pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Southeast Regional Office
CLEAN WATER PROGRAM

Application Type	**Renewal**	Application No.	**PA0020290**
Facility Type	**Municipal**	APS ID	**993741**
Major / Minor	**Major**	Authorization ID	**1274148**

NPDES PERMIT FACT SHEET
INDIVIDUAL SEWAGE

Applicant and Facility Information

Applicant Name	**Quakertown Borough**	Facility Name	**Quakertown Borough STP**
Applicant Address	35 North Third Street	Facility Address	777 East Broad Street
	Quakertown, PA 18951-1376		Quakertown, PA 18951-1777
Applicant Contact	Scott McElree	Facility Contact	David Erwin
Applicant Phone	(215) 536-5001	Facility Phone	(215) 536-5004
Client ID	79535	Site ID	451140
Ch 94 Load Status	Not Overloaded	Municipality	Richland Township
Connection Status	No Limitations	County	Bucks
Date Application Received	April 26, 2019	EPA Waived?	No
Date Application Accepted		If No, Reason	Major Facility
Purpose of Application	Permit renewal		

Summary of Review

The applicant requests renewal of National Pollutant Discharge Elimination System (NPDES) permit to discharge 3.1 million gallons per day (mgd) and 3.84 mgd (Annual Average Flow) of treated sewage after expansion of the sewage treatment plant into Tohickon Creek.

The wastewater treatment plant currently has a rated hydraulic capacity of 4.0 mgd which will be increased to 5.0 mgd as part of the NPDES permit renewal. The treatment plant serves the Quakertown Borough, Richland Township and Richland Borough. Approximately 50% of the flow comes from the Borough while the other 50% comes from outside. Areas outside of the Borough are serviced and maintained by BCWSA. The Borough has begun considering designs for the major plant upgrades.

The Quakertown Borough STP is significantly impacted by wet weather induced high influent flows. These wet weather flows are normally handled by off-line equalization. Occasionally during extreme storm events, all off-line equalization capacity may be utilized. When that happens, excess water from the final equalization tank flows to the chlorine contact tank and is blended with the treated plant effluent. The Quakertown Borough has implemented High Flow Maintenance Plan (HFMP) to outline procedures to be followed to properly handle, treat and sample these extreme weather flows at the treatment plant.

The treatment plant consists of a comminutor, grit removal, equalization tank, primary treatment (settling) tank, biological treatment unit (trickling filter) including nitrification and settling, tertiary chemical treatment for phosphorus removal (alum), chlorine disinfection tank, and de-chlorination tank. Sludge is digested both aerobically and anaerobically and dewatered using a centrifuge and applied to drying beds. The dewatered biosolids are land-applied as Class B non-exceptional sludge on farms in Berks County, used for mine reclamation in Schuylkill County or hauled to landfill.

Approve	Deny	Signatures	Date
X		Ketan Thaker / Project Manager *Ketan Thaker*	5/4/2020
X		Pravin Patel Pravin C. Patel, P.E. / Environmental Engineer Manager	05/04/2020

Summary of Review

Pretreatment Program: Permittee is required to operate and implement an EPA approved pretreatment program as there are industrial facilities contributing their waste into the sewage treatment plant. There are six industrial users in the system. They are (1) RR Donnelley (2) Neenah Inc. and (3) Lepko Finishing Inc.,

Biomonitoring: The current permit requires permittee to conduct annual Chronic WET tests with dilution series of 23%, 46%, 92%, 96%, and 100% effluent and with 92% facility-specific Target In-Stream Waste Concentration (TIWC). Most of the WET tests results show no toxicity. Annual monitoring for Chronic WET testing will continue for this permit renewal.

Based on the e-DMRs, the discharge is generally in compliance with existing effluent limits. Effluent limits for all the conventional parameters will remain the same in this permit renewal for the current flow of 3.1 MGD. Effluent limits for higher flow of 3.84 MGD are calculated using WQM 7.0 Model. Effluent limit of 25 mg/l for Total Suspended Solids (TSS) for expanded flow of 3.84 mgd in included in the permit. This new TSS limit is calculated by applying BAT of 10 mg/l to additional flow of 0.74 mgd and by keeping the same limit of 30mg/l for existing flow of 3.1 mgd. Therefore, the effluent limit for TSS comes to 25 mg/l for total flow of 3.84 mgd after upgrade and expansion of the STP. Based on effluent data, the STP can meet the new effluent limit of 25 mg/l. Similarly, effluent limit of 20 mg/l for Total Nitrogen is calculated for higher flow after expansion of the STP. Based on the effluent data, it is expected that the STP can meet the effluent limit for Total Nitrogen. Effluent limit for Phosphorus is based on the approved TMDL for nutrients for Lake Nockamixon and has allocated concentration limit of 0.5 mg/l and mass loading of 13 lbs/day for the Quakertown Borough STP. Therefore, we have kept the same effluent limits for both mass and concentration for Phosphorus for higher flow after expansion of the STP.

Monitoring for Aluminum and Cadmium are included in the permit renewal to get more data for these two parameters. Monitoring requirements for Copper will continue in the permit renewal as the most stringent WQBEL from PENTOXSD Model is twice the maximum concentration reported in the renewal application.

Following are effluent limits:

PARAMETER	EFFLUENT LIMITS (AV. MO in mg/l)	BASIS
CBOD5 (5/1 – 10/31)	8.0 / 5.5 *	WQM 7.0 Model
CBOD5 (11/1 – 4/30)	15 / 11 *	WQM 7.0 Model
Ammonia-Nitrogen (5/1 – 10/31)	2 / 1.6 *	WQM 7.0 Model
Ammonia-Nitrogen (11/1 – 4/30)	6 / 4.8 *	WQM 7.0 Model
Total Suspended Solids	30/25 *	25 Pa Code 92a.47 and BAT
pH (S.U.)	6.0 to 9.0 SU	25 Pa Code 92a.47, 95.2
Dissolved Oxygen	6.0	WQM 7.0 Model
Total Dissolved Solids	1000	DRBC
Fecal Coliform (#/100 ml)	200 # /100 ml Geo Mean	25 Pa Code 92a.47
Total Residual Chlorine	0.035 / 0.030 *	TRC Spreadsheet
Total Phosphorus	0.5	TMDL- Lake Nockamixon
Total Nitrogen	20	25 Pa Code 92a.61 & BAT
Chronic Toxicity (TUc)	Report	WET Summery Report
Aluminum, Total	Report	Data Collection
Cadmium, Total	Report	Data collection
Copper, Total	Report	PENTOXSD Model & Data Collection
Sulfate	Report	High TDS and SOP
Chloride	Report	High TDS and SOP
Bromide	Report	High TDS and SOP

* Effluent limits for annual average flow of 3.84 MGD after expansion of the sewage treatment plant.

Summary of Review

See attached WQM Model, PENTOXSD Model and TRC Spreadsheet for current flow of 3.1 MGD.


WQM


Adobe Acrobat Document


TRC

See attached WQM Model, PENTOX Model and TRC Spreadsheet for flow of 3.84 MGD.


WQM Model.pdf


PENTOXSD Model.pdf


TRC Spreadsheet.pdf

Act-14 Notifications to Richland Township and Bucks County on April 15, 2019 by certified mail.

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)	3.1
Latitude	40Âº 26' 33.86"	Longitude	-75Âº 19' 2.39"
Quad Name	Quakertown	Quad Code	
Wastewater Description:	Sewage Effluent		

Receiving Waters	Tohickon Creek (TSF, MF)	Stream Code	03110
NHD Com ID	26053388	RMI	23.37
Drainage Area	22.5 sq miles	Yield (cfs/mi^2)	0.018
Q_{7-10} Flow (cfs)	0.41	Q_{7-10} Basis	
Elevation (ft)		Slope (ft/ft)	
Watershed No.	2-D	Chapter 93 Class.	TSF, MF
Existing Use		Existing Use Qualifier	
Exceptions to Use		Exceptions to Criteria	
Assessment Status	Impaired		
Cause(s) of Impairment	NUTRIENTS, SILTATION		
Source(s) of Impairment	AGRICULTURE, REMOVAL OF RIPARIAN VEGETATION		
TMDL Status		Name	

Background/Ambient Data		Data Source
pH (SU)		
Temperature (°F)		
Hardness (mg/L)		
Other:		

Nearest Downstream Public Water Supply Intake			
PWS Waters		Flow at Intake (cfs)	
PWS RMI		Distance from Outfall (mi)	

Treatment Facility Summary				
Treatment Facility Name: Quakertown Borough STP				
Waste Type	**Degree of Treatment**	**Process Type**	**Disinfection**	**Avg Annual Flow (MGD)**
Sewage	Secondary	Trickling Filter With Settling	Gas Chlorine	3.15
Hydraulic Capacity (MGD)	**Organic Capacity (lbs/day)**	**Load Status**	**Biosolids Treatment**	**Biosolids Use/Disposal**
4	6670	Not Overloaded		

Compliance History

DMR Data for Outfall 001 (from January 1, 2019 to December 31, 2019)

Parameter	DEC-19	NOV-19	OCT-19	SEP-19	AUG-19	JUL-19	JUN-19	MAY-19	APR-19	MAR-19	FEB-19	JAN-19
Flow (MGD) Average Monthly	3.259	2.542	2.333	1.736	1.878	2.911	2.972	3.757	2.798	3.572	3.27	3.291
Flow (MGD) Weekly Average	3.91	3.049	4.368	1.905	2.189	3.48	4.293	5.14	3.471	4.633	3.468	4.508
pH (S.U.) Minimum	6.83	6.77	6.91	7.01	6.58	6.69	6.92	6.82	6.68	6.84	6.67	6.78
pH (S.U.) Maximum	7.36	7.45	7.41	7.39	7.41	7.63	7.39	7.42	7.41	7.59	7.51	7.58
DO (mg/L) Minimum	9.1	7.9	7.8	7.5	7.3	7.4	7.7	8.2	8.4	8.6	9.2	9.1
TRC (mg/L) Average Monthly	< 0.014	< 0.013	< 0.011	0.011	0.011	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
TRC (mg/L) Instantaneous Maximum	0.049	0.059	0.022	0.019	0.027	< 0.010	< 0.010	< 0.010	0.019	< 0.010	0.024	< 0.010
CBOD5 (lbs/day) Average Monthly	< 100	< 67	< 45	< 30	< 31	< 52	93	< 90	< 42	< 62	< 64	148
CBOD5 (lbs/day) Influent Average Monthly	5360	4767	3888	3828	2831	3368	4893	3209	3556	3512	3374	2536
CBOD5 (lbs/day) Weekly Average	215	< 63	< 70	< 34	< 35	< 73	188	< 116	< 51	< 76	< 85	403
CBOD5 (mg/L) Average Monthly	< 3.0	< 2	< 2	< 2.0	< 2	< 2	< 3	< 2	< 2.0	< 2.0	< 2.0	< 3.0
CBOD5 (mg/L) Influent Average Monthly	197	236	222	250	183	161	188	110	175	130	125	100
CBOD5 (mg/L) Weekly Average	6.0	< 2	< 2	< 2.0	< 2	< 2	5.7	< 3	< 2.0	< 2.0	< 4.0	16
BOD5 (lbs/day) Influent Average Monthly	8067	5832	5953	4302	3929	4808	5950	5083	3880	3481	3732	4823
BOD5 (mg/L) Influent Average Monthly	256	272	428	278	278	193	180	112	232	118	169	229

TSS (lbs/day) Average Monthly	357	< 118	< 360	< 78	75	245	362	368	< 168	377	274	471
TSS (lbs/day) Influent Average Monthly	7837	7705	8209	10620	7204	10215	9459	7255	8490	6435	6656	8094
TSS (lbs/day) Weekly Average	515	155	1053	86	110	289	638	566	174	489	324	739
TSS (mg/L) Average Monthly	12	< 5	< 11	< 5	5	10	10	10	< 8	12	10	15
TSS (mg/L) Influent Average Monthly	299	427	464	688	460	441	369	253	427	239	262	344
TSS (mg/L) Weekly Average	15	6	25	6	7	15	13	12	10	14	13	22
Total Dissolved Solids (mg/L) Daily Maximum	895			992			664			650		
Fecal Coliform (CFU/100 ml) Geometric Mean	< 4	< 7	< 2	< 3	2	7	52	< 51	< 3.0	< 2	5	< 37
Fecal Coliform (CFU/100 ml) Instantaneous Maximum	12.2	980.4	20.9	8.6	16	218.7	960.6	920.8	10.8	17.3	25.6	488.4
Total Nitrogen (lbs/day) Average Monthly				381	269	456	372	450				
Total Nitrogen (mg/L) Average Monthly				21.1	18.8	16.63	18.9	15.3				
Ammonia (lbs/day) Average Monthly	7	< 7	< 9	< 4	4	< 8	70	12	< 5	< 9	< 12	< 13
Ammonia (mg/L) Average Monthly	< 0.25	< 0.27	< 0.35	< 0.25	< 0.25	< 0.3	< 1.14	0.30	< 0.25	< 0.27	< 0.41	< 0.37
Nitrate (lbs/day) Average Monthly				334	256	411	370	15.3				
Nitrate (mg/L) Average Monthly				18.5	17.9	15	18.8	450				
Total Phosphorus (lbs/day) Average Monthly	13	11	14	6	7	13	16	17	8	16	8	13
Total Phosphorus (mg/L) Average Monthly	0.45	0.40	0.51	0.37	0.44	0.48	0.46	0.44	0.41	0.46	0.30	0.41

Total Copper (mg/L) Daily Maximum	0.0104			0.0113			0.008			0.0151		
Sulfate (mg/L) Daily Maximum	123			125			89			74.2		
Chloride (mg/L) Daily Maximum	287			330			225			250		
Bromide (mg/L) Daily Maximum	0.155			2			< 0.4			< 0.6000		

Permit No. PA0020290

WET Summary and Evaluation

Facility Name	Quakertown Borough STP
Permit No.	PA0020290
Design Flow (MGD)	3.1
Q_{7-10} Flow (cfs)	0.41
PMF_a	1
PMF_c	1

		Test Results (Pass/Fail)			
		Test Date	Test Date	Test Date	Test Date
Species	**Endpoint**	8/17/15	10/31/16	11/7/17	11/13/18
Ceriodaphnia	Survival	Pass	Pass	Pass	Pass

		Test Results (Pass/Fail)			
		Test Date	Test Date	Test Date	Test Date
Species	**Endpoint**	8/17/15	10/31/16	11/7/17	11/13/18
Ceriodaphnia	Reproduction	Pass	Pass	Pass	Pass

		Test Results (Pass/Fail)			
		Test Date	Test Date	Test Date	Test Date
Species	**Endpoint**	7/21/15	11/1/16	11/7/17	11/13/18
Pimephales	Survival	Pass	Pass	Pass	Pass

		Test Results (Pass/Fail)			
		Test Date	Test Date	Test Date	Test Date
Species	**Endpoint**	7/21/15	11/1/16	11/7/17	11/13/18
Pimephales	Growth	Pass	Pass	Pass	Pass

Reasonable Potential? NO

Permit Recommendations

Test Type	Chronic
TIWC	92 % Effluent
Dilution Series	23, 46, 92, 96, 100 % Effluent
Permit Limit	None
Permit Limit Species	

Proposed Effluent Limitations and Monitoring Requirements

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

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

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly	Average Weekly	Minimum	Average Monthly	Daily Maximum	Instant. Maximum		
Flow (MGD)	Report	Report Wkly Avg	XXX	XXX	XXX	XXX	Continuous	Recorded
pH (S.U.)	XXX	XXX	6.0 Inst Min	XXX	XXX	9.0	1/day	Grab
DO	XXX	XXX	6.0 Inst Min	XXX	XXX	XXX	1/day	Grab
CBOD5 Raw Sewage Influent	Report	XXX	XXX	Report	XXX	XXX	2/week	24-Hr Composite
BOD5 Raw Sewage Influent	Report	XXX	XXX	Report	XXX	XXX	2/week	24-Hr Composite
TSS Raw Sewage Influent	Report	XXX	XXX	Report	XXX	XXX	2/week	24-Hr Composite
Total Dissolved Solids	XXX	XXX	XXX	1000.0 Avg Qrtly	2000.0	2500	1/quarter	24-Hr Composite
Total Phosphorus	13.0	XXX	XXX	0.5	XXX	1	2/week	24-Hr Composite
Total Aluminum	XXX	XXX	XXX	Report	Report	XXX	1/month	24-Hr Composite
Total Cadmium	XXX	XXX	XXX	Report	Report	XXX	1/month	24-Hr Composite
Total Copper	XXX	XXX	XXX	Report	Report	XXX	1/month	24-Hr Composite
Sulfate	XXX	XXX	XXX	XXX	Report	XXX	1/quarter	24-Hr Composite
Chloride	XXX	XXX	XXX	XXX	Report	XXX	1/quarter	24-Hr Composite
Bromide	XXX	XXX	XXX	XXX	Report	XXX	1/quarter	24-Hr Composite

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

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly	Average Weekly	Minimum	Average Monthly	Daily Maximum	Instant. Maximum		
Fecal Coliform (No./100 ml)	XXX	XXX	XXX	200 Geo Mean	XXX	1000	2/week	Grab
Chronic WET - Ceriodaphnia Survival (TUc)	XXX	XXX	XXX	XXX	Report	XXX	See Permit	24-Hr Composite
Chronic WET - Ceriodaphnia Reproduction (TUc)	XXX	XXX	XXX	XXX	Report	XXX	See Permit	24-Hr Composite
Chronic WET - Pimephales Survival (TUc)	XXX	XXX	XXX	XXX	Report	XXX	See Permit	24-Hr Composite
Chronic WET - Pimephales Growth (TUc)	XXX	XXX	XXX	XXX	Report	XXX	See Permit	24-Hr Composite

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: Start of Final Period 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	Minimum	Average Monthly	Weekly Average	Instant. Maximum		
TRC	XXX	XXX	XXX	0.030	XXX	0.054	1/day	Grab
CBOD5 Nov 1 - Apr 30	352.0	528.0	XXX	11.0	16.5	22	2/week	24-Hr Composite
CBOD5 May 1 - Oct 31	176.0	264.0	XXX	5.5	8.25	11	2/week	24-Hr Composite
TSS	800	1200	XXX	25.0	37.5	50.0	2/week	24-Hr Composite
Ammonia Nov 1 - Apr 30	154.0	XXX	XXX	4.8	XXX	9.6	2/week	24-Hr Composite
Ammonia May 1 - Oct 31	51.0	XXX	XXX	1.6	XXX	3.2	2/week	24-Hr Composite
Total Nitrogen	641	XXX	XXX	20	XXX	40	1/month	24-Hr Composite

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 End of Interim Period 1.

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly	Weekly Average	Minimum	Average Monthly	Weekly Average	Instant. Maximum		
TRC	XXX	XXX	XXX	0.035	XXX	0.063	1/day	Grab
CBOD5 Nov 1 - Apr 30	388.0	595.0	XXX	15.0	23.0	30	2/week	24-Hr Composite
CBOD5 May 1 - Oct 31	207.0	310.0	XXX	8.0	12.0	16	2/week	24-Hr Composite
TSS	776.0	1163.0	XXX	30.0	45.0	60	2/week	24-Hr Composite
Ammonia Nov 1 - Apr 30	155.0	XXX	XXX	6.0	XXX	12	2/week	24-Hr Composite
Ammonia May 1 - Oct 31	52.0	XXX	XXX	2.0	XXX	4	2/week	24-Hr Composite
Total Nitrogen	517	XXX	XXX	20	XXX	40	1/month	24-Hr Composite

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.

Monitoring Point MP 101, Effective Period: Permit Effective Date through Permit Expiration Date.

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly	Average Weekly	Minimum	Average Monthly	Daily Maximum	Instant. Maximum		
pH (S.U.)	XXX	XXX	XXX	XXX	Report	XXX	1/year	Grab
CBOD5	XXX	XXX	XXX	XXX	Report	XXX	1/year	Grab
COD	XXX	XXX	XXX	XXX	Report	XXX	1/year	Grab
TSS	XXX	XXX	XXX	XXX	Report	XXX	1/year	Grab
Oil and Grease	XXX	XXX	XXX	XXX	Report	XXX	1/year	Grab
TKN	XXX	XXX	XXX	XXX	Report	XXX	1/year	Grab
Total Phosphorus	XXX	XXX	XXX	XXX	Report	XXX	1/year	Grab
Dissolved Iron	XXX	XXX	XXX	XXX	Report	XXX	1/year	Grab