pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Southcentral Regional Office
CLEAN WATER PROGRAM

NPDES PERMIT FACT SHEET INDIVIDUAL SEWAGE

Application Type	**Renewal**	Application No.	**PA0022209**
Facility Type	**Municipal**	APS ID	**27956**
Major / Minor	**Major**	Authorization ID	**1301146**

Applicant and Facility Information

Applicant Name	**Municipal Authority of the Borough Bedford of Borough**	Facility Name	**Bedford Borough STP**
Applicant Address	244 W Penn Street	Facility Address	653 East John Street Ext
	Bedford, PA 15522-1226		Bedford, PA 15522
Applicant Contact	Barbara Diehl	Facility Contact	John Flick
Applicant Phone	(814) 623-8192	Facility Phone	(814) 623-6070
Client ID	34446	Site ID	451975
Ch 94 Load Status	Not Overloaded	Municipality	Bedford Borough
Connection Status	No Limitations	County	Bedford
Date Application Received	December 23, 2019	EPA Waived?	No
Date Application Accepted	January 13, 2020	If No, Reason	Major Facility, Significant CB Discharge
Purpose of Application	This is an application for NPDES renewal.		

Summary of Review

Approve	Deny	Signatures	Date
X		Nicholas Hong, P.E. / Environmental Engineer Nick Hong (via electronic signature)	December 29, 2020
		Daniel W. Martin, P.E. / Environmental Engineer Manager	
		Maria Bebenek, P.E. / Environmental Program Manager	

Summary of Review

The application submitted by the applicant requests a NPDES renewal permit for the Municipal Authority of the Borough of Bedford located at 653 East John Street Ext, Bedford, PA 15522 in Bedford County, municipality of Bedford. The existing permit became effective on August 1, 2015 and expired on July 31, 2020. The application for renewal was received by DEP Southcentral Regional Office (SCRO) on December 23, 2019.

The purpose of this Fact Sheet is to present the basis of information used for establishing the proposed NPDES permit effluent limitations. The Fact Sheet includes a description of the facility, a description of the facility's receiving waters, a description of the facility's receiving waters attainment/non-attainment assessment status, and a description of any changes to the proposed monitoring/sampling frequency. Section 6 provides the justification for the proposed NPDES effluent limits derived from technology based effluent limits (TBEL), water quality based effluent limits (WQBEL), total maximum daily loading (TMDL), antidegradation, anti-backsliding, and/or whole effluent toxicity (WET). A brief summary of the outlined descriptions has been included in the Summary of Review section.

The subject facility is a 1.5 MGD treatment facility. The applicant does not anticipate any proposed upgrades to the treatment facility in the next five years. The NPDES application has been processed as a Major Sewage Facility with CSO due to the type of sewage and the design flow rate for the facility. The applicant disclosed the Act 14 requirement to Bedford County Commissioners, Bedford Township Supervisors, and Bedford Borough Council and the notice was received by the parties on approximately October 7, 2019. A planning approval letter was not necessary as the facility is neither new or expanding.

Utilizing the DEP's web-based Emap-PA information system, the receiving waters has been determined to be the Raystown Juniata Branch River. The sequence of receiving streams that the Raystown Branch Juniata River discharges into are the Juniata River and the Susquehanna River which eventually drains into the Chesapeake Bay. The subject site is subject to the Chesapeake Bay implementation requirements. The receiving water has protected water usage for trout stocking fishes (TSF) and migratory fishes (MF). No Class A Wild Trout fisheries are impacted by this discharge. The absence of high quality and/or exceptional value surface waters removes the need for an additional evaluation of anti-degradation requirements.

The Raystown Branch Juniata River is a Category 2 stream listed in the 2020 Integrated List of All Waters (formerly 303d Listed Streams). This stream is an attaining stream that supports aquatic life. The receiving waters is not subject to a total maximum daily load (TMDL) plan to improve water quality in the subject facility's watershed.

The existing permit and proposed permit differ as follows:

- **Ammonia-nitrogen effluent limits have been reduced to 7.0 mg/l as an average monthly.**
- **Monitoring for total cadmium and total zinc shall be on a 1x/mo basis.**

The proposed permit will expire five (5) years from the effective date.

Based on the review in this report, it is recommended that the permit be drafted. 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.

Any additional information or public review of documents associated with the discharge or facility may be available at PA DEP Southcentral Regional Office (SCRO), 909 Elmerton Avenue, Harrisburg, PA 17110. To make an appointment for file review, contact the SCRO File Review Coordinator at 717.705.4700.

1.0 Applicant

1.1 General Information

This fact sheet summarizes PA Department of Environmental Protection's review for the NPDES renewal for the following subject facility.

Facility Name: Municipal Authority of the Borough of Borough

NPDES Permit # PA0022209

Physical Address: 653 East John Street Ext
Bedford, PA 15522

Mailing Address: 244 West Penn Street
Bedford, PA 15522

Contact: John Flick
WWTP Superintendent
bedwwtp@bedboro.com

Consultant: Tobias Nagle
Sr. Environmental Scientist
Stiffler-McGraw Associates
814 696 6280 ext 349
tnagle@stiffler-mcgraw.com

1.2 Permit History

Description of Facility

On January 26, 2015, the facility entered into a Consent Order and Agreement (COA). The COA outlined a timetable for elimination of CSO 002.

The following table summarizes the achieved and anticipated milestones.

Milestone	Completion Date
Submit I/I investigation plan	**03/17/2015**
Submit Remediation Plan	**08/19/2016**
The last remaining CSO (Outfall CSO002) is anticipated to be separated by December 31, 2022.	**12/31/2022**

At the time the application was submitted, the applicant was undertaking a major sewer replacement and stormwater separation project that would result in the elimination of the remaining combined sewer areas of the collection system. Substantial completion of the project is to be accomplished by mid-summer of 2020 at which time the system will be 100% separated.

A telephone conversation with John Flick occurred on December 2, 2020. Mr. Flick projected that the last remaining CSO would be separated by December 2022 as stipulated by the COA.

Permit submittal included the following information.

- NPDES Application
- Service Area Map
- WWTP Site Plan
- WWTP Stormwater System Site Plan

- WWTP and Stormwater Outfall Information / WWTP Stormwater BMP
- Receiving Stream Hardness
- Treatment Plant Process Information / Flow Diagrams
- Previous 12 Months – CSO Events Summary Spreadsheet & Supplemental CSO Info
- Industrial User Information
- WET Testing Data

2.0 Treatment Facility Summary

2.1.1 Site location

The physical address for the facility is 653 East John Street Ext, Bedford, PA 15522. A topographical and an aerial photograph of the facility are depicted as Figure 1 and Figure 2.

Figure 1: Topographical map of the subject facility

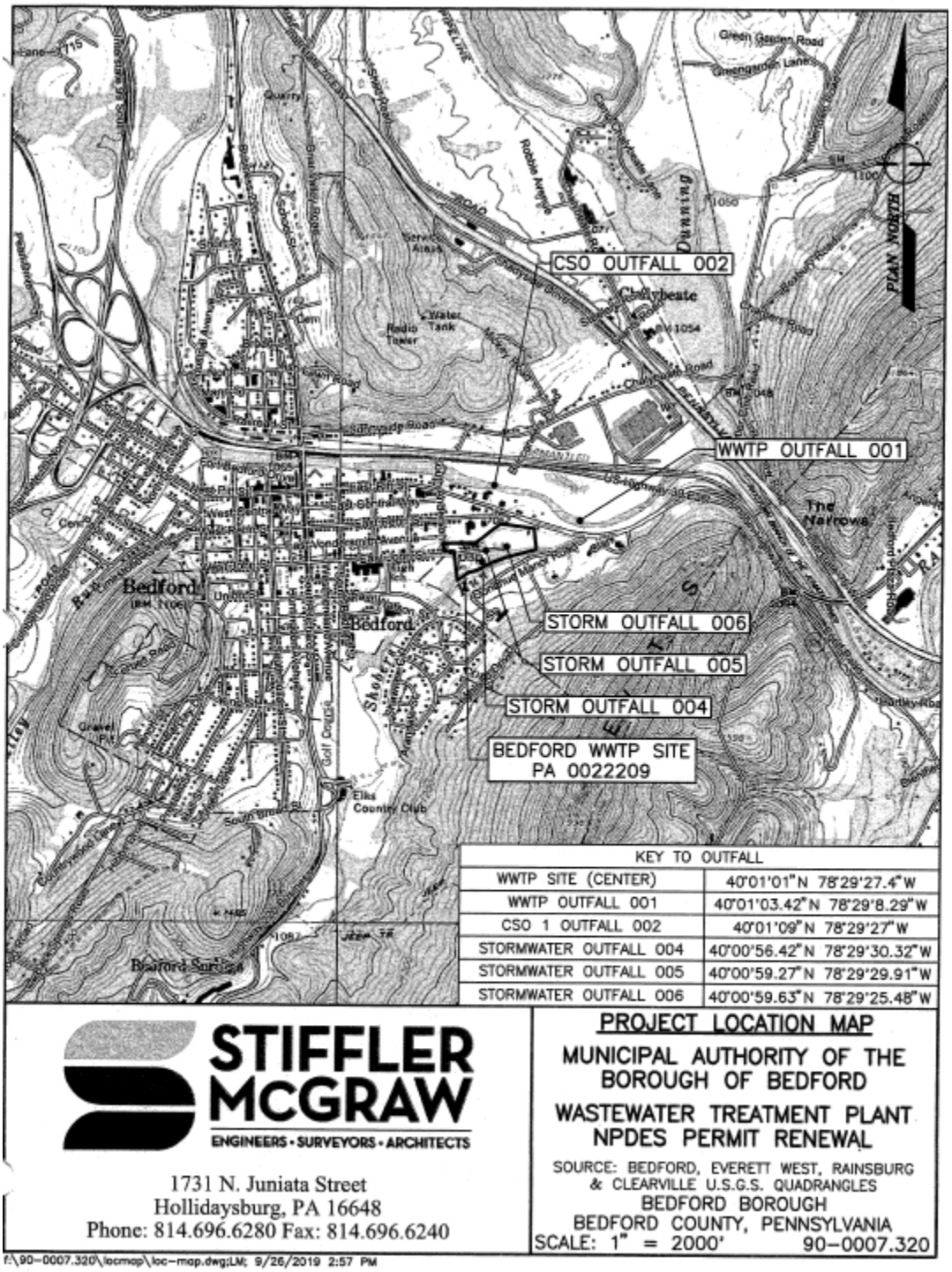
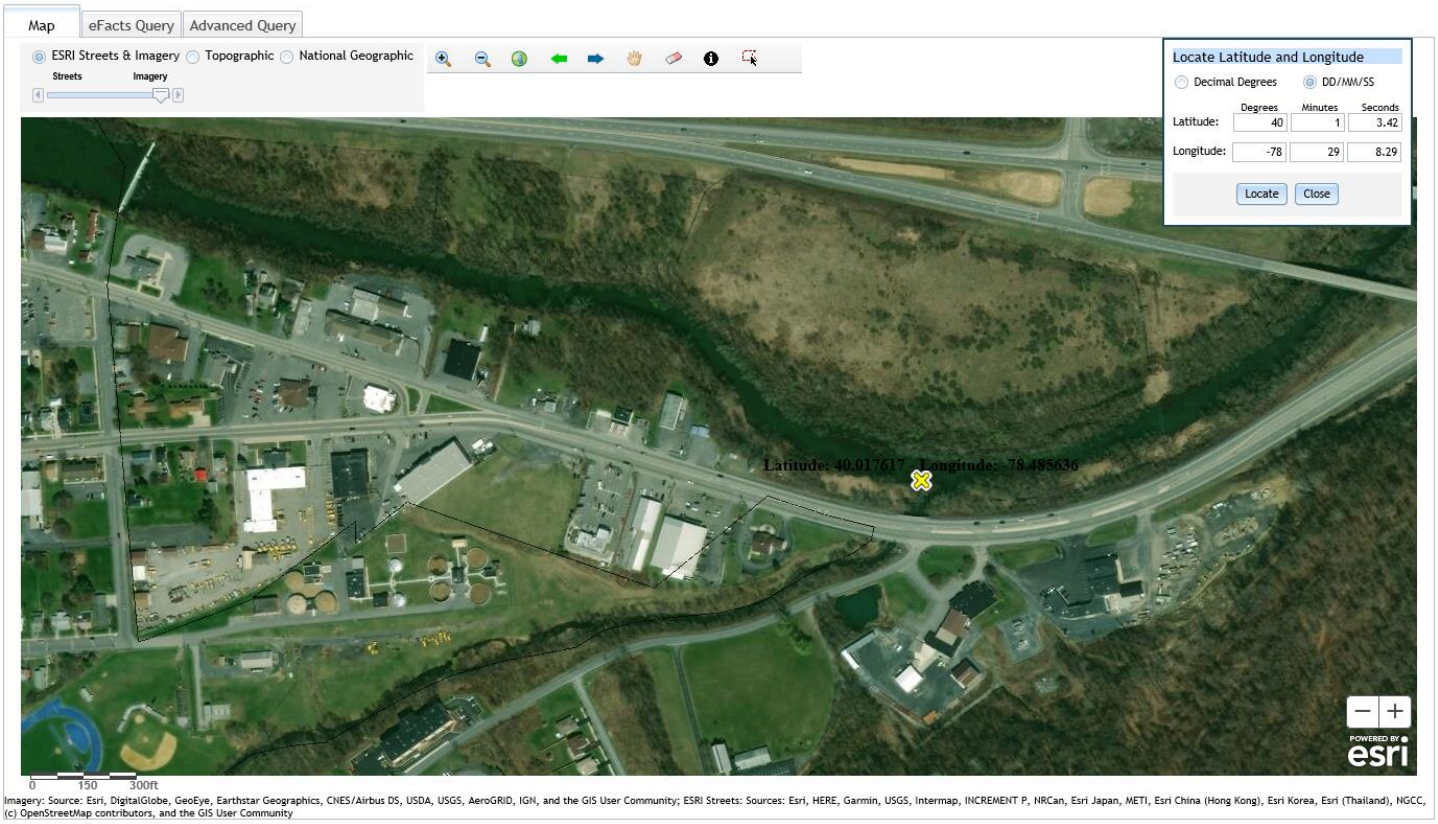


Figure 2: Aerial Photograph of the subject facility



2.1.2 Sources of Wastewater/Stormwater

The WWTP serves two municipalities. Bedford Borough contributes 31% of the flow from an estimated population of 2,888 persons. Bedford Township contributes 69% of the flow from an estimated population of 2,930 persons.

The facility did not have any hauled-in waste contributions.

The facility is currently in the process of developing a formal Industrial Pretreatment Program to be implemented and administered by the Municipality Authority of Bedford Borough under the Federal pretreatment guidelines promulgated by US EPA. As outlined by communication from EPA (Philadelphia Branch), the permit will include requirements for pretreatment. The following is a list of facilities that were identified as indirect dischargers and were being considered for inclusion in the pretreatment program. The facilities in the table require a pretreatment permit. Facilities that do not require a pretreatment permit have not been listed in the summary table.

Industrial User Customer List	
BTMA Industrial Discharge Customer	Wal-Mart
	Rex Heat Treat
	JLG (Weber Lane)
	Kennametal Inc.
MABB Industrial Customer	Defiance Metal Products
	Penndot
	Bedford Burn Off Services, Inc.
	JLG (Sunnyside)
	Quick N Easy Car Wash

The facility has 3 stormwater outfalls named Outfall 004, 005, and 006. They all discharge to Shobers Run which is a HQ-CWF and migratory fish receiving stream.

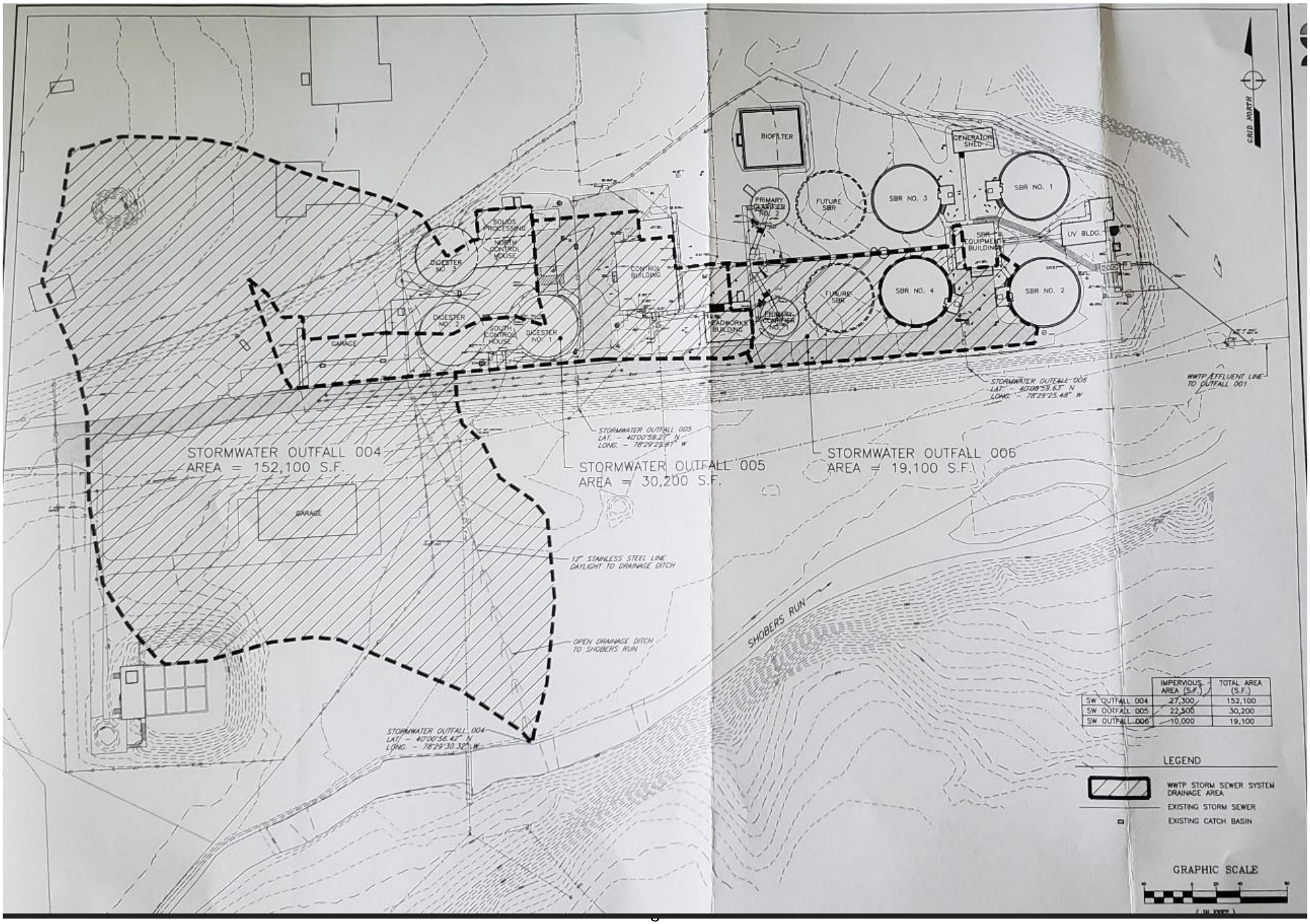
An itemized list of the facility's Stormwater BMP and Non-Structural Controls was included in the NPDES renewal application.

The facility has the following outfall information for stormwater.

- Outfall 004 serves a drainage area of approximately 152,100 ft^2 which includes an impervious area of 27,300 ft^2.
- Outfall 005 serves a drainage area of approximately 30,200 ft^2 which includes an impervious area of 22,500 ft^2.
- Outfall 006 serves a drainage area of approximately 19,100 ft^2 which includes an impervious area of 10,000 ft^2.

Outfalls 4 and 5 discharge to the ground outside the plant perimeter fence. Any stormwater flows discharged from these two outfalls sheet flow across vacant, unimproved vegetated ground approximately 140 and 275 feet respectively to reach Shobers Run.

The figure illustrates the stormwater drainage areas and outfall locations.


STORMWATER OUTFALL 004
AREA = 152,100 S.F.
STORMWATER OUTFALL 005
AREA = 30,200 S.F.
STORMWATER OUTFALL 006
AREA = 19,100 S.F.
STORMWATER OUTFALL 004
LAT. = 40°00'56.42" N
LONG. = 78°29'30.32" W
STORMWATER OUTFALL 005
LAT. = 40°00'59.27" N
LONG. = 78°29'23.91" W
STORMWATER OUTFALL 006
LAT. = 40°00'59.63" N
LONG. = 78°29'25.48" W
12" STAINLESS STEEL LINE DAYLIGHT TO DRAINAGE DITCH
OPEN DRAINAGE DITCH TO SHOBERS RUN
SHOBERS RUN
WWTP EFFLUENT LINE TO OUTFALL 001
BIOFILTER
GENERATOR SHED
SBR NO. 1
SBR NO. 2
SBR NO. 3
SBR NO. 4
FUTURE SBR
FUTURE SBR
SBR EQUIPMENT BUILDING
UV BLDG
PRIMARY CLARIFIER NO. 2
PRIMARY CLARIFIER NO. 1
HEADWORKS BUILDING
CONTROL BUILDING
SOLIDS PROCESSING
NORTH CONTROL HOUSE
SOUTH CONTROL HOUSE
DIGESTER NO. 3
DIGESTER NO. 2
DIGESTER NO. 1
GARAGE
GARAGE
GRID NORTH
IMPERVIOUS AREA (S.F.)
TOTAL AREA (S.F.)
SW OUTFALL 004 27,300 152,100
SW OUTFALL 005 22,500 30,200
SW OUTFALL 006 10,000 19,100
LEGEND
WWTP STORM SEWER SYSTEM DRAINAGE AREA
EXISTING STORM SEWER
EXISTING CATCH BASIN
GRAPHIC SCALE

2.2 Description of Wastewater Treatment Process

The subject facility is a 1.5 MGD design flow facility. The subject facility treats wastewater using a primary clarifier(s), a SBR(s), an anaerobic digester(s), a bio-filter for odor control, and a UV unit prior to discharge through the outfall.

The SBR was part of the upgrade to the treatment plant in December 2011.

Total nitrogen reduction is provided by a biological process. The SBR control system is programmed to cycle periods of aerobic and anoxic conditions within the SBR tanks during the react period to facilitate nitrification and denitrification.

Total phosphorus reduction is provided through a combination of biological and chemical processes. For the biological processes, a portion of the phosphorus is taken up by the activated sludge biomass during the aerobic cycle that follows the anoxic cycles of the react period in the SBR tanks. The chemical removal processes involve the addition of metal salts (ferrous sulfate) to the splitter box immediately ahead of the primary settling tanks to enhance the precipitation of dissolved phosphorus in the effluent during the primary settling period. The precipitate is settled out and wasted to the anaerobic digesters.

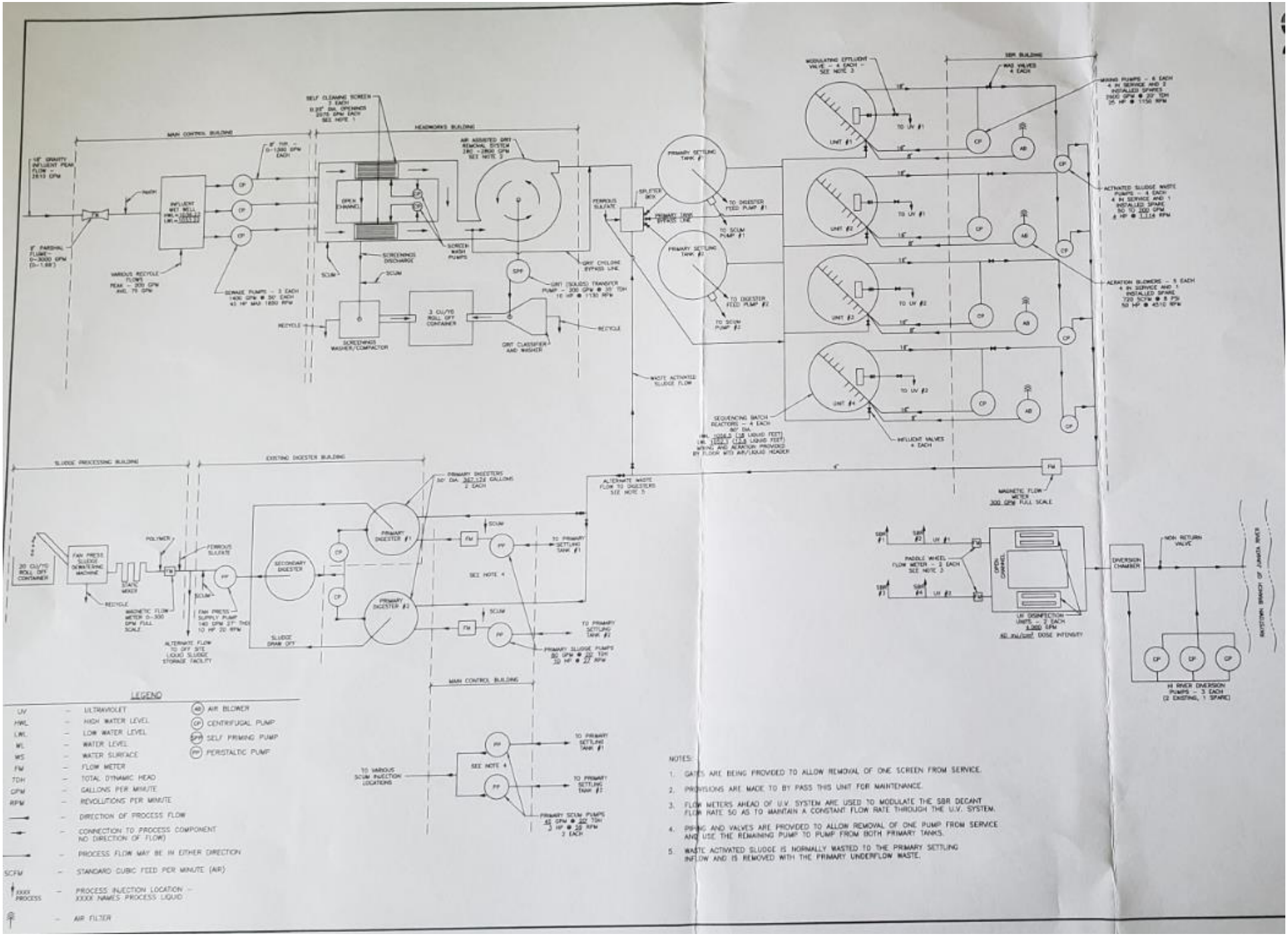
Three, heated, anerobic digesters provide digestion and stabilization of sludge settled in the primary clarifier. Two of the digesters are utilized as primary digesters and the third is utilized as a secondary digester. Gas generated by the digesters is used by a gas fired boiler and circulation system to heat sludge to accelerate and enhance digestion.

The facility is being evaluated for flow, pH, dissolved oxygen, CBOD5, TSS, fecal coliform, ammonia-nitrogen, phosphorus, Total Copper, and UV dosage. The existing permits limits for the facility is summarized in Section 2.4.

The treatment process is summarized in the table.

Treatment Facility Summary				
Treatment Facility Name: Bedford STP				
Waste Type	**Degree of Treatment**	**Process Type**	**Disinfection**	**Avg Annual Flow (MGD)**
Sewage	Secondary With Phosphorus Reduction	Activated Sludge	UV	1.5
Hydraulic Capacity (MGD)	**Organic Capacity (lbs/day)**	**Load Status**	**Biosolids Treatment**	**Biosolids Use/Disposal**
1.5	3000	Not Overloaded	Aerobic Digestion	Combination of methods

A flow diagram of the treatment process is shown.


MAIN CONTROL BUILDING
HEADWORKS BUILDING
SBR BUILDING
SLUDGE PROCESSING BUILDING
EXISTING DIGESTER BUILDING
SELF CLEANING SCREEN
AIR ASSISTED GRIT REMOVAL SYSTEM
PRIMARY SETTLING TANK #1
PRIMARY SETTLING TANK #2
SEQUENCING BATCH REACTORS
MAGNETIC FLOW METER
300 GPM FULL SCALE
PRIMARY DIGESTERS
SECONDARY DIGESTER
UV DISINFECTION UNITS
DIVERSION CHAMBER
NON RETURN VALVE
LEGEND
NOTES:
1. GATES ARE BEING PROVIDED TO ALLOW REMOVAL OF ONE SCREEN FROM SERVICE.
2. PROVISIONS ARE MADE TO BY PASS THIS UNIT FOR MAINTENANCE.
3. FLOW METERS AHEAD OF U.V. SYSTEM ARE USED TO MODULATE THE SBR DECANT FLOW RATE SO AS TO MAINTAIN A CONSTANT FLOW RATE THROUGH THE U.V. SYSTEM.
4. PIPING AND VALVES ARE PROVIDED TO ALLOW REMOVAL OF ONE PUMP FROM SERVICE AND USE THE REMAINING PUMP TO PUMP FROM BOTH PRIMARY TANKS.
5. WASTE ACTIVATED SLUDGE IS NORMALLY WASTED TO THE PRIMARY SETTLING INFLOW AND IS REMOVED WITH THE PRIMARY UNDERFLOW WASTE.

2.3 Facility Outfall Information

The facility has the following outfall information for wastewater.

Outfall No.	001	**Design Flow (MGD)**	1.5
Latitude	40º 1' 3.43"	**Longitude**	-78º 29' 8.30"
Wastewater Description:	Effluent		

The subject facility outfall is within the vicinity of another sewage/wastewater outfall. A downstream outfall is the Snake Spring Municipal Authority WWTP.

Outfall No.	002	**Design Flow (MGD)**	1.5
Latitude	40º 1' 9"	**Longitude**	-78º 29' 27"
Wastewater Description:	CSO		

The nine minimum controls (NMCs) plan and the long-term control plan (LTCP) were approved by DEP on September 24, 2004.

2.3.1 Operational Considerations- Chemical Additives

Chemical additives are chemical products introduced into a waste stream that is used for cleaning, disinfecting, or maintenance and which may be detected in effluent discharged to waters of the Commonwealth. Chemicals excluded are those used for neutralization of waste streams, the production of goods, and treatment of wastewater.

The subject facility utilizes the following chemicals as part of their treatment process.

- Ferrous sulfate for precipitation of phosphorus
- Sodium hydroxide for alkalinity adjustment for nutrient reduction
- Ferrous Sulfate for sludge dewatering aid
- Pollutech CL21 Polymer for sludge dewatering aid
- Sodium Hypochlorite for periodic filamentous control as needed

2.4 Existing NPDES Permits Limits

The existing NPDES permit limits are summarized in the table.

PART A - EFFLUENT LIMITATIONS, MONITORING, RECORDKEEPING AND REPORTING REQUIREMENTS

I. A. For Outfall 001 , **Latitude** 40° 1' 3.42" , **Longitude** 78° 29' 8.29" , **River Mile Index** 94.8 , **Stream Code** 13349

Receiving Waters: Raystown Branch Juniata River

Type of Effluent: Treated Sewage

1. The permittee is authorized to discharge during the period from August 1, 2015 through July 31, 2020.
2. Based on the anticipated wastewater characteristics and flows described in the permit application and its supporting documents and/or amendments, the following effluent limitations and monitoring requirements apply (see also Additional Requirements and Footnotes).

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2)	Required
	Average Monthly	Daily Maximum	Minimum	Average Monthly	Weekly Average	Instant. Maximum	Measurement Frequency	Sample Type
Flow (MGD)	Report	Report	XXX	XXX	XXX	XXX	Continuous	Measured
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
CBOD5	250	400 Wkly Avg	XXX	20	32	40	2/week	24-Hr Composite
BOD5 Raw Sewage Influent	Report	Report	XXX	Report	XXX	XXX	2/week	24-Hr Composite
Total Suspended Solids Raw Sewage Influent	Report	Report	XXX	Report	XXX	XXX	2/week	24-Hr Composite
Total Suspended Solids	375	563 Wkly Avg	XXX	30	45	60	2/week	24-Hr Composite
Fecal Coliform (CFU/100 ml) May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	XXX	1,000	2/week	Grab
Fecal Coliform (CFU/100 ml) Oct 1 - Apr 30	XXX	XXX	XXX	2,000 Geo Mean	XXX	10,000	2/week	Grab

Outfall 001, Continued (from August 1, 2015 through July 31, 2020)

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2)	Required
	Average Monthly	Daily Maximum	Minimum	Average Monthly	Weekly Average	Instant. Maximum	Measurement Frequency	Sample Type
Ammonia-Nitrogen May 1 - Oct 31	94	XXX	XXX	7.5	XXX	15	2/week	24-Hr Composite
Ammonia-Nitrogen Nov 1 - Apr 30	Report	XXX	XXX	Report	XXX	XXX	2/week	24-Hr Composite
Total Phosphorus	25	XXX	XXX	2.0	XXX	4.0	2/week	24-Hr Composite
Total Copper	Report	XXX	XXX	Report	XXX	XXX	2/month	24-Hr Composite
UV Dosage (mjoules/cm²)	XXX	XXX	Report	XXX	XXX	XXX	1/day	Recorded

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s): at Outfall 001

PART A - EFFLUENT LIMITATIONS, MONITORING, RECORDKEEPING AND REPORTING REQUIREMENTS

I. C. For Outfall 001 , **Latitude** 40° 1' 3.42" , **Longitude** 78° 29' 8.29" , **River Mile Index** 94.8 , **Stream Code** 13349

Receiving Waters: Raystown Branch Juniata River

Type of Effluent: Treated Sewage

1. The permittee is authorized to discharge during the period from August 1, 2015 through July 31, 2020.

2. Based on the anticipated wastewater characteristics and flows described in the permit application and its supporting documents and/or amendments, the following effluent limitations and monitoring requirements apply (see also Additional Requirements and Footnotes).

Parameter [1] [4]	Effluent Limitations					Monitoring Requirements	
	Mass Units (lbs)		Concentrations (mg/L)			Minimum [2] Measurement Frequency	Required Sample Type
	Monthly	Annual	Minimum	Monthly Average	Maximum		
Ammonia---N	Report	Report	XXX	Report	XXX	2/week	24-Hr Composite
Kjeldahl---N	Report	XXX	XXX	Report	XXX	2/week	24-Hr Composite
Nitrate-Nitrite as N	Report	XXX	XXX	Report	XXX	2/week	24-Hr Composite
Total Nitrogen	Report	Report	XXX	Report	XXX	1/month	Calculation
Total Phosphorus	Report	Report	XXX	Report	XXX	2/week	24-Hr Composite
Net Total Nitrogen[3]	Report	27,397	XXX	XXX	XXX	1/month	Calculation
Net Total Phosphorus[3]	Report	3,653	XXX	XXX	XXX	1/month	Calculation

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s): Outfall 001 .

Footnotes:
(1) See Part C for Chesapeake Bay Requirements.
(2) This is the minimum number of sampling events required. Permittees are encouraged, and it may be advantageous in demonstrating compliance, to perform more than the minimum number of sampling events required.
(3) The permittee is authorized to use 9,100 lbs/year as Total Nitrogen (TN) Offsets toward compliance with the Annual Net TN mass load limitations (Cap Loads), in accordance with Part C of this permit. These Offsets may be applied throughout the Compliance Year or during the Truing Period. The application of offsets must be reported to DEP as described in Part C. The Offsets are authorized for the following pollutant load reduction activities: Connection of 320 on-lot sewage disposal systems to the public sewer system after January 1, 2003, in which 25 lbs/year of TN offsets are granted per connection.
(4) The permittee will implement any modified reporting requirements upon receipt of notification from DEP

3.0 Facility NPDES Compliance History

3.1 Summary of Inspections

A summary of the most recent inspections during the existing permit review cycle is as follows.

The DEP inspector noted the following during the inspection.

09/09/2015:

- The facility was under a Consent Order and Agreement for work on the collection system I&I and to eliminate the single CSO.

12/22/2015:

- The facility applied 9,100 lbs of nitrogen credit during the last September reporting period.

09/01/2016:

- There was nothing significant to report.

10/05/2017:

- There was nothing significant to report.

01/09/2018:

- On January 6, 2017, the facility observed a liquid sludge from roof top drain on the ground. The sludge spread across a stone filled area between the two anaerobic digester tanks. The facility estimated that only about a gallon of sludge entered the storm water basin and that the sludge was removed by hand. The cause of the discharge was attributed to freezing within the first digester tank.

10/17/2018:

- Operator reported that the primary clarifiers were partially bypassed during heavy rain events to help avoid or lessen the duration of a CSO discharge.
- The facility was recently issued a permit amendment that rerates the organic design capacity of the plant from 2,100 to 3,000 lbs/day.
- Facility had 3 permitted stormwater outfalls. The outfalls were inspected during inspection.
- The influent flow meter was due for annual calibration.

12/27/2019:

- The facility applied offsets worth 9,100 lbs. of nitrogen. The offsets where gained from the connection of on-lot systems.

11/09/2020:

- The Borough's collection system consists of a single CSO (002), located behind 651 East Pitt Street. After a CSO inspection conducted by the Department in 2014, and a subsequent review of Bedford Borough's Nine Minimal Control Plan (NMCP) and Long Term Control Plan (LTCP), it was determined that the neither the NMCP or LTCP were being followed as written and the Borough was in violation of their NPDES permit. As an alternative to updating and implementing the NMCP and LTCP, Bedford Borough entered into a voluntary Consent Order and Agreement (CO&A) with the Department to eliminate the CSO. The CO&A required Bedford Borough to submit a plan to investigate removal of Inflow and Infiltration (I&I) from the combined sewer system. This I&I Investigation Plan was received by the Department and approved on April 7, 2015. The second corrective action required Bedford Borough to submit a Remediation Plan to the Department for review and approval. This plan was

received by the Department on August 19, 2016 and approved on September 13, 2016. The approved Remediation Plan calls for the completion of Phase 1 improvements to the collection system by November 30, 2021 and elimination of the CSO outfall by December 31, 2022. - The borough reports that the phase 1 upgrade project was completed on October 8, 2020. While the borough has completed work on the main sewer lines, private lateral lines still need to be checked. The borough plans to pressure check lateral lines next year and have homeowners make any necessary repairs. The operator believes the I&I reduction work in the CSO drainage basin has been effective and stated that average flow to the plant over the past year has been reduced by about 0.400 MGD. The borough reported 7 CSO discharges during the 2019 compliance year and 4 discharges during 2020. The last overflow occurred on October 29, 2020 after remnants from a tropical storm brought heavy rain to the area. Flow studies conducted by the borough show significant increases in flow from a contributing collection system (Bedford Township) during rain events. The borough is working with the township on a plan to correct the problems areas. The borough used portable flow meters during their I&I study but now have 8 permanent meters to monitor flow received from Bedford Township. During heavy rain, the operator will sometimes partially bypass the primary clarifiers in order to allow more flow through the plant and decrease the extent of the CSO discharge. The Department is notified by email when this occurs. (Abstracted from NPDES Compliance Inspection Report-Combined Sewer System on 11/09/2020).

3.2 Summary of DMR Data

A review of approximately 1-year of DMR data shows that the monthly average flow data for the facility below the design capacity of the treatment system. The maximum average flow data for the DMR reviewed was 0.752 MGD. The design capacity of the treatment system is 1.5 MGD.

The off-site laboratory used for the analysis of the parameters was Fairways Laboratories, Inc. at 2019 Ninth Avenue, PO Box 1925, Altoona, PA 16603.

The off-site laboratory used for the analysis of the whole effluent toxicity was American Aquatic Testing, Inc, 890 North Graham Street, Allentown, PA 18109.

DMR Data for Outfall 001 (from November 1, 2019 to October 31, 2020)

Parameter	OCT-20	SEP-20	AUG-20	JUL-20	JUN-20	MAY-20	APR-20	MAR-20	FEB-20	JAN-20	DEC-19	NOV-19
Flow (MGD) Average Monthly	0.487	0.501	0.515	0.427	0.364	0.565	0.720	0.702	0.675	0.752	0.614	0.490
Flow (MGD) Daily Maximum	1.536	0.925	0.998	0.714	0.609	1.316	1.649	1.474	1.080	1.551	1.543	0.794
pH (S.U.) Instantaneous Minimum	7.0	7.0	6.9	6.8	6.7	6.8	6.9	6.9	7.0	6.9	6.9	6.8
pH (S.U.) Instantaneous Maximum	7.2	7.2	7.2	7.2	7.0	7.3	7.2	7.3	7.4	7.3	7.2	7.3
DO (mg/L) Instantaneous Minimum	7.0	6.5	6.5	6.3	6.5	6.9	6.9	7.2	7.1	6.4	6.5	6.8
CBOD5 (lbs/day) Average Monthly	14	13	12	14	11	7.0	12.0	10.0	21	17	25	20.0
CBOD5 (lbs/day) Weekly Average	24	16	14	15	18	9.0	17.0	14.0	29	21	49	27.0
CBOD5 (mg/L) Average Monthly	3.4	3.1	3.2	3.8	3.8	1.8	1.9	1.8	3.8	3.3	4.5	5.1
CBOD5 (mg/L) Weekly Average	4.6	3.8	4.0	4.8	5.9	2.1	2.5	2.1	4.3	4.0	5.2	6.6
BOD5 (lbs/day) Raw Sewage Influent Average Monthly	1444	1470	1306	1391	1314	1123	1001	1195	1273	1237	1421	1246
BOD5 (lbs/day) Raw Sewage Influent Daily Maximum	2853	2227	1435	1966	1632	1345	1123	1360	1423	1492	1658	1490
BOD5 (mg/L) Raw Sewage Influent Average Monthly	307	295	309	290	293	192.0	140	187.0	189	193	242	272
TSS (lbs/day) Average Monthly	46	29	32	32	23	14.0	30.0	24	66	39	67	32.0
TSS (lbs/day) Raw Sewage Influent Average Monthly	1563	1551	1251	1417	1455	1329	1193	1255	1401	1201	1406	1177
TSS (lbs/day) Raw Sewage Influent Daily Maximum	4350	2984	1443	2268	2648	2219	1470	1469	1730	1498	1926	1321

TSS (lbs/day) Weekly Average	101	38	43	49	38	20.0	57.0	37	100	58	143	42.0
TSS (mg/L) Average Monthly	10.0	6.6	8.8	8.6	7.7	3.4	4.4	4.0	11.7	7.3	11.3	7.9
TSS (mg/L) Raw Sewage Influent Average Monthly	356	301	295	291	321	224.0	165	195	208	188	239	257
TSS (mg/L) Weekly Average	12.0	8.2	12.3	10.7	12.5	3.6	5.6	4.8	13.6	10.1	13.7	9.8
Fecal Coliform (No./100 ml) Geometric Mean	< 10.0	< 10.0	< 10.0	< 10.0	< 15.0	< 10.0	< 10.0	< 13	< 10.0	10.0	10.0	< 10.0
Fecal Coliform (No./100 ml) Instantaneous Maximum	< 10.0	< 10.0	< 10.0	< 10.0	399	10.0	< 10.0	85	< 10.0	< 10.0	10.0	10.0
Nitrate-Nitrite (mg/L) Average Monthly	< 1.236	< 1.841	< 1.785	< 1.693	< 3.438	< 3.639	< 4.874	< 2.101	< 1.208	< 1.656	< 3.139	4.45
Nitrate-Nitrite (lbs) Total Monthly	< 166	< 241	< 205	< 190	< 300	< 490	< 857	< 359	< 190	< 265	< 427	535
Total Nitrogen (mg/L) Average Monthly	< 2.947	< 4.092	< 4.065	< 3.148	< 5.941	< 5.943	< 7.641	< 14.418	< 14.919	< 7.249	< 6.695	< 7.256
Total Nitrogen (lbs) Effluent Net Total Monthly	< 433	< 546	< 466	< 359	< 518	< 796	< 1371	< 2301	2330	< 1179	< 1069	< 856
Total Nitrogen (lbs) Total Monthly	< 433	< 546	< 466	< 359	< 518	< 796.0	< 1371	< 2301	< 2330	< 1179	< 1069	< 856
Total Nitrogen (lbs) Effluent Net Total Annual		< 3893										
Total Nitrogen (lbs) Total Annual		< 3893										
Ammonia (lbs/day) Average Monthly	< 6	< 5	< 4.0	< 4	< 3.0	< 8.0	< 14	68	2353	28	< 17.0	8.0
Ammonia (mg/L) Average Monthly	< 1.1	< 1.16	< 1.0	< 1.06	< 1.0	< 1.87	< 2.3	13.51	15.115	5.413	< 2.800	2.12
Ammonia (lbs) Total Monthly	< 183	< 158	115	< 118	< 87	< 250.0	< 426	2095	2353	878	< 522	251
Ammonia (lbs) Total Annual		< 7513										
TKN (mg/L) Average Monthly	1.711	2.251	2.279	< 1.456	< 2.503	2.304	2.767	12.318	13.71	5.593	3.556	< 2.806

TKN (lbs) Total Monthly	267	305	261	< 168	< 218	305	514	1942	2140	914	642	< 321
Total Phosphorus (lbs/day) Average Monthly	4	7	6	7	6	6	9	9	8.0	6	8	7.0
Total Phosphorus (mg/L) Average Monthly	0.98	1.58	1.55	1.82	1.93	1.49	1.41	1.59	1.51	1.22	1.58	1.87
Total Phosphorus (lbs) Average Monthly	131	215	176	208	168	190.0	256	269	239	196	254	223
Total Phosphorus (lbs) Effluent Net Total Monthly	131	215	176	208	168	190	256	269	239	196	254	223
Total Phosphorus (lbs) Effluent Net Total Annual		2646										
Total Phosphorus (lbs) Total Annual		2646										
Total Copper (lbs/day) Average Monthly	< 0.03	< 0.06	< 0.04	< 0.03	< 0.03	0.05	< 0.07	< 0.04	< 0.07	0.05	< 0.03	0.04
Total Copper (mg/L) Average Monthly	< 0.01	< 0.01	< 0.0108	< 0.01	< 0.0112	< 0.0107	< 0.01	< 0.01	< 0.01	0.01	< 0.01	< 0.01
UV Dosage (mjoules/cm²) Instantaneous Minimum	49	84	62	82	60	120	127	90	127.0	136	116	111

DMR Data for Outfall 002 (from November 1, 2019 to October 31, 2020)

Parameter	OCT-20	SEP-20	AUG-20	JUL-20	JUN-20	MAY-20	APR-20	MAR-20	FEB-20	JAN-20	DEC-19	NOV-19
Flow (MGD) Average Monthly	0.002						0.0	00		0.008	0.0	
Flow (MGD) Daily Maximum	0.0625						0.08	0.03		0.215	0.015	

3.2.1 Chesapeake Bay Truing

The table summarizes the facility's compliance with Chesapeake Bay cap loads.

Chesapeake Bay Annual Nutrient Summary MA of Borough of Bedford PA0022209				
Year for Truing Period (Oct 1 - Nov 28)	Net Effluent Limits		Compliant with Permit Limits (Yes/No)	
	Nitrogen (lbs)	Phosphorus (lbs)	Nitrogen	Phosphorus
	27,397	***3,653***		
2018	22,022	3,184	Yes	Yes
2019	20,313	2,928	Yes	Yes

3.3 Non-Compliance

3.3.1 Non-Compliance- NPDES Effluent

A summary of the non-compliance to the permit limits for the existing permit cycle is as follows.

Summary of Non Compliance with NPDES Effluent Limits
Beginning August 1, 2015 and Ending December 2, 2020

NON COMPLIANCE DATE	NON COMPLIANCE CATEGORY	PARAMETER	SAMPLE VALUE	VIOLATION CONDITION	PERMIT VALUE	UNIT OF MEASURE	STATISTICAL BASE CODE
06/24/2016	Concentration 2 Effluent Violation	Ammonia-Nitrogen	15.1	>	7.5	mg/L	Average Monthly
06/24/2016	Load 1 Effluent Violation	Ammonia-Nitrogen	100	>	94	lbs/day	Average Monthly
07/26/2016	Concentration 2 Effluent Violation	Ammonia-Nitrogen	12.17	>	7.5	mg/L	Average Monthly
12/22/2016	Concentration 3 Effluent Violation	Fecal Coliform	10462	>	10000	CFU/100 ml	Instantaneous Maximum

3.3.2 Non-Compliance- Enforcement Actions

A summary of the non-compliance enforcement actions for the current permit cycle is as follows:

Summary of Enforcement Actions
Beginning August 1, 2015 and Ending December 2, 2020

ENF ID	ENF TYPE DESC	ENF CREATION DATE	EXECUTED DATE	VIOLATIONS	ENF FINALSTATUS	ENF CLOSED DATE
346929	Notice of Violation	09/13/2016	09/13/2016	92A.44	Comply/Closed	09/22/2016

3.4 Summary of Biosolids Disposal

Biosolids are either hauled to a landfill permitted for acceptance of municipal sludge or land applied as Class B Biosolids. The facility holds a biosolids generator permit and has an agricultural site that is approved for land application of the Class B biosolids that are produced by the WWTP.

A summary of the biosolids disposed of from the facility is as follows.

2019

Sewage Sludge / Biosolids Production Information

	Liquid Sewage Sludge/ Biosolids			Dewatered Sewage Slude/Biosolids		
	Hauled Off Site			Hauled Off Site		
Date (YEAR)	Gallons	% Solids	Dry Tons	Tons Dewatered	% Solids	Dry Tons
January				23.87	18.6	4.44
February				9.3	18.7	1.74
March	226,161	3.29	30.987	12.93	18	2.33
April				19.98	18.6	3.698
May				12.34	17.8	2.2
June				21.59	18.05	3.91
July	91,443	3.5	13.346	21.37	18.25	3.898
August				22.64	17.75	3.997
September	157,950	4.08	26.84	11.75	16.7	1.96
October	99,450	3.5	14.515	5.28	16.4	0.87
November				7.92	15.4	1.22
December				0		

Notes:

Biosolids disposed at:

Natali Brother Farm in Colerain Township, Bedford County for agricultural utilization

Sandy Run Landfill in Broad Towns Township, Bedford County

Mostoller Landfill in Somerset County

3.5 Open Violations

No open violations existed as of December 2020.

4.0 Receiving Waters and Water Supply Information Detail Summary

4.1 Receiving Waters

The receiving waters has been determined to be the Raystown Branch Juniata River. The sequence of receiving streams that the Raystown Branch Juniata River discharges into are the Juniata River and the Susquehanna River which eventually drains into the Chesapeake Bay.

4.2 Public Water Supply (PWS) Intake

The closest PWS to the subject facility is the Saxton Municipal Authority located approximately 50 miles downstream of the subject facility on the Raystown Branch Juniata River. Based upon the distance and the flow rate of the facility, the PWS should not be impacted.

4.3 Class A Wild Trout Streams

Class A Wild Trout Streams are waters that support a population of naturally produced trout of sufficient size and abundance to support long-term and rewarding sport fishery. DEP classifies these waters as high-quality coldwater fisheries.

The information obtained from EMAP suggests that no Class A Wild Trout Fishery will be impacted by this discharge.

4.4 2020 Integrated List of All Waters (303d Listed Streams)

Section 303(d) of the Clean Water Act requires States to list all impaired surface waters not supporting uses even after appropriate and required water pollution control technologies have been applied. The 303(d) list includes the reason for impairment which may be one or more point sources (i.e. industrial or sewage discharges) or non-point sources (i.e. abandoned mine lands or agricultural runoff and the pollutant causing the impairment such as metals, pH, mercury or siltation).

States or the U.S. Environmental Protection Agency (EPA) must determine the conditions that would return the water to a condition that meets water quality standards. As a follow-up to listing, the state or EPA must develop a Total Maximum Daily Load (TMDL) for each waterbody on the list. A TMDL identifies allowable pollutant loads to a waterbody from both point and non-point sources that will prevent a violation of water quality standards. A TMDL also includes a margin of safety to ensure protection of the water.

The water quality status of Pennsylvania's waters uses a five-part categorization (lists) of waters per their attainment use status. The categories represent varying levels of attainment, ranging from Category 1, where all designated water uses are met to Category 5 where impairment by pollutants requires a TMDL for water quality protection.

The receiving waters is listed in the 2020 Pennsylvania Integrated Water Quality Monitoring and Assessment Report as a Category 2 waterbody. The surface waters is an attaining stream that supports aquatic life. The designated use has been classified as protected waters for trout stock fishes and migratory fishes.

4.5 Low Flow Stream Conditions

Water quality modeling estimates are based upon conservative data inputs. The data are typically estimated using either a stream gauge or through USGS web based StreamStats program. The NPDES effluent limits are based upon the combined flows from both the stream and the facility discharge.

A conservative approach to estimate the impact of the facility discharge using values which minimize the total combined volume of the stream and the facility discharge. The volumetric flow rate for the stream is based upon the seven-day, 10-year low flow (Q710) which is the lowest estimated flow rate of the stream during a 7 consecutive day period that occurs once in 10 -year time period. The facility discharge is based upon a known design capacity of the subject facility.

The closest WQN station to the subject facility is the Raystown Branch Juniata River at Saxton, PA (WQN223). This WQN station is located approximately 51 miles downstream of the subject facility.

The closest gauge station to the subject facility is the Raystown Branch Juniata River at Saxton, PA (USGS station number 1562000). This gauge station is located approximately 51 miles downstream of the subject facility.

For WQM modeling, pH and stream water temperature data from the water quality network station was used. pH was estimated to be 8.00 and the stream water temperature was estimated to be 23.3 C.

The facility sampled for hardness upstream of the primary outfall in July 2019 and August 2019. The average hardness value for the three samples was 121.3 mg/l.

The low flow yield and the Q710 for the subject facility was estimated as shown below.

Gauge Station Data			
USGS Station Number	1562000		
Station Name	Raystown Branch Juniata River at Saxton, PA		
Q710	67.1	ft^3/sec	
Drainage Area (DA)	756	mi^2	
Calculations			
The low flow yield of the gauge station is:			
Low Flow Yield (LFY) = Q710 / DA			
LFY =	(67.1 ft^3/sec / 756 mi^2)		
LFY =	0.0888	$ft^3/sec/mi^2$	
The low flow at the subject site is based upon the DA of		161	mi^2
Q710 = (LFY@gauge station)(DA@Subject Site)			
Q710 = (0.0888 $ft^3/sec/mi^2$)(161 mi^2)			
Q710 =	14.290	ft^3/sec	

4.6 Summary of Discharge, Receiving Waters and Water Supply Information

Outfall No.	001	Design Flow (MGD)	1.5
Latitude	40Âº 1' 3.66"	Longitude	-78Âº 29' 8.43"
Quad Name		Quad Code	
Wastewater Description:	Effluent		

Receiving Waters	Raystown Branch Juniata River	Stream Code	13349
NHD Com ID	65847621	RMI	91
Drainage Area	161	Yield (cfs/mi^2)	0.0888
Q_{7-10} Flow (cfs)	14.29	Q_{7-10} Basis	Streamstats/Streamgauge
Elevation (ft)	1042	Slope (ft/ft)	
Watershed No.	11-C	Chapter 93 Class.	TSF/MF
Existing Use	Same as Chapter 93 class.	Existing Use Qualifier	
Exceptions to Use		Exceptions to Criteria	
Assessment Status	Attaining Use(s) supports aquatic life		
Cause(s) of Impairment	Not appl.		
Source(s) of Impairment	Not appl.		
TMDL Status	Not appl.	Name	

Background/Ambient Data		Data Source
pH (SU)	8.00	WQN223; median July to Sept
Temperature (°C)	23.3	WQN223; median July to Sept
Hardness (mg/L)	121.3	Data submitted in NPDES application
Other:		

Nearest Downstream Public Water Supply Intake		Saxton Municipal Authority	
PWS Waters	Raystown Branch Juniata River	Flow at Intake (cfs)	
PWS RMI		Distance from Outfall (mi)	50

5.0: Overview of Presiding Water Quality Standards

5.1 General

There are at least six (6) different policies which determines the effluent performance limits for the NPDES permit. The policies are technology based effluent limits (TBEL), water quality based effluent limits (WQBEL), antidegradation, total maximum daily loading (TMDL), anti-backsliding, and whole effluent toxicity (WET) The effluent performance limitations enforced are the selected permit limits that is most protective to the designated use of the receiving waters. An overview of each of the policies that are applicable to the subject facility has been presented in Section 6.

5.2.1 Technology-Based Limitations

TBEL treatment requirements under section 301(b) of the Act represent the minimum level of control that must be imposed in a permit issued under section 402 of the Act (40 CFR 125.3). Available TBEL requirements for the state of Pennsylvania are itemized in PA Code 25, Chapter 92a.47.

The presiding sources for the basis for the effluent limitations are governed by either federal or state regulation. The reference sources for each of the parameters is itemized in the tables. The following technology-based limitations apply, subject to water quality analysis and best professional judgement (BPJ) where applicable:

Parameter	Limit (mg/l)	SBC	Federal Regulation	State 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	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)

5.2.2 Mass Based Limits

For publicly owned treatment works (POTW), mass loadings are calculated based upon design flow rate of the facility and the permit limit concentration. The generalized calculation for mass loadings is shown below:

$$Quantity\left(\frac{lb}{day}\right) = (MGD)(Concentration)(8.34)$$

5.3 Water Quality-Based Limitations

WQBEL are based on the need to attain or maintain the water quality criteria and to assure protection of designated and existing uses (PA Code 25, Chapter 92a.2). The subject facility that is typically enforced is the more stringent limit of either the TBEL or the WQBEL.

Determination of WQBEL is calculated by spreadsheet analysis or by a computer modeling program developed by DEP. DEP permit engineers utilize the following computing programs for WQBEL permit limitations: (1) MS Excel worksheet for Total Residual Chorine (TRC); (2) WQM 7.0 for Windows Wasteload Allocation Program for Dissolved Oxygen and Ammonia Nitrogen Version 1.0 (WQM Model) and (3) PENTOXSD using DEP Toxics Management Spreadsheet for Toxics pollutants.

5.3.1 Water Quality Modeling 7.0

The WQM Model is a computer model that is used to determine NPDES discharge effluent limitations for Carbonaceous BOD (CBOD5), Ammonia Nitrogen (NH3-N), and Dissolved Oxygen (DO) for single and multiple point source discharges scenarios. WQM Model is a complete-mix model which means that the discharge flow and the stream flow are assumed to instantly and completely mixed at the discharge node.

WQM recommends effluent limits for DO, CBOD5, and NH_3-N in mg/l for the discharge(s) in the simulation.

Four types of limits may be recommended. The limits are (a) a *minimum concentration for DO in the discharge as 30-day average; (b) a 30-day average concentration for CBOD5 in the discharge; (c) a 30-day average concentration for the NH_3-N in the discharge; (d) 24-hour average concentration for NH_3-N in the discharge*.

The WQM Model requires several input values for calculating output values. The source of data originates from either EMAP, the National Map, or Stream Stats. Data for stream gauge information, if any, was abstracted from USGS Low-Flow, Base-Flow, and Mean-Flow Regression Equations for Pennsylvania Streams authored by Marla H. Stuckey (Scientific Investigations Report 2006-5130).

The input values utilized for the modeling are summarized in the table which can be found in Attachment B.

The applicable WQM Effluent Limit Type are discussed in Section 6 under the corresponding parameter which is either DO, CBOD, or ammonia-nitrogen.

5.3.2 PENTOXSD Modeling

The PENTOXSD model is a computer model that is used to determine effluent limitations for toxics (and other substances) for single discharge wasteload allocations. This computer model uses a mass-balance water quality analysis that includes consideration for mixing, first-order decay, and other factors used to determine recommended water quality-based effluent limits. PENTOXSD does not assume that all discharges completely mix with the stream. The point of compliance with water quality criteria are established using criteria compliance times (CCTs). The available CCTs are either acute fish criterion (AFC), chronic fish criterion (CFC), or human health criteria (THH & CRL).

Acute Fish Criterion (AFC) measures the criteria compliance time as either the maximum criteria compliance time (i.e.15 minutes travel time downstream of the current discharge) or the complete mix time whichever comes first. AFC is evaluated at Q710 conditions.

Chronic Fish Criterion (CFC) measures the criteria compliance time as either the maximum criteria compliance time (i.e. 12 hours travel time downstream of the current discharge) or the complete mix time whichever comes first. CFC is evaluated at Q710 conditions.

Threshold Human Health (THH) measures the criteria compliance time as either the maximum criteria compliance time (i.e. 12 hours travel time downstream of the current discharge) or the estimated travel time downstream to the nearest potable water supply intake whichever comes first. THH is evaluated at Q710 conditions.

Cancer Risk Level (CRL) measures the criteria compliance time as either the maximum criteria compliance time (i.e. 12 hours travel time downstream of the current discharge) or the complete mix time whichever comes first. CRL is evaluated at Qh (harmonic mean or normal flow) conditions.

The PENTOXSD Model requires several input values for calculating output values. The source of data originates from either EMAP, the National Map, or Stream Stats. Data for stream gauge information, if any, was abstracted from USGS Low-Flow, Base-Flow, and Mean-Flow Regression Equations for Pennsylvania Streams authored by Marla H. Stuckey (Scientific Investigations Report 2006-5130).

The input values utilized for the modeling are summarized in the table which can be found in Attachment B.

5.3.2.1 Determining if NPDES Permit Will Require Monitoring/Limits in the Proposed Permit for Toxic Pollutants

To determine if PENTOXSD modeling is necessary, DEP has developed a Toxics Management Spreadsheet to identify toxics of concern. Toxic pollutants whose maximum concentrations as reported in the permit application or on DMRs are greater than the most stringent applicable water quality criterion are pollutants of concern. A Reasonable Potential Analysis was utilized to determine (a) if the toxic parameters modeled would require monitoring or (b) if permit limitations would be required for the parameters. The toxics reviewed for reasonable potential were the pollutants in Groups 1 through 5 and the emerging pollutants outlined in an email from Central Office on January 23, 2014.

The Toxics Management Spreadsheet indicated PENTOXSD modeling was required since the concentrations measured in the effluent sample were not within the normal range for safe water quality protection.

Based upon the SOP- Establishing Water Quality-Based Effluent Limitations (WQBELs) and Permit Conditions for Toxic Pollutants (Revised January 10, 2019), monitoring and/or limits will be established as follows.

(a) When reasonable potential is demonstrated, establish limits where the maximum reported concentration equals or exceeds 50% of the WQBEL.
(b) For non-conservative pollutants, establish monitoring requirements where the maximum reported concentration is between 25% - 50% of the WQBEL.
(c) For conservative pollutants, establish monitoring requirements where the maximum reported concentration is between 10% - 50% of the WQBEL.

The table below summarizes the screening recommendation for toxics.

Summary of PENTOXSD Screening Recommendations for Toxics

Parameter	Max Concentration in Application or DMR (µg/L)	Most Stringent WQBEL (µg/L)	Governing Criterion (AFC, CFC, THH, or CRL)	Screening Recommendation
Total Cadmium	0.334	2.37	CFC	Monitor
Total Copper	11.3	35.5	AFC	Monitor
Zinc	33.7	293	AFC	Monitor

Applicable monitoring or permit limits for toxics are summarized in Section 6.

The Toxics Screening Analysis and the PENTOXSD output has been included in Attachment B.

5.3.3 Whole Effluent Toxicity (WET)

Whole effluent toxicity is the aggregate toxic effect from a facility's wastewater discharge on aquatic organisms. WET measures the effect of wastewater effluent on an organisms' ability to survive, grow, and reproduce. WET testing is either acute or chronic. Acute testing measures lethality, the ability for an organism to survive after no more than 96 hours of exposure to an effluent. Chronic tests measures both lethality, immobility, and sublethal endpoints to exposures ranging longer than 96 hours and up to 8 days.

WET is required if the applicant satisfies any one of the following conditions.

(a) Major sewage facilities with an average annual design flow greater than or equal to 1.0 MGD (25 Pa. Code § 92a.27(a)(1)(i)).
(b) Sewage facilities with EPA-approved pretreatment programs or will be required in the permit to develop a program (25 Pa. Code § 92a.27(a)(1)(i)).
(c) Other facilities that are considered candidates for WET testing by one or more of the factors contained in 25 Pa. Code § 92a.27(a)(2).

5.3.3.1 WET Tests Review

The in-stream waste concentration and dilution series was estimated using partial mixing factor factors from PENTOXSD, the design flow rate for the facility, and the Q710.

The proposed NPDES permit shall utilize a chronic instream waste concentration of 14%. The complete dilution series will be 4%, 7%, 14%, 57%, and 100%.

The derivation is shown in the calculations.

Whole Effluent Toxicity (WET)

For Outfall 001, **Chronic** WET Testing was completed:

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

The dilution series used for the tests was: 100%, 57%, 14%, 7%, and 4%. The Target Instream Waste Concentration (TIWC) to be used for analysis of the results is: 14%.

Summary of Four Most Recent Test Results

(NOTE – Enter results into one table, depending on which data analysis method was used).

TST Data Analysis

(NOTE – In lieu of recording information below, the application manager may attach the DEP WET Analysis Spreadsheet).

Test Date	*Ceriodaphnia* Results (Pass/Fail)		*Pimephales* Results (Pass/Fail)	
	Survival	Reproduction	Survival	Growth
9/19/2016	PASS	PASS	PASS	PASS
9/4/2017	PASS	PASS	PASS	PASS
10/18/2018	PASS	PASS	PASS	PASS
9/17/2019	PASS	PASS	PASS	PASS

***** *A "passing" result is that in which the replicate data for the TIWC is not statistically significant from the control condition. This is exhibited when the calculated t value ("T-Test Result") is greater than the critical t value. A "failing" result is exhibited when the calculated t value ("T-Test Result") is less than the critical t value.*

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).*

Comments:

No. All four WET tests passed. There is no reasonable potential.

Data

PMFa =	0.281	
PMFc =	1	
Qd =	1.5	MGD
Q710 =	14.29	cfs

Step 1: Determine IWC - Acute (IWCa)

IWCa = [(Qd x 1.547) / ((Q7-10 x PMFa) + (Qd x 1.547))] x 100

IWCa = 36.62

Is IWCA < 1% No (Yes- acute tests required; No- chronic test required)

If the discharge is to the tidal portion of the Delaware River, indicate how the type of test was determined.

Type of Test for Permit Renewal:

Since IWCA does not exceed 1%, chronic tests will be required

Step 2a: Determine Target IWCa (If acute tests required)

TIWCa = IWCA / 0.3

TIWCa = 122.08

Step 2b: Determine Target IWCc (If chronic tests required)

ICCc = [(Qd x 1.547) / ((Q7-10 x PWFc) + (Design Flow MGD x 1.547))] x 100

ICCc = 14

Step 3: Determine Dilution Series

Dilution Series =	100%	57%	14%	7%	4%

WET Limits

Has reasonable potential been determined ? No

Will WET limits be established in the permit ? No

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

Not applicable

If WET limits will not be established, but reasonable potential was determined, indicate the rationale for not establishing WET limits

Not applicable

5.4 Total Maximum Daily Loading (TMDL)

5.4.1 TMDL

The goal of the Clean Water Act (CWA), which governs water pollution, is to ensure that all of the Nation's waters are clean and healthy enough to support aquatic life and recreation. To achieve this goal, the CWA created programs designed to regulate and reduce the amount of pollution entering United States waters. Section 303(d) of the CWA requires states to assess their waterbodies to identify those not meeting water quality standards. If a waterbody is not meeting standards, it is listed as impaired and reported to the U.S. Environmental Protection Agency. The state then develops a plan to clean up the impaired waterbody. This plan includes the development of a Total Maximum Daily Load (TMDL) for the pollutant(s) that were found to be the cause of the water quality violations. A Total Maximum Daily Load (TMDL) calculates the maximum amount of a specific pollutant that a waterbody can receive and still meet water quality standards.

Pennsylvania has committed to restoring all impaired waters by developing TMDLs and TMDL alternatives for all impaired waterbodies. The TMDL serves as the starting point or planning tool for restoring water quality.

5.4.1.1 Local TMDL

The subject facility does not discharge into a local TMDL.

5.4.1.2 Chesapeake Bay TMDL Requirement

The Chesapeake Bay Watershed is a large ecosystem that encompasses approximately 64,000 square miles in Maryland, Delaware, Virginia, West Virginia, Pennsylvania, New York and the District of Columbia. An ecosystem is composed of interrelated parts that interact with each other to form a whole. All of the plants and animals in an ecosystem depend on each other in some way. Every living thing needs a healthy ecosystem to survive. Human activities affect the Chesapeake Bay ecosystem by adding pollution, using resources and changing the character of the land.

Most of the Chesapeake Bay and many of its tidal tributaries have been listed as impaired under Section 303(d) of the federal Water Pollution Control Act ("Clean Water Act"), 33 U.S.C. § 1313(d). While the Chesapeake Bay is outside the boundaries of Pennsylvania, more than half of the State lies within the watershed. Two major rivers in Pennsylvania are part of the Chesapeake Bay Watershed. They are (a) the Susquehanna River and (b) the Potomac River. These two rivers total 40 percent of the entire Chesapeake Bay watershed.

The overall management approach needed for reducing nitrogen, phosphorus and sediment are provided in the Bay TMDL document and the Phase I, II, and III WIPs which is described in the Bay TMDL document and Executive Order 13508.

The Bay TMDL is a comprehensive pollution reduction effort in the Chesapeake Bay watershed identifying the necessary pollution reductions of nitrogen, phosphorus and sediment across the seven Bay watershed jurisdictions of Delaware, Maryland, New York, Pennsylvania, Virginia, West Virginia and the District of Columbia to meet applicable water quality standards in the Bay and its tidal waters.

The Watershed Implementation Plans (WIPs) provides objectives for how the jurisdictions in partnership with federal and local governments will achieve the Bay TMDL's nutrient and sediment allocations.

Phase 3 WIP provides an update on Chesapeake Bay TMDL implementation activities for point sources and DEP's current implementation strategy for wastewater. The latest revision of the supplement was December 17, 2019.

The Chesapeake Bay TMDL (Appendix Q) categorizes point sources into four sectors:

- Sector A- significant sewage dischargers;
- Sector B- significant industrial waste (IW) dischargers;
- Sector C- non-significant dischargers (both sewage and IW facilities); and
- Sector D- combined sewer overflows (CSOs).

All sectors contain a listing of individual facilities with NPDES permits that were believed to be discharging at the time the TMDL was published (2010). All sectors with the exception of the non-significant dischargers have individual wasteload allocations (WLAs) for TN and TP assigned to specific facilities. Non-significant dischargers have a bulk or aggregate allocation for TN and TP based on the facilities in that sector that were believed to be discharging at that time and their estimated nutrient loads.

Based upon the supplement the subject facility has been categorized as a Sector A discharger. The supplement defines Sector A as a sewage facility that is considered significant if it has a design flow of at least 0.4 MGD. For rollout of its permitting strategy, DEP classified these facilities into three phases.

Table 5 presents all NPDES permits for Significant Sewage dischargers with Cap Loads. The NPDES Permit No., phase, facility name, latest permit issuance date, expiration date, Cap Load compliance start date, TN and TP Cap Loads, and TN and TP Delivery Ratios are presented. In addition, if TN Offsets were incorporated into the TN Cap Loads when the permit was issued, the amount is shown; these Offsets will be removed from Cap Loads upon issuance of renewed permits to implement Section III of the WIP document (i.e., a facility may use Offsets for compliance but may not register them as credits).

The total nitrogen (TN) and total phosphorus (TP) cap loads itemized by Table 5 for the subject facility are as follows:

TN Cap Load (lbs/yr)	27,397
TN Delivery Ratio	0.897
TP Cap Load (lbs/yr)	3,653
TP Delivery Ratio	0.436

Expansions by any Significant Sewage discharger will not result in any increase in Cap Loads. Where non-significant facilities expand to a design flow of 0.4 MGD or greater, the lesser of baseline Cap Loads of 7,306 lbs/yr TN and 974 lbs/yr TP or existing performance will be used for permits, and the load will be moved from the Non-Significant sector load to the Significant Sewage sector load. If considered necessary for environmental protection, DEP may decide to move load from the Point Source Reserve to the Significant Sewage sector in the future.

The minimum monitoring frequency for TN species and TP in new or renewed NPDES permits for Significant Sewage dischargers is 2/week.

This facility is subject to Sector A monitoring requirements. Monitoring shall be required at least 2x/wk.

DEP intends to continue addressing CSOs through its CSO Policy (DEP ID No. 385-2000-011), including the Nine Minimum Controls (NMCs), Long-Term Control Plans (LTCPs) and Post-Construction Monitoring.

The last remaining, CSO002, will be separated by December 31, 2022.

T**5.5 Anti-Degradation Requirement**

Chapter 93.4a of the PA regulations requires that surface water of the Commonwealth of Pennsylvania may not be degraded below levels that protect the existing uses. The regulations specifically state that *Existing instream water uses and the level of water quality necessary to protect the existing uses shall be maintained and protected*. Antidegradation requirements are implemented through DEP's guidance manual entitled Water Quality Antidegradation Implementation Guidance (Document #391-0300-02).

The policy requires DEP to protect the existing uses of all surface waters and the existing quality of High Quality (HQ) and Exceptional Value (EV) Waters. Existing uses are protected when DEP makes a final decision on any permit or approval for an activity that may affect a protected use. Existing uses are protected based upon DEP's evaluation of the best available information (which satisfies DEP protocols and Quality Assurance/Quality Control (QA/QC) procedures) that indicates the protected use of the waterbody.

For a new, additional, or increased point source discharge to an HQ or EV water, the person proposing the discharge is required to utilize a nondischarge alternative that is cost-effective and environmentally sound when compared with the cost of the proposed discharge. If a nondischarge alternative is not cost-effective and environmentally sound, the person must use the best available combination of treatment, pollution prevention, and wastewater reuse technologies and assure that any discharge is nondegrading. In the case of HQ waters, DEP may find that after satisfaction of

intergovernmental coordination and public participation requirements lower water quality is necessary to accommodate important economic or social development in the area in which the waters are located. In addition, DEP will assure that cost-effective and reasonable best management practices for nonpoint source control in HQ and EV waters are achieved.

The subject facility's discharge will be to a non-special protection waters and the permit conditions are imposed to protect existing instream water quality and uses. Neither HQ waters or EV waters is impacted by this discharge.

5.6 Anti-Backsliding

Anti-backsliding is a federal regulation which prohibits a permit from being renewed, reissued, or modified containing effluent limitations which are less stringent than the comparable effluent limitations in the previous permit (40 CFR 122.l.1 and 40 CFR 122.l.2). A review of the existing permit limitations with the proposed permit limitations confirm that the facility is consistent with anti-backsliding requirements. The facility has proposed effluent limitations that are as stringent as the existing permit.

6.0 NPDES Parameter Details

The basis for the proposed sampling and their monitoring frequency that will appear in the permit for each individual parameter are itemized in this Section. The final limits are the more stringent of technology based effluent treatment (TBEL) requirements, water quality based (WQBEL) limits, TMDL, antidegradation, anti-degradation, or WET.

The reader will find in this section:

a) a justification of recommended permit monitoring requirements and limitations for each parameter in the proposed NPDES permit;
b) a summary of changes from the existing NPDES permit to the proposed permit; and
c) a summary of the proposed NPDES effluent limits.

6.1 Recommended Monitoring Requirements and Effluent Limitations

A summary of the recommended monitoring requirements and effluent limitations are itemized in the tables. The tables are categorized by (a) Conventional Pollutants and Disinfection, (b) Nitrogen Species and Phosphorus, and (c) Toxics.

The previous Fact Sheet modelled Bedford Borough and Snake Spring Municipal Authority discharges together to determine interaction between the two discharges. Snake Spring Municipal Authority outfall is located approximately 3 miles downstream of the Borough of Bedford (PA0022209**)**. The model result showed no apparent interaction between the two discharges.

WQM modeling was again completed with and without a Snake Spring STP. Modeling suggested that the Borough of Bedford and Snake Spring STP are not impacted by each other's discharge. The model output shows that the minimum D.O goal of 6 mg/l due to TSF will be attained.

6.1.1 Conventional Pollutants and Disinfection

Summary of Proposed NPDES Parameter Details for Conventional Pollutants and Disinfection MA of Borough of Bedford; PA0022209			
Parameter	**Permit Limitation Required by[1]:**	**Recommendation**	
pH (S.U.)	TBEL	Monitoring:	The monitoring frequency shall be daily as a grab sample (Table 6-3).
		Effluent Limit:	Effluent limits may range from pH = 6.0 to 9.0
		Rationale:	The monitoring frequency has been assigned in accordance with Table 6-3 and the effluent limits assigned by Chapter 95.2(1).
Dissolved Oxygen	BPJ	Monitoring:	The monitoring frequency shall be daily as a grab sample (Table 6-3).
		Effluent Limit:	Effluent limits shall be greater than 5.0 mg/l.
		Rationale:	The monitoring frequency has been assigned in accordance with Table 6-3 and the effluent limits assigned by best professional judgement.
CBOD	WQBEL	Monitoring:	The monitoring frequency shall be 2x/wk as an 24-hr composite sample (Table 6-3).
		Effluent Limit:	Effluent limits shall not exceed 250 lbs/day and 20 mg/l as an average monthly.
		Rationale:	The monitoring frequency has been assigned in accordance with Table 6-3 and the effluent limits assigned by WQBEL. WQM modeling indicates that WQBEL is more stringent than TBEL. Thus, the permit limit is confined to WQBEL.
TSS	TBEL	Monitoring:	The monitoring frequency shall be 2/wk as a 24-hr composite sample (Table 6-3).
		Effluent Limit:	Effluent limits shall not exceed 375 lbs/day and 30 mg/l as an average monthly.
		Rationale:	The monitoring frequency has been assigned in accordance with Table 6-3 and the effluent limits assigned by Chapter 92a.47(a)(1). While there is no WQM modeling for this parameter, the permit limit for TSS is generally assigned similar effluent limits as CBOD or BOD. Since the TBEL is more stringent than TBEL, TBEL will apply.
UV disinfection	SOP	Monitoring:	The monitoring frequency is 1/day. The facility will be required to record the UV dosage.
		Effluent Limit:	No effluent requirements.
		Rationale:	Consistent with the SOP- Establishing Effluent Limitations for Individual Sewage Permits (Revised January 10, 2019), the facility will be required to have routine monitoring for UV transmittance, UV dosage, or UV intensity.
Fecal Coliform	TBEL	Monitoring:	The monitoring frequency shall be 2x/wk as a grab sample (Table 6-3).
		Effluent Limit:	Summer effluent limits shall not exceed 200 No./100 mL as a geometric mean. Winter effluent limits shall not exceed 2000 No./100 mL as a geometric mean.
		Rationale:	The monitoring frequency has been assigned in accordance with Table 6-3 and the effluent limits assigned by Chapter 92a.47(a)(4) and 92a.47(a)(5).
Notes:			
1 The NPDES permit was limited by (a) anti-Backsliding, (b) Anti-Degradation, (c) SOP, (d) TBEL, (e) TMDL, (f) WQBEL, (g) WET, or (h) Other			
2 Monitoring frequency based on flow rate of 1.5 MGD.			
3 Table 6-3 (Self Monitoring Requirements for Sewage Discharges) in Technical Guidance for the Development and Specification of Effluent Limitations and Other Permit Conditions in NPDES Permits) (Document # 362-0400-001) Revised 10/97			
4 Water Quality Antidegradation Implementaton Guidance (Document # 391-0300-002)			
5 Phase 2 Watershed Implementation Plan Wastewater Supplement, Revised September 6, 2017			

6.1.2 Nitrogen Species and Phosphorus

Summary of Proposed NPDES Parameter Details for Nitrogen Species and Phosphorus

MA of Borough of Bedford; PA0022209

Parameter	Permit Limitation Required by[1]:	Recommendation	
Ammonia-Nitrogen	WQBEL	Monitoring:	The monitoring frequency shall be 2x/wk as a 24-hr composite sample
		Effluent Limit:	Effluent limits shall not exceed 87 lbs/day and 7.0 mg/l as an average monthly.
		Rationale:	WQM recommends water quality based effluent limits.
Nitrate-Nitrite as N	Chesapeake Bay TMDL	Monitoring:	The monitoring frequency shall be 2x/wk as a 24-hr composite sample
		Effluent Limit:	No effluent requirements.
		Rationale:	Due to the Chesapeake Bay Implementation Plan, the facility is required to be monitored on a frequency at least 2x/wk.
Total Nitrogen	Chesapeake Bay TMDL	Monitoring:	The monitoring frequency shall be 1x/mo as a 24-hr composite sample
		Effluent Limit:	No effluent requirements.
		Rationale:	Due to the Chesapeake Bay Implementation Plan, the facility is required to be monitored on a frequency at least 1x/mo.
TKN	Chesapeake Bay TMDL	Monitoring:	The monitoring frequency shall be 2x/wk as a 24-hr composite sample
		Effluent Limit:	No effluent requirements.
		Rationale:	Due to the Chesapeake Bay Implementation Plan, the facility is required to be monitored on a frequency at least 2x/wk.
Total Phosphorus	Anti-backsliding	Monitoring:	The monitoring frequency shall be 2x/wk as a 24-hr composite sample
		Effluent Limit:	Effluent limits shall not exceed 25 lbs/day and 2.0 mg/l as an average monthly.
		Rationale:	The effluent limit was asigned for the protection of Lake Raystown. All dischargers within 60 days of the lake were required to have this limit. Due to anti-backsliding regulations, this limit shall continue in the proposed permit.Chesapeake Bay WIP also requires monitoring for this parameter 2x/wk.
Net Total Nitrogen	Chesapeake Bay TMDL	Monitoring:	The monitoring frequency shall be 1x/mo.
		Effluent Limit:	The cap load is 27,397 lbs/yr.
		Rationale:	Due to the Chesapeake Bay Implementation Plan, the facility has a cap load.
Net Total Phosphorus	Chesapeake Bay TMDL	Monitoring:	The monitoring frequency shall be 1x/mo.
		Effluent Limit:	The cap load is 3,653 lbs/yr
		Rationale:	Due to the Chesapeake Bay Implementation Plan, the facility has a cap load.

Notes:

1 The NPDES permit was limited by (a) anti-Backsliding, (b) Anti-Degradation, (c) SOP, (d) TBEL, (e) TMDL, (f) WQBEL, (g) WET, or (h) Other

2 Monitoring frequency based on flow rate of 1.5 MGD.

3 Table 6-3 (Self Monitoring Requirements for Sewage Discharges) in Technical Guidance for the Development and Specification of Effluent Limitations and Other Permit Conditions in NPDES Permits) (Document # 362-0400-001) Revised 10/97

4 Water Quality Antidegradation Implementaton Guidance (Document # 391-0300-002)

5 Phase 2 Watershed Implementation Plan Wastewater Supplement, Revised September 6, 2017

6.1.3 Toxics

A total of nine (9) different toxic pollutants were observed during sampling of the Pollutant Groups. The consultant suggested that the lab is unable to provide quantitation limits for these compounds since the compounds are not in the lab's quantitation library. The nine (9) toxic pollutants itemized in the NPDES renewal application are listed below.

- 4-(1,1-dimethylpropyl)-phenol
- Beta-phenyl-benzenepropanenitrile
- 9-Octadecenamide, (Z)
- 2-butoxy-phosphate (3:1) ethanol
- 13-docosenamide (Z)
- Squalene
- 5-(hydroxyhexyl)-tetrahydrofuran-2-one
- 1-Pentadecene
- Octadecanoic Acid

DEP Central Office on December 21, 2020 suggested that (a) the aforementioned pollutants have not been characterized with water quality criteria needed for toxics modeling and (b) since the WET testing had passed its likely that the pollutants are not at a concentration impacting the receiving stream.

Dilution by assimilative capacity in the Raystown Branch Juniata River is possible.

The pollutants have been noted in this Fact Sheet as trace toxics pollutant observed during the laboratory analysis. The pollutants shall also be reviewed in the next renewal cycle.

6.1.3.1 Summary of Toxics Monitoring/Limits

Summary of Proposed NPDES Parameter Details for Toxics

MA of Borough of Bedford; PA0022209

Parameter	Permit Limitation Required by[1]:	Recommendation	
Total Cadmium	WQBEL	Monitoring:	The monitoring frequency shall be 1x/mo as a 24-hr composite sample
		Effluent Limit:	No effluent requirements.
		Rationale:	PENTOXSD recommends monitoring for this parameter
Total Copper	WQBEL	Monitoring:	The monitoring frequency shall be 2x/mo as a 24-hr composite sample
		Effluent Limit:	No effluent requirements.
		Rationale:	PENTOXSD recommends monitoring for this parameter. Additionally, a review of the last 12 months of DMR for copper sampling results does support continue monitoring for this parameter.
Total Zinc	WQBEL	Monitoring:	The monitoring frequency shall be 1x/mo as a 24-hr composite sample
		Effluent Limit:	No effluent requirements.
		Rationale:	PENTOXSD recommends monitoring for this parameter

Notes:

1 The NPDES permit was limited by (a) anti-Backsliding, (b) Anti-Degradation, (c) SOP, (d) TBEL, (e) TMDL, (f) WQBEL, (g) WET, or (h) Other

2 Monitoring frequency based on flow rate of 1.5 MGD.

3 Table 6-3 (Self Monitoring Requirements for Sewage Discharges) in Technical Guidance for the Development and Specification of Effluent Limitations and Other Permit Conditions in NPDES Permits) (Document # 362-0400-001) Revised 10/97

4 Water Quality Antidegradation Implementaton Guidance (Document # 391-0300-002)

5 Phase 2 Watershed Implementation Plan Wastewater Supplement, Revised September 6, 2017

6.2 Summary of Changes From Existing Permit to Proposed Permit

A summary of how the proposed NPDES permit differs from the existing NPDES permit is summarized as follows.

Changes in Permit Monitoring or Effluent Quality

Parameter	Existing Permit	Draft Permit
Ammonia-Nitrogen	Effluent limits are 94 lbs/day and 7.5 mg/l.	For the last 12 months of DMR, there were some sampling results well above the current permit limit of 7.5 mg/l. The facility should investigate and resolve the exceedances of ammonia-nitrogen. When the facility is in compliance with NPDES effluent limits, the sampling results were well below permit limits. WQM modeling recommends an effluent limit of 7.0 mg/l as an average monthly. The effluent limit was adjusted from 7.19 mg/l to 7.0 mg/l due to mathematical rounding. This is slightly less than the current permit limit of 7.5 mg/l.
Total Cadmium	No monitoring or effluent limits	PENTOXSD recommends monitoring for this parameter. Monitoring shall be required 1x/month.
Total Zinc	No monitoring or effluent limits	PENTOXSD recommends monitoring for this parameter. Monitoring shall be required 1x/month.

6.3.1 Summary of Proposed NPDES Effluent Limits

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.

The proposed NPDES effluent limitations are summarized in the table below.

PART A - EFFLUENT LIMITATIONS, MONITORING, RECORDKEEPING AND REPORTING REQUIREMENTS

I. A. For Outfall 001 , **Latitude** 40° 1' 3.43" , **Longitude** 78° 29' 8.30" , **River Mile Index** 91 , **Stream Code** 13349

Receiving Waters: Shobers Run (HQ-CWF)

Type of Effluent: Effluent

1. The permittee is authorized to discharge during the period from **Permit Effective Date** through **Permit Expiration Date**.
2. Based on the anticipated wastewater characteristics and flows described in the permit application and its supporting documents and/or amendments, the following effluent limitations and monitoring requirements apply (see also Additional Requirements and Footnotes).

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
Dissolved Oxygen	XXX	XXX	5.0	XXX	XXX	XXX	1/day	Grab
Carbonaceous Biochemical Oxygen Demand (CBOD5)	250	400	XXX	20	32	40	2/week	24-Hr Composite
Biochemical Oxygen Demand (BOD5) Raw Sewage Influent	Report	Report Daily Max	XXX	Report	XXX	XXX	2/week	24-Hr Composite
Total Suspended Solids	375	563	XXX	30	45	60	2/week	24-Hr Composite
Total Suspended Solids Raw Sewage Influent	Report	Report Daily Max	XXX	Report	XXX	XXX	2/week	24-Hr Composite
Fecal Coliform (No./100 ml) Oct 1 - Apr 30	XXX	XXX	XXX	2000 Geo Mean	XXX	10000	2/week	Grab
Fecal Coliform (No./100 ml) May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	XXX	1000	2/week	Grab
Ammonia-Nitrogen Nov 1 - Apr 30	Report	XXX	XXX	Report	XXX	Report	2/week	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	Weekly Average	Instantaneous Minimum	Average Monthly	Weekly Average	Instant. Maximum		
Ammonia-Nitrogen May 1 - Oct 31	87	XXX	XXX	7.0	XXX	14	2/week	24-Hr Composite
Total Phosphorus	25	XXX	XXX	2.0	XXX	4	2/week	24-Hr Composite
Cadmium, Total	Report	XXX	XXX	Report	XXX	XXX	1/month	24-Hr Composite
Copper, Total	Report	XXX	XXX	Report	XXX	XXX	2/month	24-Hr Composite
Zinc, Total	Report	XXX	XXX	Report	XXX	XXX	1/month	24-Hr Composite
Ultraviolet light dosage (mjoules/cm²)	XXX	XXX	Report	XXX	XXX	XXX	1/day	Recorded

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s):

at Outfall 001

PART A - EFFLUENT LIMITATIONS, MONITORING, RECORDKEEPING AND REPORTING REQUIREMENTS

I. B. For Outfall 002 , **Latitude** 40° 1' 9.00" , **Longitude** 78° 29' 28.00" , **River Mile Index** _____ , **Stream Code** _____

Receiving Waters: Raystown Branch Juniata River (TSF)

Type of Effluent: Combined Sewer Overflow

1. The permittee is authorized to discharge during the period from **Permit Effective Date** through **Permit Expiration Date**.
2. Based on the anticipated wastewater characteristics and flows described in the permit application and its supporting documents and/or amendments, the following effluent limitations and monitoring requirements apply (see also Additional Requirements and Footnotes).

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	Maximum	Instant. Maximum		
Flow (MGD)	Report	Report Daily Max	XXX	XXX	XXX	XXX	1/discharge	Estimate

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s):

at Outfall 002

PART A - EFFLUENT LIMITATIONS, MONITORING, RECORDKEEPING AND REPORTING REQUIREMENTS

I. C. For Outfall 001 , **Latitude** 40° 1' 3.43" , **Longitude** 78° 29' 8.30" , **River Mile Index** 91 , **Stream Code** 13349

Receiving Waters: Shobers Run (HQ-CWF)

Type of Effluent: Effluent

1. The permittee is authorized to discharge during the period from Permit Effective Date through Permit Expiration Date.
2. Based on the anticipated wastewater characteristics and flows described in the permit application and its supporting documents and/or amendments, the following effluent limitations and monitoring requirements apply (see also Additional Requirements and Footnotes).

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Monthly	Annual	Monthly	Monthly Average	Maximum	Instant. Maximum		
Ammonia--N	Report	Report	XXX	Report	XXX	XXX	2/week	24-Hr Composite
Kjeldahl--N	Report	XXX	XXX	Report	XXX	XXX	2/week	24-Hr Composite
Nitrate-Nitrite as N	Report	XXX	XXX	Report	XXX	XXX	2/week	24-Hr Composite
Total Nitrogen	Report	Report	XXX	Report	XXX	XXX	1/month	Calculation
Total Phosphorus	Report	Report	XXX	Report	XXX	XXX	2/week	24-Hr Composite
Net Total Nitrogen	Report	27397	XXX	XXX	XXX	XXX	1/month	Calculation
Net Total Phosphorus	Report	3653	XXX	XXX	XXX	XXX	1/month	Calculation

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s):

at Outfall 001

6.3.1 Additional Permit Conditions for Operations Considerations

(1) Pre-Treatment:

See permit for pre-treatment conditions.

(2) CSO Requirements

(3) The facility has a SOP for operation during Peak Flow Management. This operational control protocol bypasses raw influent around the primary clarifier settling tanks to the SBR tank for the following reasons:

(a) during periods of peak flow that result from heavy rain and snow melt events. The partial bypass preformed in order to protect the primary settling tanks from hydraulic overload and potential overflow (Requested by the facility in the NPDES renewal application dated for December 17, 2019).

(b) during periods of low flow, the extended detention time in the primary tanks results is an excessive reduction in BOD in the effluent discharged from the primary settling tanks to the SBR tanks which can result in the starving of the biomass in the SBR's activated sludge. The bypassing procedure enables the operator to provide supplemental food source to the SBR treatment units in order to maintain a healthy biomass at the proper activated sludge concentrations or effective treatment. (Requested by the facility in the NPDES renewal application dated for December 17, 2019)

A Part C condition for Peak Flow shall be included in the NPDES permit. However, the Part C condition may be withdrawn subsequent to the completion of the separation of the CSO. The NPDES may be amended at that time.

6.3.2 Summary of Proposed Permit Part C Conditions

The subject facility has the following Part C conditions.

- CSO
- Pre-treatment
- SBR Batch Discharge Condition
- Peak Flow Management Plan / Bypass Primary Clarifier to SBR
- Hauled-in Waste Restrictions
- Chesapeake Bay Nutrient Definitions
- Solids Management for Non-Lagoon Treatment Systems
- Whole Effluent Toxicity – No Permit Limits
- Stormwater Requirements
- Connection of on-lot septic systems to the public sewer system.

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 (see Attachment)
☒	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: *New and Reissuance Sewage Individual NPDES Permit Applications, revised October 11, 2013*
☐	Other:

Attachment A

Stream Stats/Gauge Data

Table 1. List of U.S. Geological Survey streamgage locations in and near Pennsylvania with updated streamflow statistics.—Continued

[Latitude and Longitude in decimal degrees; mi², square miles]

Streamgage number	Streamgage name	Latitude	Longitude	Drainage area (mi²)	Regulated[1]
01561000	Brush Creek at Gapsville, Pa.	39.956	-78.254	36.8	N
01562000	Raystown Branch Juniata River at Saxton, Pa.	40.216	-78.265	756	N
01562500	Great Trough Creek near Marklesburg, Pa.	40.350	-78.130	84.6	N
01563200	Raystown Branch Juniata River below Rays Dam nr Huntingdon, Pa.	40.429	-77.991	960	Y
01563500	Juniata River at Mapleton Depot, Pa.	40.392	-77.935	2,030	Y
01564500	Aughwick Creek near Three Springs, Pa.	40.213	-77.925	205	N
01565000	Kishacoquillas Creek at Reedsville, Pa.	40.655	-77.583	164	N
01565700	Little Lost Creek at Oakland Mills, Pa.	40.605	-77.311	6.52	N
01566000	Tuscarora Creek near Port Royal, Pa.	40.515	-77.419	214	N
01566500	Cocolamus Creek near Millerstown, Pa.	40.566	-77.118	57.2	N
01567000	Juniata River at Newport, Pa.	40.478	-77.129	3,354	Y
01567500	Bixler Run near Loysville, Pa.	40.371	-77.402	15.0	N
01568000	Sherman Creek at Shermans Dale, Pa.	40.323	-77.169	207	N
01568500	Clark Creek near Carsonville, Pa.	40.460	-76.751	22.5	LF
01569000	Stony Creek nr Dauphin, Pa.	40.380	-76.907	33.2	N
01569800	Letort Spring Run near Carlisle, Pa.	40.235	-77.139	21.6	N
01570000	Conodoguinet Creek near Hogestown, Pa.	40.252	-77.021	470	LF
01570500	Susquehanna River at Harrisburg, Pa.	40.255	-76.886	24,100	Y
01571000	Paxton Creek near Penbrook, Pa.	40.308	-76.850	11.2	N
01571500	Yellow Breeches Creek near Camp Hill, Pa.	40.225	-76.898	213	N
01572000	Lower Little Swatara Creek at Pine Grove, Pa.	40.538	-76.377	34.3	N
01572025	Swatara Creek near Pine Grove, Pa.	40.533	-76.402	116	N
01572190	Swatara Creek near Inwood, Pa.	40.479	-76.531	167	N
01573000	Swatara Creek at Harper Tavern, Pa.	40.403	-76.577	337	N
01573086	Beck Creek near Cleona, Pa.	40.323	-76.483	7.87	N
01573160	Quittapahilla Creek near Bellegrove, Pa.	40.343	-76.562	74.2	N
01573500	Manada Creek at Manada Gap, Pa.	40.397	-76.709	13.5	N
01573560	Swatara Creek near Hershey, Pa.	40.298	-76.668	483	N
01574000	West Conewago Creek near Manchester, Pa.	40.082	-76.720	510	N
01574500	Codorus Creek at Spring Grove, Pa.	39.879	-76.853	75.5	Y
01575000	South Branch Codorus Creek near York, Pa.	39.921	-76.749	117	Y
01575500	Codorus Creek near York, Pa.	39.946	-76.755	222	Y
01576000	Susquehanna River at Marietta, Pa.	40.055	-76.531	25,990	Y
01576085	Little Conestoga Creek near Churchtown, Pa.	40.145	-75.989	5.82	N
01576500	Conestoga River at Lancaster, Pa.	40.050	-76.277	324	N
01576754	Conestoga River at Conestoga, Pa.	39.946	-76.368	470	N
01578310	Susquehanna River at Conowingo, Md.	39.658	-76.174	27,100	Y
01578400	Bowery Run near Quarryville, Pa.	39.895	-76.114	5.98	N
01580000	Deer Creek at Rocks, Md.	39.630	-76.403	94.4	N
01581500	Bynum Run at Bel Air, Md.	39.541	-76.330	8.52	N
01581700	Winters Run near Benson, Md.	39.520	-76.373	34.8	N
01582000	Little Falls at Blue Mount, Md.	39.604	-76.620	52.9	N
01582500	Gunpowder Falls at Glencoe, Md.	39.550	-76.636	160	Y
01583000	Slade Run near Glyndon, Md.	39.495	-76.795	2.09	N
01583100	Piney Run at Dover, Md.	39.521	-76.767	12.3	N

Table 2. Selected low-flow statistics for streamgage locations in and near Pennsylvania.—Continued

[ft³/s; cubic feet per second; —, statistic not computed; <, less than]

Streamgage number	Period of record used in analysis[1]	Number of years used in analysis	1-day, 10-year (ft³/s)	7-day, 10-year (ft³/s)	7-day, 2-year (ft³/s)	30-day, 10-year (ft³/s)	30-day, 2-year (ft³/s)	90-day, 10-year (ft³/s)
01546000	1912–1934	17	1.8	2.2	6.8	3.7	12.1	11.2
01546400	1986–2008	23	13.5	14.0	19.6	15.4	22.3	18.7
01546500	1942–2008	67	26.8	29.0	41.3	31.2	44.2	33.7
01547100	1969–2008	40	102	105	128	111	133	117
01547200	1957–2008	52	99.4	101	132	106	142	115
01547500	[2]1971–2008	38	28.2	109	151	131	172	153
01547500	[3]1956–1969	14	90.0	94.9	123	98.1	131	105
01547700	1957–2008	52	.5	.6	2.7	1.1	3.9	2.2
01547800	1971–1981	11	1.6	1.8	2.4	2.1	2.9	3.5
01547950	1970–2008	39	12.1	13.6	28.2	17.3	36.4	23.8
01548005	[2]1971–2000	25	142	151	206	178	241	223
01548005	[3]1912–1969	58	105	114	147	125	165	140
01548500	1920–2008	89	21.2	24.2	50.1	33.6	68.6	49.3
01549000	1910–1920	11	26.0	32.9	78.0	46.4	106	89.8
01549500	1942–2008	67	.6	.8	2.5	1.4	3.9	2.6
01549700	1959–2008	50	33.3	37.2	83.8	51.2	117	78.4
01550000	1915–2008	94	6.6	7.6	16.8	11.2	24.6	18.6
01551500	[2]1963–2008	46	520	578	1,020	678	1,330	919
01551500	[3]1901–1961	61	400	439	742	523	943	752
01552000	1927–2008	80	20.5	22.2	49.5	29.2	69.8	49.6
01552500	1942–2008	67	.9	1.2	3.1	1.7	4.4	3.3
01553130	1969–1981	13	1.0	1.1	1.5	1.3	1.8	1.7
01553500	[2]1968–2008	41	760	838	1,440	1,000	1,850	1,470
01553500	[3]1941–1966	26	562	619	880	690	1,090	881
01553700	1981–2008	28	9.1	10.9	15.0	12.6	17.1	15.2
01554000	[2]1981–2008	28	1,830	1,990	3,270	2,320	4,210	3,160
01554000	[3]1939–1979	41	1,560	1,630	2,870	1,880	3,620	2,570
01554500	1941–1993	53	16.2	22.0	31.2	25.9	35.7	31.4
01555000	1931–2008	78	33.5	37.6	58.8	43.4	69.6	54.6
01555500	1931–2008	78	4.9	6.5	18.0	9.4	24.3	16.6
01556000	1918–2008	91	43.3	47.8	66.0	55.1	75.0	63.7
01557500	1946–2008	63	2.8	3.2	6.3	4.2	8.1	5.8
01558000	1940–2008	69	56.3	59.0	79.8	65.7	86.2	73.7
01559000	1943–2008	66	104	177	249	198	279	227
01559500	1931–1958	28	9.3	10.5	15.0	12.4	17.8	15.8
01559700	1963–1978	16	.1	.1	.2	.1	.3	.2
01560000	1941–2008	68	8.5	9.4	15.6	12.0	20.2	16.2
01561000	1932–1958	27	.4	.5	1.6	.8	2.5	1.7
01562000	1913–2008	96	64.1	67.1	106	77.4	122	94.5
01562500	1931–1957	27	1.1	1.6	3.8	2.3	5.4	3.7
01563200	[2]1974–2008	35	—	—	—	112	266	129
01563200	[3]1948–1972	25	10.3	28.2	86.1	64.5	113	95.5
01563500	[2]1974–2008	35	384	415	519	441	580	493
01563500	[3]1939–1972	34	153	242	343	278	399	333
01564500	1940–2008	69	3.6	4.2	10.0	6.2	14.4	10.6

Attachment B

Modeling Input Values
WQM 7.0 Modeling Output Values
Toxic Management Spreadsheet

Master Input Sheet				
MA of the Borough of Bedford				
PA0022209				
December 2020				
General Data 1 (Modeling Point #1)	***Type***	***Default***	***Input Value***	***Units***
Stream Code	R		13349	
River Mile Index	R		91	miles
Elevation	R		1042	feet
Latitude			40.017617	
Longitude			-78.485636	
Drainage Area	R		161	sq miles
Reach Slope	O		Default	ft/ft
Low Flow Yield	R	0.1	0.0888	cfs/sq mile
Potable Water Supply Withdrawal	O	0	Default	mgd
General Data 2 (Modeling Point #2)	***Type***	***Default***	***Input Value***	***Units***
Stream Code	R		13349	
River Mile Index	R		89.56	miles
Elevation	R		1035	feet
Latitude			40.01101	
Longitude			-78.466217	
Drainage Area	R		358	sq miles
Reach Slope	O		Default	ft/ft
Low Flow Yield	R	0.1	0.0888	cfs/sq mile
Potable Water Supply Withdrawal	O	0	Default	mgd
General Data 3 (Modeling Point #3)	***Type***	***Default***	***Input Value***	***Units***
Stream Code	R		13349	
River Mile Index	R		85.89	miles
Elevation	R		1016	feet
Latitude			40.014659	
Longitude			-78.425705	
Drainage Area	R		368	sq miles
Reach Slope	O		Default	ft/ft
Low Flow Yield	R	0.1	0.0888	cfs/sq mile
Potable Water Supply Withdrawal	O	0	Default	mgd

General Data 4 (Modeling Point #4)	***Type***	***Default***	***Input Value***	***Units***
Stream Code	R		13349	
River Mile Index	R		88.2	miles
Elevation	R		1029	feet
Latitude			40.017378	
Longitude			-78.44782	
Drainage Area	R		364	sq miles
Reach Slope	O		Default	ft/ft
Low Flow Yield	R	0.1	0.0888	cfs/sq mile
Potable Water Supply Withdrawal	O	0	Default	mgd
Hydrodynamic and Related Data	***Type***	***Default***	***Input Value***	***Units***
Tributary Flow	O		Default	cfs
Stream Flow	O		Default	cfs
Tributary Temperature	R	20	23.3	C
Tributary pH	R	7	8	pH units
Stream Temperature	O		Default	C
Stream pH	O		Default	pH Units
Tributary Hardness	R (Pentox)	100	121.3	mg/l
Discharge Data	***Type***	***Default***	***Input Value***	***Units***
Discharge Name	R		MA of Borough of Bedford	15 character
Permit Number	R		PA0022209	PA0000000
Existing Discharge Flow	R		1.5	mgd
Permitted Discharge Flow	R		1.5	mgd
Design Discharge Flow	R		1.5	mgd
Reserve Factor	O	0	Default	decimal percent
Discharge Temperature	R	25	20	C
Discharge pH	R	7	7.18	pH units
Discharge Hardness	R (Pentox)	100	191	mg/l

Discharge Data	*Type*	*Default*	*Input Value*	*Units*
Discharge Name	R		Snake Spring	15 character
Permit Number	R		PA0084077	PA0000000
Existing Discharge Flow	R		0.28	mgd
Permitted Discharge Flow	R		0.28	mgd
Design Discharge Flow	R		0.28	mgd
Reserve Factor	O	0	Default	decimal percent
Discharge Temperature	R	25	20	C
Discharge pH	R	7	7.28	pH units
Discharge Hardness	R (Pentox)	100	Default	mg/l

Parameter Data	*Type*	*Default*	*Input Value*	*Units*
CBOD				
Average Discharge Concentration	R	25	20	mg/l
Tributary Concentration	R	2	Default	mg/l
Stream Concentration	O		Default	mg/l
Discharge Deoxygenation Rate	R	1.5	Default	1/day
NH3-N				
Average Discharge Concentration	R	25	7.5	mg/l
Tributary Concentration	R	0	Default	mg/l
Stream Concentration	O		Default	mg/l
Stream Nitrification Rate	R	0.7	Default	1/day
DO				
Average Discharge Concentration	R	3	5	mg/l
Tributary Concentration	R	Calculated	Default	mg/l
Stream Concentration	O		Default	mg/l
Stream Reaeration Rate	O		Default	1/day
Tributary Saturation	R	90	Default	percent

Model Specifications	*Type*	*Default*	*Input Value*	*Units*
Parameters (DO/NH3-N)	R	Both	Both	NH3-N/DO/Both
WLA Method	R	EMPR	EMPR	UT/EMPR/DO
Use entered Q1-10 and Q30-10 data	R	Yes	Yes	Yes/No
Default Q1-10 /Q7-10 ratio	R	0.64	0.96	Dimensionless
Default Q30-10 / Q7-10 ratio	R	1.6	1.15	Dimensionless
Use input reach width/depth ratios	R	No	Default	Yes/No
Use input reach travel times	R	No	Default	Yes/No
Temperature Adjust Kr	R	Yes	Default	Yes/No
Default DO Goal	R	6	5	mg/l
Use Balanced Technology	R	Yes	Yes	Yes/No
Number of Samples for PENTOXSD	R	-----	4	Dimensionless

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Toxics Management Spreadsheet
Version 1.1, October 2020

Discharge Information

Instructions | Discharge | Stream

Facility: **MA of Borough of Bedford** NPDES Permit No.: **PA0022209** Outfall No.: **001**

Evaluation Type **Major Sewage / Industrial Waste** Wastewater Description:

Discharge Characteristics								
Design Flow (MGD)*	Hardness (mg/l)*	pH (SU)*	Partial Mix Factors (PMFs)				Complete Mix Times (min)	
			AFC	CFC	THH	CRL	Q_{7-10}	Q_h
1.5	191	7.18						

					0 if left blank		0.5 if left blank		0 if left blank			1 if left blank	
	Discharge Pollutant	Units	Max Discharge Conc		Trib Conc	Stream Conc	Daily CV	Hourly CV	Stream CV	Fate Coeff	FOS	Criteria Mod	Chem Transl
Group 1	Total Dissolved Solids (PWS)	mg/L		366									
	Chloride (PWS)	mg/L		85.2									
	Bromide	mg/L	<	0.2									
	Sulfate (PWS)	mg/L		63.6									
	Fluoride (PWS)	mg/L											
Group 2	Total Aluminum	µg/L		11.4									
	Total Antimony	µg/L		0.377									
	Total Arsenic	µg/L	<	1									
	Total Barium	µg/L		27.9									
	Total Beryllium	µg/L	<	1									
	Total Boron	µg/L		226									
	Total Cadmium	µg/L		0.334									
	Total Chromium (III)	µg/L	<	4									
	Hexavalent Chromium	µg/L	<	0.25									
	Total Cobalt	µg/L		1.06									
	Total Copper	µg/L		11.3									
	Free Cyanide	µg/L	<	5									
	Total Cyanide	µg/L	<	10									
	Dissolved Iron	µg/L		115									
	Total Iron	µg/L		368									
	Total Lead	µg/L		0.232									
	Total Manganese	µg/L		91.6									
	Total Mercury	µg/L	<	0.2									
	Total Nickel	µg/L		6.74									
	Total Phenols (Phenolics) (PWS)	µg/L	<	5									
	Total Selenium	µg/L		0.61									
	Total Silver	µg/L	<	0.4									
	Total Thallium	µg/L	<	0.1									
	Total Zinc	µg/L		33.7									
	Total Molybdenum	µg/L		26.4									
	Acrolein	µg/L	<	2									
	Acrylamide	µg/L	<										
	Acrylonitrile	µg/L	<	1									
	Benzene	µg/L	<	0.5									
	Bromoform	µg/L	<	0.5									
	Carbon Tetrachloride	µg/L	<	0.51									
	Chlorobenzene	µg/L		0.5									
	Chlorodibromomethane	µg/L	<	0.5									
	Chloroethane	µg/L	<	0.5									
	2-Chloroethyl Vinyl Ether	µg/L	<	5									

Group 3	Chloroform	µg/L		1.13										
	Dichlorobromomethane	µg/L	<	0.5										
	1,1-Dichloroethane	µg/L	<	0.5										
	1,2-Dichloroethane	µg/L	<	0.5										
	1,1-Dichloroethylene	µg/L	<	0.5										
	1,2-Dichloropropane	µg/L	<	0.52										
	1,3-Dichloropropylene	µg/L	<	0.5										
	1,4-Dioxane	µg/L	<	10										
	Ethylbenzene	µg/L	<	0.5										
	Methyl Bromide	µg/L	<	0.5										
	Methyl Chloride	µg/L	<	0.5										
	Methylene Chloride	µg/L	<	0.5										
	1,1,2,2-Tetrachloroethane	µg/L	<	0.5										
	Tetrachloroethylene	µg/L	<	0.5										
	Toluene	µg/L	<	0.5										
	1,2-trans-Dichloroethylene	µg/L	<	0.5										
	1,1,1-Trichloroethane	µg/L	<	0.5										
	1,1,2-Trichloroethane	µg/L	<	0.5										
	Trichloroethylene	µg/L	<	0.52										
	Vinyl Chloride	µg/L	<	0.5										
Group 4	2-Chlorophenol	µg/L	<	1										
	2,4-Dichlorophenol	µg/L	<	1										
	2,4-Dimethylphenol	µg/L	<	1										
	4,6-Dinitro-o-Cresol	µg/L	<	5										
	2,4-Dinitrophenol	µg/L	<	5										
	2-Nitrophenol	µg/L	<	1										
	4-Nitrophenol	µg/L	<	1										
	p-Chloro-m-Cresol	µg/L	<	1										
	Pentachlorophenol	µg/L	<	5										
	Phenol	µg/L	<	1										
	2,4,6-Trichlorophenol	µg/L	<	1										
Group 5	Acenaphthene	µg/L	<	1										
	Acenaphthylene	µg/L	<	1										
	Anthracene	µg/L	<	1										
	Benzidine	µg/L	<	5										
	Benzo(a)Anthracene	µg/L	<	1										
	Benzo(a)Pyrene	µg/L	<	1										
	3,4-Benzofluoranthene	µg/L	<	1										
	Benzo(ghi)Perylene	µg/L	<	1										
	Benzo(k)Fluoranthene	µg/L	<	1										
	Bis(2-Chloroethoxy)Methane	µg/L	<	1										
	Bis(2-Chloroethyl)Ether	µg/L	<	1										
	Bis(2-Chloroisopropyl)Ether	µg/L	<	1										
	Bis(2-Ethylhexyl)Phthalate	µg/L	<	1										
	4-Bromophenyl Phenyl Ether	µg/L	<	1										
	Butyl Benzyl Phthalate	µg/L	<	1										
	2-Chloronaphthalene	µg/L	<	1										
	4-Chlorophenyl Phenyl Ether	µg/L	<	1										
	Chrysene	µg/L	<	1										
	Dibenzo(a,h)Anthrancene	µg/L	<	1										
	1,2-Dichlorobenzene	µg/L	<	1										
	1,3-Dichlorobenzene	µg/L	<	1										
	1,4-Dichlorobenzene	µg/L	<	1										
	3,3-Dichlorobenzidine	µg/L	<	1										
	Diethyl Phthalate	µg/L	<	1										
	Dimethyl Phthalate	µg/L	<	1										
	Di-n-Butyl Phthalate	µg/L		0.68										
	2,4-Dinitrotoluene	µg/L	<	1										
	2,6-Dinitrotoluene	µg/L	<	1										
	Di-n-Octyl Phthalate	µg/L	<	1										
	1,2-Diphenylhydrazine	µg/L	<	1										
	Fluoranthene	µg/L	<	1										
	Fluorene	µg/L	<	1										
	Hexachlorobenzene	µg/L	<	1										
	Hexachlorobutadiene	µg/L	<	1										
	Hexachlorocyclopentadiene	µg/L	<	1										
	Hexachloroethane	µg/L	<	1										
	Indeno(1,2,3-cd)Pyrene	µg/L	<	1										

	Isophorone	µg/L	<	1										
	Naphthalene	µg/L	<	1										
	Nitrobenzene	µg/L	<	1										
	n-Nitrosodimethylamine	µg/L	<	1										
	n-Nitrosodi-n-Propylamine	µg/L	<	1										
	n-Nitrosodiphenylamine	µg/L	<	1										
	Phenanthrene	µg/L	<	1										
	Pyrene	µg/L	<	1										
	1,2,4-Trichlorobenzene	µg/L	<	1										
Group 6	Aldrin	µg/L	<											
	alpha-BHC	µg/L	<											
	beta-BHC	µg/L	<											
	gamma-BHC	µg/L	<											
	delta BHC	µg/L	<											
	Chlordane	µg/L	<											
	4,4-DDT	µg/L	<											
	4,4-DDE	µg/L	<											
	4,4-DDD	µg/L	<											
	Dieldrin	µg/L	<											
	alpha-Endosulfan	µg/L	<											
	beta-Endosulfan	µg/L	<											
	Endosulfan Sulfate	µg/L	<											
	Endrin	µg/L	<											
	Endrin Aldehyde	µg/L	<											
	Heptachlor	µg/L	<											
	Heptachlor Epoxide	µg/L	<											
	PCB-1016	µg/L	<											
	PCB-1221	µg/L	<											
	PCB-1232	µg/L	<											
	PCB-1242	µg/L	<											
	PCB-1248	µg/L	<											
	PCB-1254	µg/L	<											
	PCB-1260	µg/L	<											
	PCBs, Total	µg/L	<											
	Toxaphene	µg/L	<											
	2,3,7,8-TCDD	ng/L	<											
Group 7	Gross Alpha	pCi/L												
	Total Beta	pCi/L	<											
	Radium 226/228	pCi/L	<											
	Total Strontium	µg/L	<											
	Total Uranium	µg/L	<											
	Osmotic Pressure	mOs/kg												

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DEPARTMENT OF ENVIRONMENTAL PROTECTION

Toxics Management Spreadsheet
Version 1.1, October 2020

Stream / Surface Water Information

MA of Borough of Bedford, NPDES Permit No. PA0022209, Outfall 001

Instructions | Discharge | Stream

Receiving Surface Water Name: **Raystown Branch Juniata River**

No. Reaches to Model: 1

- (●) Statewide Criteria
- ( ) Great Lakes Criteria
- ( ) ORSANCO Criteria

Location	Stream Code*	RMI*	Elevation (ft)*	DA (mi²)*	Slope (ft/ft)	PWS Withdrawal (MGD)	Apply Fish Criteria*
Point of Discharge	013349	91	1042	161			Yes
End of Reach 1	013349	85.89	1016	368			Yes

$Q_{7\text{-}10}$

Location	RMI	LFY (cfs/mi²)*	Flow (cfs)		W/D Ratio	Width (ft)	Depth (ft)	Velocity (fps)	Travel Time	Tributary		Stream		Analysis	
			Stream	Tributary						Hardness	pH	Hardness*	pH*	Hardness	pH
Point of Discharge	91	0.0888										121.3	8		
End of Reach 1	85.89	0.0888										121.3	8		

Q_h

Location	RMI	LFY (cfs/mi²)	Flow (cfs)		W/D Ratio	Width (ft)	Depth (ft)	Velocity (fps)	Travel Time	Tributary		Stream		Analysis	
			Stream	Tributary						Hardness	pH	Hardness	pH	Hardness	pH
Point of Discharge	91														
End of Reach 1	85.89														

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Toxics Management Spreadsheet
Version 1.1, October 2020

Model Results

MA of Borough of Bedford, NPDES Permit No. PA0022209, Outfall 001

Instructions | Results | RETURN TO INPUTS | SAVE AS PDF | PRINT | (●) All ( ) Inputs ( ) Results ( ) Limits

☐ ***Hydrodynamics***

☐ ***Wasteload Allocations***

☑ ***Recommended WQBELs & Monitoring Requirements***

No. Samples/Month: 4

	Mass Limits		*Concentration Limits*						
Pollutants	AML (lbs/day)	MDL (lbs/day)	AML	MDL	IMAX	Units	Governing WQBEL	WQBEL Basis	Comments
Total Cadmium	Report	Report	Report	Report	Report	µg/L	2.37	CFC	Discharge Conc > 10% WQBEL (no RP)
Total Copper	Report	Report	Report	Report	Report	µg/L	35.5	AFC	Discharge Conc > 10% WQBEL (no RP)
Total Zinc	Report	Report	Report	Report	Report	µg/L	293	AFC	Discharge Conc > 10% WQBEL (no RP)

☐ ***Other Pollutants without Limits or Monitoring***

Appendix C
WET Testing Results

DEP Whole Effluent Toxicity (WET) Analysis Spreadsheet

Type of Test	Chronic
Species Tested	Ceriodaphnia
Endpoint	Survival
TIWC (decimal)	0.14
No. Per Replicate	1
TST b value	0.75
TST alpha value	0.2

Facility Name
MABB Bedford Wastewater Treatment Plant

Permit No.
PA0022209

Test Completion Date 9/19/2016

Replicate No.	Control	TIWC
1	1	1
2	1	1
3	1	1
4	1	1
5	1	1
6	1	1
7	1	1
8	1	1
9	1	1
10	1	1
11		
12		
13		
14		
15		
Mean	1.000	1.000
Std Dev.	0.000	0.000
# Replicates	10	10

T-Test Result
Deg. of Freedom
Critical T Value
Pass or Fail **PASS**

Test Completion Date 9/4/2017

Replicate No.	Control	TIWC
1	1	1
2	1	1
3	1	1
4	1	1
5	1	1
6	1	1
7	1	1
8	1	1
9	1	1
10	1	1
11		
12		
13		
14		
15		
Mean	1.000	1.000
Std Dev.	0.000	0.000
# Replicates	10	10

T-Test Result
Deg. of Freedom
Critical T Value
Pass or Fail **PASS**

Test Completion Date 10/18/2018

Replicate No.	Control	TIWC
1	1	1
2	1	1
3	1	1
4	1	1
5	1	1
6	1	1
7	1	1
8	1	1
9	1	1
10	1	1
11		
12		
13		
14		
15		
Mean	1.000	1.000
Std Dev.	0.000	0.000
# Replicates	10	10

T-Test Result
Deg. of Freedom
Critical T Value
Pass or Fail **PASS**

Test Completion Date 9/17/2019

Replicate No.	Control	TIWC
1	1	1
2	1	1
3	1	1
4	1	1
5	1	1
6	1	1
7	1	1
8	1	1
9	1	1
10	1	1
11		
12		
13		
14		
15		
Mean	1.000	1.000
Std Dev.	0.000	0.000
# Replicates	10	10

T-Test Result
Deg. of Freedom
Critical T Value
Pass or Fail **PASS**

DEP Whole Effluent Toxicity (WET) Analysis Spreadsheet

Type of Test	Chronic
Species Tested	Ceriodaphnia
Endpoint	Reproduction
TIWC (decimal)	0.14
No. Per Replicate	1
TST b value	0.75
TST alpha value	0.2

Facility Name
MABB Bedford Wastewater Treatment Plant

Permit No.
PA0022209

Test Completion Date: 9/19/2016

Replicate No.	Control	TIWC
1	39	42
2	39	43
3	39	39
4	39	42
5	43	42
6	37	42
7	39	44
8	38	44
9	42	37
10	43	41
11		
12		
13		
14		
15		
Mean	39.800	41.600
Std Dev.	2.098	2.171
# Replicates	10	10

T-Test Result	13.8609
Deg. of Freedom	16
Critical T Value	0.8647
Pass or Fail	PASS

Test Completion Date: 9/4/2017

Replicate No.	Control	TIWC
1	19	32
2	27	36
3	34	32
4	38	39
5	37	36
6	37	34
7	28	34
8	39	31
9	29	36
10	32	38
11		
12		
13		
14		
15		
Mean	32.000	34.600
Std Dev.	6.307	2.459
# Replicates	10	10

T-Test Result	6.2878
Deg. of Freedom	17
Critical T Value	0.8633
Pass or Fail	PASS

Test Completion Date: 10/8/2018

Replicate No.	Control	TIWC
1	35	16
2	27	20
3	30	33
4	20	30
5	24	28
6	27	27
7	28	27
8	33	32
9	30	29
10	21	30
11		
12		
13		
14		
15		
Mean	27.500	27.200
Std Dev.	4.836	5.308
# Replicates	10	10

T-Test Result	3.2340
Deg. of Freedom	16
Critical T Value	0.8647
Pass or Fail	PASS

Test Completion Date: 9/17/2019

Replicate No.	Control	TIWC
1	41	31
2	44	35
3	41	32
4	38	36
5	36	30
6	31	36
7	37	32
8	32	32
9	35	34
10	38	26
11		
12		
13		
14		
15		
Mean	37.300	32.400
Std Dev.	4.057	3.062
# Replicates	10	10

T-Test Result	3.2416
Deg. of Freedom	17
Critical T Value	0.8633
Pass or Fail	PASS

DEP Whole Effluent Toxicity (WET) Analysis Spreadsheet

Type of Test	Chronic
Species Tested	Pimephales
Endpoint	Survival
TIWC (decimal)	0.14
No. Per Replicate	10
TST b value	0.75
TST alpha value	0.25

Facility Name
MABB Bedford Wastewater Treatment Plant

Permit No.
PA0022209

Test Completion Date: 9/20/2016

Replicate No.	Control	TIWC
1	10	10
2	10	10
3	10	10
4	10	10
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
Mean	10.000	10.000
Std Dev.	0.000	0.000
# Replicates	4	4

T-Test Result
Deg. of Freedom
Critical T Value
Pass or Fail: **PASS**

Test Completion Date: 9/6/2017

Replicate No.	Control	TIWC
1	10	10
2	10	10
3	10	10
4	10	8
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
Mean	10.000	9.500
Std Dev.	0.000	1.000
# Replicates	4	4

T-Test Result: 3.6316
Deg. of Freedom: 3
Critical T Value: 0.7649
Pass or Fail: **PASS**

Test Completion Date: 10/9/2018

Replicate No.	Control	TIWC
1	10	10
2	10	10
3	10	10
4	9	10
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
Mean	9.750	10.000
Std Dev.	0.500	0.000
# Replicates	4	4

T-Test Result: 12.5523
Deg. of Freedom: 3
Critical T Value: 0.7649
Pass or Fail: **PASS**

Test Completion Date: 9/17/2019

Replicate No.	Control	TIWC
1	10	10
2	9	10
3	9	10
4	10	8
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
Mean	9.500	9.500
Std Dev.	0.577	1.000
# Replicates	4	4

T-Test Result: 4.0232
Deg. of Freedom: 4
Critical T Value: 0.7407
Pass or Fail: **PASS**

DEP Whole Effluent Toxicity (WET) Analysis Spreadsheet

Type of Test	Chronic
Species Tested	Pimephales
Endpoint	Growth
TIWC (decimal)	0.14
No. Per Replicate	10
TST b value	0.75
TST alpha value	0.25

Facility Name
MABB Bedford Wastewater Treatment Plant

Permit No.
PA0022209

Test Completion Date: 9/20/2016

Replicate No.	Control	TIWC
1	0.429	0.531
2	0.511	0.504
3	0.504	0.564
4	0.466	0.475
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
Mean	0.478	0.519
Std Dev.	0.038	0.038
# Replicates	4	4

T-Test Result	6.7606
Deg. of Freedom	5
Critical T Value	0.7267
Pass or Fail	PASS

Test Completion Date: 9/5/2017

Replicate No.	Control	TIWC
1	0.402	0.497
2	0.429	0.4
3	0.479	0.444
4	0.457	0.379
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
Mean	0.442	0.430
Std Dev.	0.033	0.052
# Replicates	4	4

T-Test Result	3.4055
Deg. of Freedom	4
Critical T Value	0.7407
Pass or Fail	PASS

Test Completion Date: 10/9/2018

Replicate No.	Control	TIWC
1	0.416	0.435
2	0.367	0.423
3	0.422	0.525
4	0.476	0.438
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
Mean	0.420	0.455
Std Dev.	0.045	0.047
# Replicates	4	4

T-Test Result	4.8597
Deg. of Freedom	5
Critical T Value	0.7267
Pass or Fail	PASS

Test Completion Date: 9/17/2019

Replicate No.	Control	TIWC
1	0.319	0.456
2	0.324	0.434
3	0.374	0.496
4	0.446	0.393
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
Mean	0.366	0.445
Std Dev.	0.059	0.043
# Replicates	4	4

T-Test Result	5.5255
Deg. of Freedom	5
Critical T Value	0.7267
Pass or Fail	PASS