pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Northcentral Regional Office
CLEAN WATER PROGRAM

Application Type	**Renewal**	Application No.	**PA0021881**
Facility Type	**Municipal**	APS ID	**1012597**
Major / Minor	**Minor**	Authorization ID	**1307591**

NPDES PERMIT FACT SHEET
INDIVIDUAL SEWAGE

Applicant and Facility Information

Applicant Name	**Westfield Borough Tioga County**	Facility Name	**Westfield Borough Sewer System STP**
Applicant Address	429 E Main Street	Facility Address	1488 Broughton Road
	Westfield, PA 16950-1610		Westfield, PA 16950
Applicant Contact	Gail Bollinger, President	Facility Contact	Donald Wescott, Operator
Applicant Phone	(814) 367-2632	Facility Phone	(814) 367-5835
Client ID	63260	Site ID	255822
Ch 94 Load Status	Not Overloaded	Municipality	Westfield Borough
Connection Status	No Limitations	County	Tioga
Date Application Received	March 2, 2020	EPA Waived?	No
Date Application Accepted	March 5, 2020	If No, Reason	Significant CB Discharge

Purpose of Application: Renewal of a NPDES Permit

Summary of Review

The subject facility is a Publicly Owned Treatment Works (POTW) serving Westfield Borough and a neighboring portion of Westfield Township in Tioga County.

A map of the discharge location is attached.

Public Participation

DEP will publish notice of the receipt of the NPDES permit application and a tentative decision to issue the individual NPDES permit in the *Pennsylvania Bulletin* in accordance with 25 Pa. Code § 92a.82. Upon publication in the *Pennsylvania Bulletin*, DEP will accept written comments from interested persons for a 30-day period (which may be extended for one additional 15-day period at DEP's discretion), which will be considered in making a final decision on the application. Any person may request or petition for a public hearing with respect to the application. A public hearing may be held if DEP determines that there is significant public interest in holding a hearing. If a hearing is held, notice of the hearing will be published in the *Pennsylvania Bulletin* at least 30 days prior to the hearing and in at least one newspaper of general circulation within the geographical area of the discharge.

Approve	Deny	Signatures	Date
X		*Keith C. Allison* Keith C. Allison / Project Manager	July 13, 2020
X		*Nicholas W. Hartranft* Nicholas W. Hartranft, P.E. / Environmental Engineer Manager	July 14, 2020

Discharge, Receiving Waters and Water Supply Information

Outfall No.	001	Design Flow (MGD)	0.46
Latitude	41º 55' 30.06"	Longitude	-77º 31' 16.37"
Quad Name	Potter Brook	Quad Code	0325
Wastewater Description:	Sewage Effluent		
Receiving Waters	Cowanesque River (WWF)	Stream Code	30995
NHD Com ID	57350897	RMI	27.6
Drainage Area	96.8 mi^2	Yield (cfs/mi^2)	0.01325
Q_{7-10} Flow (cfs)	1.28	Q_{7-10} Basis	USGS Gage 01518862, Cowanesque River @ Westfield (1985-2008)
Elevation (ft)	1311	Slope (ft/ft)	0.00174
Watershed No.	4-A	Chapter 93 Class.	WWF
Existing Use	N/A	Existing Use Qualifier	N/A
Exceptions to Use	None	Exceptions to Criteria	None
Assessment Status	Impaired		
Cause(s) of Impairment	Cause Unknown, Thermal Modifications, Siltation		
Source(s) of Impairment	Industrial Point Source, Removal of Vegetation		
TMDL Status	Pending	Name	
Nearest Downstream Public Water Supply Intake	PA-NY State Line		
PWS Waters	Cowanesque River	Distance from Outfall (mi)	Approx. 27

Changes Since Last Permit Issuance: None. The above stream and drainage characteristics were determined for the previous review and remain adequate.

Other Comments: The facility is not expected to be a significant contributor to the above-listed impairment to the Cowanesque River. The facility's TSS typically averages below 10 mg/L. In addition, the impairment dates to surveys in 1999 and may have been attributable to the former leather tannery in Westfield which ceased discharging in 2005.

The discharge is not expected to affect any downstream water supply at this time with the limitations and monitoring proposed. The Department considers the PA/NY state line to the closest water supply due to no closer intakes.

Treatment Facility Summary

Treatment Facility Name: Westfield Borough

WQM Permit No.	Issuance Date	Permit For:
5986401	9/26/88	Upgrade to original plant with inclusion of experimental Submerged Fixed Film Reactor (SFFR)
5986401 A-1	4/25/19	Plant upgrades

Waste Type	Degree of Treatment	Process Type	Disinfection	Avg Annual Flow (MGD)
Sewage	Secondary	Oxidation Ditch	Hypochlorite	0.46

Hydraulic Capacity (MGD)	Organic Capacity (lbs/day)	Load Status	Biosolids Treatment	Biosolids Use/Disposal
0.46	264	Not Overloaded	Dewatering	Land Application

Changes Since Last Permit Issuance: Issuance of WQM Permit Amendment No. 5986401 A-1 for upgrades including a mechanical screen and a manually cleaned bar, a new headworks structure, aerated grit removal system, an influent duplex pump station with a 6' diameter wet well and two (2) 7.5 HP submersible pumps, an oxidation ditch, two (2) 52,873-gallon circular clarifiers, the existing treatment tanks will be converted into two (2) aerobic sludge digestion tanks by installing coarse bubble diffusers, positive displacement blowers, and peristaltic pumps, three (3) chemical feed systems peristaltic-type metering pumps, a new chlorine dosing pump, the existing clarifiers will be converted to chlorine contact tanks with the installation of baffles, and a post aeration system consisting of two (2) centrifugal blowers, fine bubble diffusers, and a post aeration tank. Construction for these upgrades has not commenced.

Other Comments: The plant was originally built in 1954 (only primary treatment) with upgrades in 1988 under WQM Permit No. 5986401. The treatment, as permitted under WQM Permit No. 5986401, currently includes manual bar screens, grit chambers, ferric chloride addition, primary clarification, aerated bioreactors, secondary clarification, hypochlorite disinfection with contact tank, post-aeration, aerated sludge digester, sludge drying beds and sludge storage.

Sludge/Biosolids Disposal

The facility's sludge is disposed offsite in New York State. Per the application, approximately 21 dry tons of sludge were disposed in the previous year.

Hauled in Waste

Per the application, the permittee has not received any hauled-in wastes over the past three years and does not anticipate receiving any over the next permit term.

Industrial Users

The facility receives no flows from any industrial users. All flows are residential or commercial users.

Compliance History

DMR Data for Outfall 001 (from June 1, 2019 to May 31, 2020)

Parameter	MAY-20	APR-20	MAR-20	FEB-20	JAN-20	DEC-19	NOV-19	OCT-19	SEP-19	AUG-19	JUL-19	JUN-19
Flow (MGD) Average Monthly	0.324	0.333	0.316	0.357	0.308	0.298	0.286	0.195	0.161	0.151	0.222	0.267
Flow (MGD) Daily Maximum	0.614	0.416	0.449	0.448	0.357	0.413	0.695	0.294	0.213	0.217	0.314	0.345
pH (S.U.) Minimum	7.0	7.1	7.0	7.0	7.1	7.1	7.0	6.9	6.8	7.0	7.0	7.0
pH (S.U.) Maximum	7.3	7.4	7.3	7.3	7.3	7.3	7.2	7.1	7.1	7.3	7.2	7.2
DO (mg/L) Minimum	5.18	5.63	6.11	4.15	4.33	4.56	5.06	3.79	4.57	4.86	4.30	4.17
TRC (mg/L) Average Monthly	0.19	0.19	0.19	0.17	0.19	0.18	0.17	0.17	0.14	0.15	0.13	0.16
TRC (mg/L) Instantaneous Maximum	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
CBOD5 (lbs/day) Average Monthly	5.8	5.91	5.34	5.59	5.54	5.21	4.99	4.31	3.0	2.4	2.38	3.42
CBOD5 (lbs/day) Weekly Average	7.3	7.63	5.50	6.64	6.22	6.43	6.15	6.11	3.14	3.18	3.9	2.7
CBOD5 (mg/L) Average Monthly	2.2	< 2.1	< 2.2	< 2.0	< 2.1	< 2.1	< 2.36	2.5	2.15	2.1	1.24	1
CBOD5 (mg/L) Weekly Average	2.2	< 2.2	< 2.2	< 2.2	2.2	< 2.2	< 2.4	< 3.5	< 2.2	2.5	2.2	1
BOD5 (lbs/day) Raw Sewage Influent Average Monthly	140	131	146	233	201	230	165	129	155	140	175	136
BOD5 (lbs/day) Raw Sewage Influent Daily Maximum	158	186	188	384	260	311	209	205	200	161	266	165
BOD5 (mg/L) Raw Sewage Influent Average Monthly	56	46	62	85	77	95	77	79	115	120	93	62
TSS (lbs/day) Average Monthly	35.1	21.36	23.29	26.12	20.06	21.65	19.81	14.13	8.6	13.2	17.8	30

TSS (lbs/day) Raw Sewage Influent Average Monthly	118	114	145	212	155	196	135	116	102	113	150	125
TSS (lbs/day) Raw Sewage Influent Daily Maximum	132	163	174	349	187	306	145	142	122	156	269	158
TSS (lbs/day) Weekly Average	46.8	27.76	32.53	43.55	31.12	26.94	26.92	17.11	11.63	18.56	26.1	28
TSS (mg/L) Average Monthly	13.0	7.6	9.5	9.0	7.75	8.80	9.0	8.4	6.2	11.3	9.0	10
TSS (mg/L) Raw Sewage Influent Average Monthly	46	39	62	77	60	79	62	70	75	96	74	55
TSS (mg/L) Weekly Average	17.0	11.0	13.0	14	12.0	10.0	12.0	10.0	9.0	16	11	13
Fecal Coliform (CFU/100 ml) Geometric Mean	< 3.0	< 3	< 3	< 2.7	1.4	< 2	1.69	1.0	1	1.0	< 1	1
Fecal Coliform (CFU/100 ml) Instantaneous Maximum	40.4	33.2	31.8	52.9	4.1	3.1	4.1	1.0	< 1	1.0	2.0	2
Nitrate-Nitrite (mg/L) Average Monthly	5.3	3.9	3.88	5.71	7.0	6.6	8.34	8.2	8.98	8.85	6.09	7.0
Nitrate-Nitrite (lbs) Total Monthly	406.1	330.0	316.20	486.00	561.10	558	549	412.3	365.40	344.10	357.43	457.8
Total Nitrogen (mg/L) Average Monthly	< 7.6	5.8	6.44	8.10	8.8	8.71	10.0	10	11.15	11.10	7.93	7.8
Total Nitrogen (lbs) Effluent Net Total Monthly	585.9	483.0	517.70	681.50	703.70	669.60	669	508.4	457.20	430.59	465.62	529.5
Total Nitrogen (lbs) Total Monthly	< 585.9	483.0	517.70	681.50	703.70	669.60	669	508.4	457.20	430.59	465.62	529.5
Ammonia (lbs/day) Average Monthly	< 1.2	2.8	4.00	2.33	0.83	0.79	5.8	0.7	0.43	0.31	1.01	0.54
Ammonia (lbs/day) Weekly Average	1.8	4.0	5.7	4.6	1.1	1.1	1.1	1.6	0.7	0.6	2.5	0.8
Ammonia (mg/L) Average Monthly	0.46	1.0	1.59	0.79	0.33	0.33	0.33	0.37	0.31	0.46	0.53	0.25
Ammonia (mg/L) Weekly Average	0.66	1.6	2.3	1.7	0.46	0.53	0.52	0.78	0.59	0.37	1.3	0.32
Ammonia (lbs) Total Monthly	37.2	84.0	124.00	67.57	25.73	24.49	174	21.7	12.90	9.61	31.31	16.2

TKN (mg/L) Average Monthly	2.3	1.84	2.46	2.30	1.8	1.65	13.6	1.8	2.18	2.25	1.84	1.08
TKN (lbs) Total Monthly	176.8	153.0	201.50	195.5	142.6	111.60	120	96.1	91.20	86.49	108.19	71.70
Total Phosphorus (lbs/day) Average Monthly	2.1	2.8	2.11	2.6	2.2	2.3	1.8	1.7	1.25	1.2	1.83	2.06
Total Phosphorus (lbs/day) Weekly Average	3.3	3.7	2.7	3.1	2.8	4.0	2.4	2.9	1.9	1.9	2.5	2.7
Total Phosphorus (mg/L) Average Monthly	0.86	1.0	0.81	0.87	0.84	0.92	0.81	1.0	0.9	0.97	0.99	0.93
Total Phosphorus (mg/L) Weekly Average	1.2	1.5	1.0	0.94	1.0	1.4	1.0	1.2	1.1	1.2	1.2	1.1
Total Phosphorus (lbs) Effluent Net Total Monthly	66.0	84.0	65.41	74.82	68.2	71.3	54.3	52.7	37.5	37.20	56.73	61.8
Total Phosphorus (lbs) Total Monthly	66.0	84.0	65.41	74.82	68.2	71.3	54.3	52.7	37.5	37.20	56.73	61.8

Compliance History, Cont'd	
Summary of Inspections:	The facility has been inspected at least annually by the Department over the past term. The most recent inspection of the facility on June 24, 2020 noted no violations at the time of inspection.
Other Comments	A query in WMS found no open violations in eFACTS for Westfield Borough.

Existing Effluent Limitations and Monitoring Requirements

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly	Weekly Average	Minimum	Average Monthly	Weekly Average	Instant. Maximum		
Flow (MGD)	Report	Report Daily Max	XXX	XXX	XXX	XXX	Continuous	Metered
pH (S.U.)	XXX	XXX	6.0	XXX	XXX	9.0	1/day	Grab
Dissolved Oxygen	XXX	XXX	Report	XXX	XXX	XXX	1/day	Grab
Total Residual Chlorine	XXX	XXX	XXX	0.27	XXX	0.88	1/day	Grab
CBOD5 Jun 1 - Oct 31	21	31	XXX	10	15	20	1/week	8-Hr Composite
CBOD5 Nov 1 - May 31	41	62	XXX	20	30	40	1/week	8-Hr Composite
BOD5 Raw Sewage Influent	Report	Report Daily Max	XXX	Report	XXX	XXX	1/week	8-Hr Composite
Total Suspended Solids	62	93	XXX	30	45	60	1/week	8-Hr Composite
Total Suspended Solids Raw Sewage Influent	Report	Report Daily Max	XXX	Report	XXX	XXX	1/week	8-Hr Composite
Fecal Coliform (CFU/100 ml) May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	XXX	1,000	1/week	Grab
Fecal Coliform (CFU/100 ml) Oct 1 - Apr 30	XXX	XXX	XXX	2,000 Geo Mean	XXX	10,000	1/week	Grab
Ammonia-Nitrogen Jun 1 - Oct 31	6.0	9.0	XXX	3.0	4.5	6.0	2/week	8-Hr Composite
Ammonia-Nitrogen Nov 1 - May 31	19	27	XXX	9.0	13.5	18	2/week	8-Hr Composite
Total Phosphorus	4.1	6.2	XXX	2.0	3.0	4.0	2/week	8-Hr Composite

Existing Effluent Limitations and Monitoring Requirements, Cont'd - Chesapeake Bay								
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		Report			2/week	8-Hr Composite
Kjeldahl---N	Report			Report			2/week	8-Hr Composite
Nitrate-Nitrite as N	Report			Report			2/week	8-Hr Composite
Total Nitrogen	Report	Report		Report			1/month	Calculation
Total Phosphorus	Report	Report		Report			2/week	8-Hr Composite
Net Total Nitrogen	Report	8,402					1/month	Calculation
Net Total Phosphorus	Report	1,120					1/month	Calculation

Development of Effluent Limitations

Outfall No. 001 **Design Flow (MGD)** 0.46
Latitude 41º 55' 28.90" **Longitude** -77º 31' 17.75"
Wastewater Description: Sewage Effluent

Technology-Based Limitations

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

Pollutant	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)
	30	Average Monthly	133.102(b)(1)	92a.47(a)(1)
Total Suspended Solids	45	Average Weekly	133.102(b)(2)	92a.47(a)(2)
pH	6.0 – 9.0 S.U.	Min – Max	133.102(c)	95.2(1)
Fecal Coliform (5/1 – 9/30)	200 / 100 ml	Geo Mean	-	92a.47(a)(4)
Fecal Coliform (5/1 – 9/30)	1,000 / 100 ml	IMAX	-	92a.47(a)(4)
Fecal Coliform (10/1 – 4/30)	2,000 / 100 ml	Geo Mean	-	92a.47(a)(5)
Fecal Coliform (10/1 – 4/30)	10,000 / 100 ml	IMAX	-	92a.47(a)(5)
Total Residual Chlorine	0.5	Average Monthly	-	92a.48(b)(2)

Comments: The above limits are applicable and already included in the existing permit except for a more stringent water quality-based limitation for TRC.

Water Quality-Based Limitations

DO, CBOD5 and NH3-N

The facility has existing water quality-based limitations for $CBOD_5$ and Ammonia-nitrogen. The Department uses the WQM7.0 model to evaluate point source discharges of dissolved oxygen (DO), carbonaceous BOD ($CBOD_5$), and ammonia-nitrogen (NH_3-N) into free-flowing streams and rivers. To accomplish this, the model simulates two basic processes: the mixing and degradation of NH_3-N in the stream and the mixing and consumption of DO in the stream due to the degradation of $CBOD_5$ and NH_3-N. WQM7.0 modeling of the discharge to the Cowanesque River was performed for the previous review (see Attachment B) and showed that the existing limitations are adequate. The existing DO monitoring will continue.

Total Residual Chlorine

The Department uses a modeling spreadsheet to determine appropriate limitations for TRC based on available instream criteria and other factors. The attached modeling from the previous review shows that the existing water quality-based limit is adequate to protect the receiving stream.

Water Quality Toxics Management

No additional Reasonable Potential Analysis was performed for this minor POTW with no significant industrial users to determine additional toxic parameters as candidates for limitations or monitoring.

Best Professional Judgment (BPJ) Limitations

Comments: None needed besides the above technology and water quality-based limits.

Chesapeake Bay/Nutrient Requirements

A portion of the Chesapeake Bay and many of its tidal tributaries have been listed as impaired under Section 303(d) of the Water Pollution Control Act, 33 U.S.C. §1313(d). Total Nitrogen and Total Phosphorus cap loads have been established for significant dischargers in Pennsylvania in order to reduce the total nutrient load to the Bay and meet State of Maryland Water Quality Standards. As a 0.46 MGD facility, the Westfield Borough treatment facility is considered a Phase 3,

Significant Chesapeake Bay discharger. Nutrient cap loadings have previously been established for this facility pursuant to the Phase III Watershed Implementation Plan.

The discharge's cap loadings as well as the actual Total Nitrogen and Total Phosphorus loadings for the past two cycle years are listed in the table below.

Nutrient	Total Nitrogen	Total Phosphorus
Nutrient Cap Loads for PA0114821	8,402	1,120
10/1/18 – 9/30/19 Loadings	<7,775	899
10/1/17 – 9/30/18 Loadings	6,958	730

As a discharger to the Cowanesque River, the facility also has an existing Phosphorus limit of 2.0 mg/l to improve the eutrophic conditions in the Cowanesque Reservoir.

Anti-Backsliding

No proposed limitations were made less stringent consistent with the anti-degradation requirements of the Clean Water Act and 40 CFR 122.44(l).

Proposed Effluent Limitations and Monitoring Requirements

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

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

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly	Weekly Average	Minimum	Average Monthly	Weekly Average	Instant. Maximum		
Flow (MGD)	Report	Report Daily Max	XXX	XXX	XXX	XXX	Continuous	Metered
pH (S.U.)	XXX	XXX	6.0 Inst Min	XXX	XXX	9.0	1/day	Grab
Dissolved Oxygen	XXX	XXX	Report Inst Min	XXX	XXX	XXX	1/day	Grab
Total Residual Chlorine (TRC)	XXX	XXX	XXX	0.27	XXX	0.88	1/day	Grab
Carbonaceous Biochemical Oxygen Demand (CBOD5) Nov 1 - May 31	41	62	XXX	20	30	40	1/week	8-Hr Composite
Carbonaceous Biochemical Oxygen Demand (CBOD5) Jun 1 - Oct 31	21	31	XXX	10	15	20	1/week	8-Hr Composite
Biochemical Oxygen Demand (BOD5) Raw Sewage Influent	Report	Report Daily Max	XXX	Report	XXX	XXX	1/week	8-Hr Composite
Total Suspended Solids Raw Sewage Influent	Report	Report Daily Max	XXX	Report	XXX	XXX	1/week	8-Hr Composite
Total Suspended Solids	62	93	XXX	30	45	60	1/week	8-Hr Composite
Fecal Coliform (No./100 ml) Oct 1 - Apr 30	XXX	XXX	XXX	2000 Geo Mean	XXX	10000	1/week	Grab
Fecal Coliform (No./100 ml) May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	XXX	1000	1/week	Grab
Ammonia-Nitrogen Nov 1 - May 31	19	27	XXX	9.0	13.5	18	2/week	8-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	Minimum	Average Monthly	Weekly Average	Instant. Maximum		
Ammonia-Nitrogen Jun 1 - Oct 31	6.0	9.0	XXX	3.0	4.5	6	2/week	8-Hr Composite
Total Phosphorus	4.1	6.2	XXX	2.0	3.0	4	2/week	8-Hr Composite

Compliance Sampling Location: Outfall 001

Other Comments: The above limitations and monitoring are unchanged from the existing permit.

Proposed Effluent Limitations and Monitoring Requirements

The limitations and monitoring requirements specified below are proposed for the draft permit, to comply with Pennsylvania's Chesapeake Bay Tributary Strategy.

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

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Monthly	Annual	Monthly	Monthly Average	Maximum	Instant. Maximum		
Ammonia--N	Report	Report	XXX	Report	XXX	XXX	2/week	8-Hr Composite
Kjeldahl--N	Report	XXX	XXX	Report	XXX	XXX	2/week	8-Hr Composite
Nitrate-Nitrite as N	Report	XXX	XXX	Report	XXX	XXX	2/week	8-Hr Composite
Total Nitrogen	Report	Report	XXX	Report	XXX	XXX	1/month	Calculation
Total Phosphorus	Report	Report	XXX	Report	XXX	XXX	2/week	8-Hr Composite
Net Total Nitrogen	XXX	8402	XXX	XXX	XXX	XXX	1/year	Calculation
Net Total Phosphorus	XXX	1120	XXX	XXX	XXX	XXX	1/year	Calculation

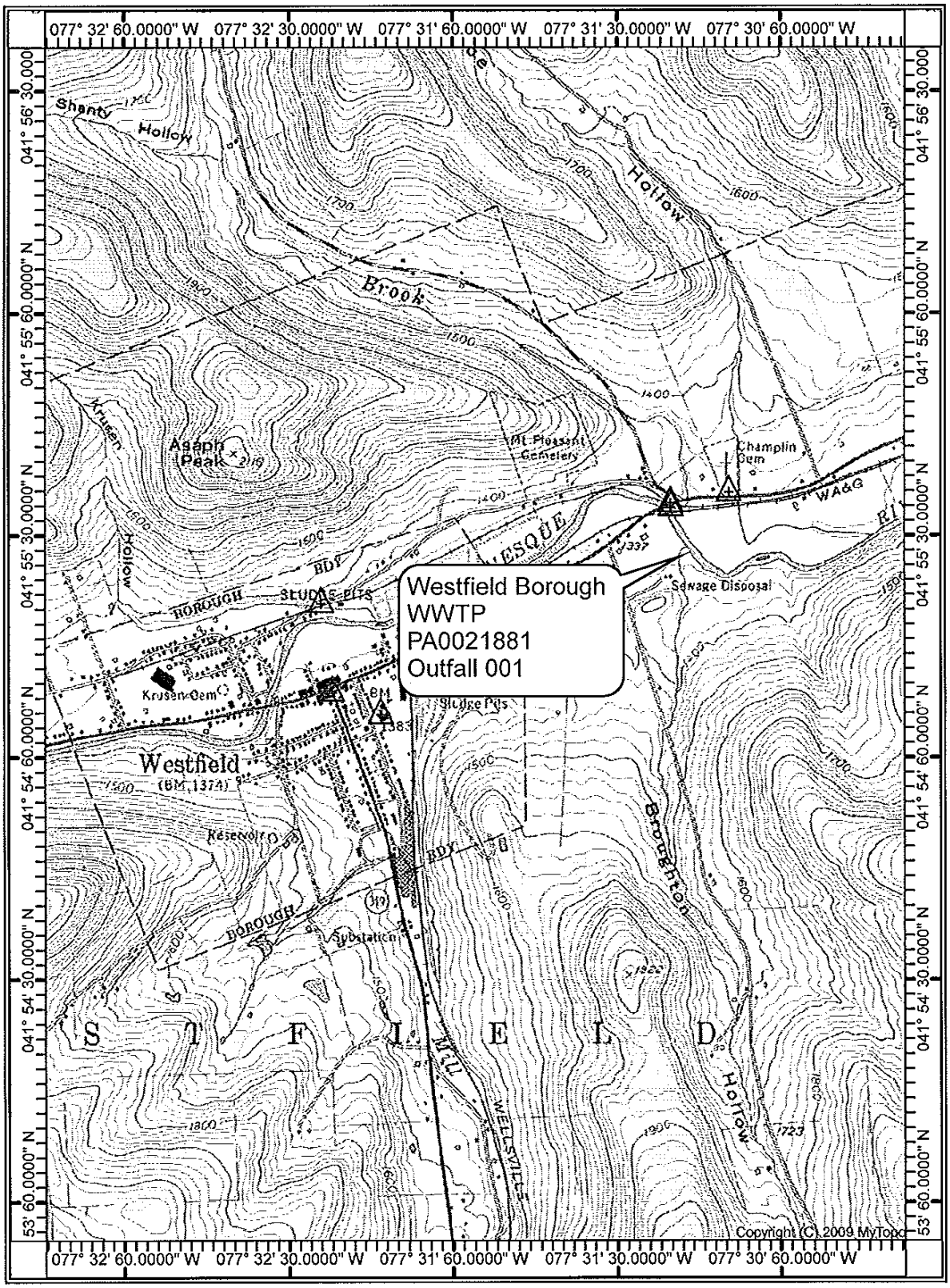
Compliance Sampling Location: Outfall 001

Monthly Net Total Nitrogen and Phosphorus monitoring have been removed consistent with the Phase III WIP.

Tools and References Used to Develop Permit	
☒	WQM for Windows Model (see Attachment **B**)
☐	PENTOXSD for Windows Model (see Attachment)
☒	TRC Model Spreadsheet (see Attachment **C**)
☐	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: Establishing Effluent Limitations for Individual Sewage Permits, rev. 8/23/13
☐	Other:

Attachments:

A. Discharge Location Map
B. WQM7.0 Modeling
C. TRC Model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Shanty Hollow
Brook
Asaph Peak
Mt Pleasant Cemetery
Champlin Gem
WA&G
Sewage Disposal
Westfield Borough
WWTP
PA0021881
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Sludge Pits
Westfield
(BM 1374)
Reservoir
Substation
Brockton
Hollow
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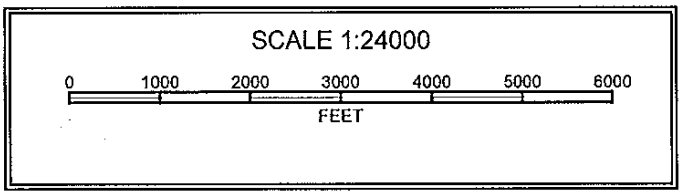
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Input Data WQM 7.0

SWP Basin	Stream Code	Stream Name	RMI	Elevation (ft)	Drainage Area (sq mi)	Slope (ft/ft)	PWS Withdrawal (mgd)	Apply FC
04A	30995	COWANESQUE RIVER	27.600	1311.00	96.80	0.00000	0.00	☑

Stream Data

Design Cond.	LFY (cfsm)	Trib Flow (cfs)	Stream Flow (cfs)	Rch Trav Time (days)	Rch Velocity (fps)	WD Ratio	Rch Width (ft)	Rch Depth (ft)	Tributary Temp (°C)	Tributary pH	Stream Temp (°C)	Stream pH
Q7-10	0.013	0.00	0.00	0.000	0.000	0.0	0.00	0.00	20.00	7.00	0.00	0.00
Q1-10		0.00	0.00	0.000	0.000							
Q30-10		0.00	0.00	0.000	0.000							

Discharge Data

Name	Permit Number	Existing Disc Flow (mgd)	Permitted Disc Flow (mgd)	Design Disc Flow (mgd)	Reserve Factor	Disc Temp (°C)	Disc pH
Westfield Boro	PA0021881	0.4600	0.0000	0.0000	0.000	25.00	7.00

Parameter Data

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

Input Data WQM 7.0

SWP Basin	Stream Code	Stream Name	RMI	Elevation (ft)	Drainage Area (sq mi)	Slope (ft/ft)	PWS Withdrawal (mgd)	Apply FC
04A	30995	COWANESQUE RIVER	**26.400**	1300.00	100.00	0.00000	0.00	☑

Stream Data

Design Cond.	LFY (cfsm)	Trib Flow (cfs)	Stream Flow (cfs)	Rch Trav Time (days)	Rch Velocity (fps)	WD Ratio	Rch Width (ft)	Rch Depth (ft)	Tributary Temp (°C)	Tributary pH	Stream Temp (°C)	Stream pH
Q7-10	0.013	0.00	0.00	0.000	0.000	0.0	0.00	0.00	20.00	7.00	0.00	0.00
Q1-10		0.00	0.00	0.000	0.000							
Q30-10		0.00	0.00	0.000	0.000							

Discharge Data

Name	Permit Number	Existing Disc Flow (mgd)	Permitted Disc Flow (mgd)	Design Disc Flow (mgd)	Reserve Factor	Disc Temp (°C)	Disc pH
		0.0000	0.0000	0.0000	0.000	25.00	7.00

Parameter Data

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

WQM 7.0 Hydrodynamic Outputs

SWP Basin	Stream Code	Stream Name
04A	30995	COWANESQUE RIVER

RMI	Stream Flow (cfs)	PWS With (cfs)	Net Stream Flow (cfs)	Disc Analysis Flow (cfs)	Reach Slope (ft/ft)	Depth (ft)	Width (ft)	W/D Ratio	Velocity (fps)	Reach Trav Time (days)	Analysis Temp (°C)	Analysis pH
Q7-10 Flow												
27.600	1.28	0.00	1.28	.7116	0.00174	.654	29.45	45.05	0.10	0.708	21.78	7.00
Q1-10 Flow												
27.600	0.82	0.00	0.82	.7116	0.00174	NA	NA	NA	0.09	0.821	22.32	7.00
Q30-10 Flow												
27.600	1.74	0.00	1.74	.7116	0.00174	NA	NA	NA	0.12	0.630	21.45	7.00

WQM 7.0 Modeling Specifications

Parameters	Both	Use Inputted Q1-10 and Q30-10 Flows	☑
WLA Method	EMPR	Use Inputted W/D Ratio	☐
Q1-10/Q7-10 Ratio	0.64	Use Inputted Reach Travel Times	☐
Q30-10/Q7-10 Ratio	1.36	Temperature Adjust Kr	☑
D.O. Saturation	90.00%	Use Balanced Technology	☑
D.O. Goal	5		

WQM 7.0 Wasteload Allocations

SWP Basin	Stream Code	Stream Name
04A	30995	COWANESQUE RIVER

NH3-N Acute Allocations

RMI	Discharge Name	Baseline Criterion (mg/L)	Baseline WLA (mg/L)	Multiple Criterion (mg/L)	Multiple WLA (mg/L)	Critical Reach	Percent Reduction
27.600	Westfield Boro	8.18	17.62	8.18	17.62	0	0

NH3-N Chronic Allocations

RMI	Discharge Name	Baseline Criterion (mg/L)	Baseline WLA (mg/L)	Multiple Criterion (mg/L)	Multiple WLA (mg/L)	Critical Reach	Percent Reduction
27.600	Westfield Boro	1.73	5.96	1.73	5.96	0	0

Dissolved Oxygen Allocations

RMI	Discharge Name	CBOD5		NH3-N		Dissolved Oxygen		Critical Reach	Percent Reduction
		Baseline (mg/L)	Multiple (mg/L)	Baseline (mg/L)	Multiple (mg/L)	Baseline (mg/L)	Multiple (mg/L)		
27.60	Westfield Boro	12.82	12.82	3.85	3.85	3	3	0	0

WQM 7.0 D.O.Simulation

SWP Basin	Stream Code	Stream Name
04A	30995	COWANESQUE RIVER

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
27.600	0.460	21.784	7.000
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
29.450	0.654	45.048	0.104
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
5.86	0.557	1.37	0.803
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
6.372	1.783	Tsivoglou	5
Reach Travel Time (days)			
0.708			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.071	5.62	1.30	6.00
0.142	5.38	1.23	5.70
0.212	5.16	1.16	5.46
0.283	4.94	1.09	5.29
0.354	4.73	1.03	5.16
0.425	4.53	0.98	5.07
0.496	4.34	0.92	5.02
0.566	4.16	0.87	5.00
0.637	3.99	0.82	5.01
0.708	3.82	0.78	5.04

WQM 7.0 Effluent Limits

SWP Basin	Stream Code	Stream Name
04A	30995	COWANESQUE RIVER

RMI	Name	Permit Number	Disc Flow (mgd)	Parameter	Effl. Limit 30-day Ave. (mg/L)	Effl. Limit Maximum (mg/L)	Effl. Limit Minimum (mg/L)
27.600	Westfield Boro	PA0021881	0.460	CBOD5	12.82		
				NH3-N	3.85	7.7	
				Dissolved Oxygen			3

TRC EVALUATION					
Client			Date		
1.28	**= Q stream (cfs)**		**0.5**	**= CV Daily**	
0.46	**= Q discharge (MGD)**		**0.5**	**= CV Hourly**	
30	**= no. samples**		**1**	**= AFC_Partial Mix Factor**	
0.3	**= Chlorine Demand of Stream**		**1**	**= CFC_Partial Mix Factor**	
0	**= Chlorine Demand of Discharge**		**15**	**= AFC_Criteria Compliance Time (min)**	
0.5	**= BAT/BPJ Value**		**720**	**= CFC_Criteria Compliance Time (min)**	
	= % Factor of Safety (FOS)		**0**	**=Decay Coefficient (K)**	

Source	Reference	AFC Calculations		Reference	CFC Calculations	
TRC	**1.3.2.iii**	WLA afc =	0.593	**1.3.2.iii**	WLA cfc =	0.570
PENTOXSD TRG	**5.1a**	LTAMULT afc =	0.373	**5.1c**	LTAMULT cfc =	0.581
PENTOXSD TRG	**5.1b**	LTA_afc=	0.221	**5.1d**	LTA_cfc =	0.332
		WQBEL_afc=	**0.272**		WQBEL_cfc=	0.408

Source		Effluent Limit Calculations		
PENTOXSD TRG	5.1f	AML MULT =	1.231	
PENTOXSD TRG	5.1g	AVG MON LIMIT (mg/l) =	0.272	AFC
		INST MAX LIMIT (mg/l) =	0.889	

WLA afc	**(.019/e(-k*AFC_tc)) + [(AFC_Yc*Qs*.019/Qd*e(-k*AFC_tc))...** **...+ Xd + (AFC_Yc*Qs*Xs/Qd)]*(1-FOS/100)**
LTAMULT afc	EXP((0.5*LN(cvh^2+1))-2.326*LN(cvh^2+1)^0.5)
LTA_afc	wla_afc*LTAMULT_afc
WLA_cfc	**(.011/e(-k*CFC_tc) + [(CFC_Yc*Qs*.011/Qd*e(-k*CFC_tc))...** **...+ Xd + (CFC_Yc*Qs*Xs/Qd)]*(1-FOS/100)**
LTAMULT_cfc	EXP((0.5*LN(cvd^2/no_samples+1))-2.326*LN(cvd^2/no_samples+1)^0.5)
LTA_cfc	wla_cfc*LTAMULT_cfc
AML MULT	EXP(2.326*LN((cvd^2/no_samples+1)^0.5)-0.5*LN(cvd^2/no_samples+1))
AVG MON LIMIT	MIN(BAT_BPJ,MIN(LTA_afc,LTA_cfc)*AML_MULT)
INST MAX LIMIT	**1.5*((av_mon_limit/AML_MULT)/LTAMULT_afc)**

TRC Evalutation