chapter 95.10 relevant to imposing TDS limits if increased TDS loads trigger this requirement in the future, a TDS Baseline needs to be documented. The increase of TDS loads is measured against existing mass loads, described in Chapter 95.10(a)(1) as "maximum daily discharge loads of TDS…that were authorized by the Department prior to August 21, 2010." The 2013 renewal application did not provide a maximum concentration value in the effluent sampling, only an average of 785.3 mg/l based on three samples. The June 2008 permit application provided no results for TDS concentration in the effluent. Therefore, the following estimate has been made based on the available data:

785.3 mg/l x 1.5 MGD x 8.34 conversion factor = 6549.5 lb/day

Stormwater

There are no stormwater discharges according to the application, DEP inspection reports, and phone conversation with Mr. Burkert on August 7, 2019.

Anti-Backsliding

No effluent limits from the previous permit have been made less stringent, thus satisfying federal regulations and the federal Clean Water Act.

Antidegradation

All effluent limitations and monitoring requirements have been developed to ensure that existing and designated in-stream uses and the level of water quality necessary to protect the existing and designated uses are maintained and protected. The receiving water is not classified as a High Quality or Exceptional Value waterway.

CHANGES FROM PREVIOUS PERMIT'S LIMITS TABLES AND PART C CONDITIONS:

-The IMAX limit for TRC is slightly more stringent.
- IMAX limits for Fecal Coliform have been added and the reporting units changed.
- The concentration limits for CBOD5 during the months of May-Oct are more stringent.
-The concentration limits for Ammonia are more stringent.
- A monthly average concentration limit for TP has been added.
- A chronic toxicity limit for Ceriodaphnia dubia-Reproduction endpoint has been added.
- WET tests must be conducted on an ongoing basis, not just when the renewal application is prepared, using the dilution series designated in the Part C Conditions.
- For a WET test failure, a re-test must be performed and submitted. A Toxicity Reduction Evaluation (TRE) will be required if the re-test also fails.
- Statistical evaluation of the WET test results versus the lab control is now required to determine test failures.
- A monitoring requirement for Total Copper and for Hardness has been added.
- A monitoring requirement for TN has been added.
- The TSS and BOD influent monitoring frequency has been increased from twice per month to twice per week.
-Extra decimal places have been added for some limits due to new DEP software.

Other changes include……

-Standard language used in all NPDES permits.


Kutztown_FS_Attach1.pdf


Kutztown_FS_Attach2.pdf


Kutztown_FS_Attach3.pdf

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, as needed. Instantaneous Maximum (IMAX) limits are generally determined using multipliers of 2 (sewage) or 2.5 (industrial). 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	Weekly Average	Instantaneous Minimum	Average Monthly	Weekly Average	Instant. Maximum		
Flow (MGD)	Report	Report Daily Max	XXX	XXX	XXX	XXX	Continuous	Measured
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
UV Intensity (uW/cm²)	XXX	XXX	Report	XXX	XXX	XXX	1/day	Measured
TRC	XXX	XXX	XXX	0.13	XXX	0.41	1/day	Grab
CBOD5 Nov 1 - Apr 30	313	501	XXX	25.0	40.0	50	2/week	24-Hr Composite
CBOD5 May 1 - Oct 31	181	273	XXX	14.5	21.8	29	2/week	24-Hr Composite
BOD5 Raw Sewage Influent	Report	Report Daily Max	XXX	Report	XXX	XXX	2/week	24-Hr Composite
TSS Raw Sewage Influent	Report	Report Daily Max	XXX	Report	XXX	XXX	2/week	24-Hr Composite
TSS	375	563	XXX	30.0	45.0	60	2/week	24-Hr Composite
Total Suspended Solids (lbs)	Report Total Mo	XXX	XXX	XXX	XXX	XXX	1/month	Calculation
Total Suspended Solids (lbs)	XXX	136984 Total Annual	XXX	XXX	XXX	XXX	1/year	Calculation
Total Dissolved Solids	Report	XXX	XXX	1000.0	XXX	2000	1/month	24-Hr Composite
Fecal Coliform (No./100 ml) Oct 1 - Apr 30	XXX	XXX	XXX	2000 Geo Mean	XXX	10000	2/week	Grab

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

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly	Weekly Average	Instantaneous Minimum	Average Monthly	Weekly Average	Instant. Maximum		
Fecal Coliform (No./100 ml) May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	XXX	1000	2/week	Grab
Ammonia Nov 1 - Apr 30	135	XXX	XXX	10.8	XXX	21.6	2/week	24-Hr Composite
Ammonia May 1 - Oct 31	40	XXX	XXX	3.2	XXX	6.4	2/week	24-Hr Composite
Total Phosphorus	Report	XXX	XXX	2.0	XXX	XXX	2/week	24-Hr Composite
Total Phosphorus (lbs)	Report Total Mo	XXX	XXX	XXX	XXX	XXX	1/month	Calculation
Total Phosphorus (lbs)	XXX	4566 Total Annual	XXX	XXX	XXX	XXX	1/year	Calculation
Total Nitrogen	XXX	XXX	XXX	XXX	Report Daily Max	XXX	1/month	24-Hr Composite
Total Copper	XXX	XXX	XXX	XXX	Report Daily Max	XXX	1/month	24-Hr Composite
Hardness	XXX	XXX	XXX	XXX	Report Daily Max	XXX	1/month	24-Hr Composite
Chronic Toxicity- Ceriodaphnia dubia - Reproduction (TUc)	XXX	XXX	XXX	XXX	2.0 Daily Maximum	XXX	SEE PERMIT, Part C	24-Hr Composite

Compliance Sampling Location: at discharge from facility

Other Comments: See Part C of permit for Whole Effluent Toxicity (WET) test requirements.

Tools and References Used to Develop Permit	
☒	WQM for Windows Model (see Attachment)
☒	PENTOXSD for Windows Model (see Attachment)
☒	TRC Model Spreadsheet (see Attachment)
☐	Temperature Model Spreadsheet
☒	Toxics Screening Analysis 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: Establishing Effluent Limitations for Individual Sewage Permits, Version 1.5
☒	SOP: Whole Effluent Toxicity, Version 1.4