pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Southwest Regional Office
CLEAN WATER PROGRAM

Application Type	**Renewal**	Application No.	**PA0093165**
Facility Type	**Non-Municipal**	APS ID	**1068144**
Major / Minor	**Minor**	Authorization ID	**1404374**

NPDES PERMIT FACT SHEET
INDIVIDUAL SEWAGE

Applicant and Facility Information

Applicant Name	**PA American Water Co.**	Facility Name	**PA American Water - Claysville STP**
Applicant Address	852 Wesley Drive	Facility Address	891 Old National Pike
	Mechanicsburg, PA 17055		Claysville, PA 15323-1265
Applicant Contact	Jim Runzer	Facility Contact	Michael Tedesco
Applicant Phone	(717) 550-1540	Facility Phone	(412)-418-6590
Client ID	87712	Site ID	246470
Ch 94 Load Status	Not Overloaded	Municipality	Donegal Township
Connection Status	No Limitations	County	Washington
Date Application Received	July 26, 2022	EPA Waived?	Yes
Date Application Accepted		If No, Reason	

Purpose of Application: Application for renewal of an NPDES Permit for treated sewage

Summary of Review

The permittee has applied for a renewal of NPDES Permit No. PA0093165. NPDES Permit No. PA0093165 was previously issued by the Pennsylvania Department of Environmental Protection (DEP) on March 7, 2022. That permit expired March 31, 2023 and was granted an administrative extension.

Sewage from this facility is treated with rotating biological contactors, Del Pac addition for phosphorus removal, sodium bicarbonate addition for pH and alkalinity control, gas chlorination, and sodium bisulfate dechlorination before discharging to Dutch Fork (32838), which is classified as a High-Quality Warm Water Fishery (HQ-WWF) per Chapter 93 Designated Use and is located in State Watershed 20-E.

The applicant is currently enrolled in and will continue to use eDMR.

Sewage sludge is pumped and disposed of by both Shipman's Sanitary Service, Inc. and Liquid Assets Disposal, Inc.

Compliance with Act 14 is documented with letters dated March 22, 2022 and sent to Donegal Township and Washington County.

Changes since the last permit include:

- Addition of *E. coli* monitoring in accordance with 25 Pa. Code § 93.7(a).
- Reduction of the $CBOD_5$ mass loading and concentration limits to reflect Antidegradation Best Available Combination of Technologies (ABACT).
- Reduction of the average monthly summer and winter ammonia-nitrogen, total phosphorus, and TSS mass loading limits to reflect the department rounding policy.

Approve	Deny	Signatures	Date
X		Stephanie Conrad / Environmental Engineering Specialist	September 26, 2023
x		Mahbuba Iasmin, Ph.D., P.E. / Environmental Engineering Manager	January 9, 2024

Summary of Review

- Reduction of the TSS mass loading and concentration limits to reflect Antidegradation ABACT.
- Reduction of the weekly average concentration limit for summer ammonia-nitrogen to reflect the department rounding policy
- Reduction of the total residual chlorine average monthly and instantaneous maximum limits to reflect Antidegradation Best Available Combination of Technologies (ABACT).

Anti-Backsliding

Section 402(o) of the Clean Water Act (CWA), enacted in the Water Quality Act of 1987, establishes anti-backsliding rules governing two situations. The first situation occurs when a permittee seeks to revise a Technology-Based effluent limitation based on BPJ to reflect a subsequently promulgated effluent guideline which is less stringent. The second situation addressed by Section 402(o) arises when a permittee seeks relaxation of an effluent limitation which is based upon a State treatment standard of water quality standard.

Previous limits can be used pursuant to EPA's anti-backsliding regulation 40 CFR 122.44 *(l) Reissued permits. (1) Except as provided in paragraph (l)(2) of this section when a permit is renewed or reissued. Interim effluent limitations, standards or conditions must be at least as stringent as the final effluent limitations, standards, or conditions in the previous permit (unless the circumstances on which the previous permit was based have materially and substantially changed since the time the permit was issued and would constitute cause for permit modification or revocation and reissuance under §122.62). (2) In the case of effluent limitations established on the basis of Section 402(a)(1)(B) of the CWA, a permit may not be renewed, reissued, or modified on the basis of effluent guidelines promulgated under section 304(b) subsequent to the original issuance of such permit, to contain effluent limitations which are less stringent than the comparable effluent limitations in the previous permit.*

The Dissolved Oxygen instantaneous minimum concentration limit is being reduced in accordance with 40 CFR 122.44 (l)1.2.i.B.2. Further information is provided in the Dissolved Oxygen Limitations section below.

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.

Draft Permit issuance is recommended. Justifications on the development of effluent limitations are added below.

Discharge, Receiving Waters and Water Supply Information

Outfall No.	001	Design Flow (MGD)	0.16
Latitude	40º 6' 53"	Longitude	-80º 25' 54"
Quad Name	Claysville	Quad Code	1802
Wastewater Description:	Sewage Effluent		

Receiving Waters	Dutch Fork (HQ-WWF)	Stream Code	32838
NHD Com ID	73866732	RMI	9.18
Drainage Area	3.95	Yield (cfs/mi^2)	0.01157
Q_{7-10} Flow (cfs)	0.0457	Q_{7-10} Basis	USGS Stream Stats
Elevation (ft)	1060	Slope (ft/ft)	
Watershed No.	20-E	Chapter 93 Class.	HQ-WWF
Existing Use		Existing Use Qualifier	
Exceptions to Use		Exceptions to Criteria	
Assessment Status	Attaining Use(s)		
Cause(s) of Impairment			
Source(s) of Impairment			
TMDL Status		Name	

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

Nearest Downstream Public Water Supply Intake	None Located within Pennsylvania		
PWS Waters	N/A	Flow at Intake (cfs)	N/A
PWS RMI	N/A	Distance from Outfall (mi)	>11.77

Changes Since Last Permit Issuance: None

Treatment Facility Summary

Treatment Facility Name: PA American Water - Claysville Water Pollution Control Plant

WQM Permit No.	Issuance Date	Purpose
6381412	January 6, 1983	Permit issued to Claysville-Donegal Joint Municipal Authority by the Department of Environmental Resources approving installation of: • 58,000 LF of 8" and 10" gravity sewers and appurtenances • 1,750 LF 2" Sch 80 PVC force main • 340-gallon pump station with 2- 25 gpm grinder pumps • 1250-gallon pump station with 2-290 gpm centrifugal pumps • 85 LF Sch 80 PVC force main • One (1) 1" bypass manual bar screen • One (1) comminutor • One (1) 24,000-gallon equalization tank • Two (2) 6,000-gallon primary sedimentation tank • Two (2) 18,000-gallon final sedimentation tanks • Two (2) 2,514 chlorine contact tanks with gas chlorination • Two (2) sludge digester tanks • One (1) flocculation tank • Two (2) 3.6' by 3' rotating biological contactors
6381412	January 29, 1992	Permit issued to Claysville-Donegal Joint Municipal Authority by the Department of Environmental Resources approving the installation of mechanical sludge dewatering including: • One (1) variable speed screw press • One (1) polymer feed pump • One (1) head tank feed flocculator • Two (2) polymer feed tanks • One (1) polymer mix tank • Two (2) polymer tank mixers • One (1) control panel • One (1) variable speed pump
6394405	September 12, 1994	
6381412 T-1	July 31, 2008	Permit issued to Pennsylvania American Water Company by DEP approving the transfer of ownership from Claysville-Donegal Joint Municipal Authority.
6394405 T-1	July 31, 2008	Permit issued to Pennsylvania American Water Company by DEP approving the transfer of ownership from Claysville-Donegal Joint Municipal Authority.
6381412 A-2	August 13, 2014	Permit issued by to Pennsylvania American Water Company by DEP approving the installation of a 400,000-gallon wet weather tank and upgrade of raw sewage pumps to ones having a capacity of 625 gpm.

Waste Type	Degree of Treatment	Process Type	Disinfection	Avg Annual Flow (MGD)
Sewage	Secondary	Rotating Biological Contactors	Gas Chlorine	0.16

Hydraulic Capacity (MGD)	Organic Capacity (lbs/day)	Load Status	Biosolids Treatment	Biosolids Use/Disposal
0.16	350	Not Overloaded		

Changes Since Last Permit Issuance:

Other Comments:

Compliance History

Operations Compliance Check Summary Report

Facility: PA American Water Claysville STP

NPDES Permit No.: PA0093165

Compliance Review Period: 8/15/18-8/15/23

Inspection Summary:

INSPECTED DATE	INSP TYPE	AGENCY	INSPECTION RESULT DESC
03/17/2022	Compliance Evaluation	PA Dept of Environmental Protection	Violation(s) Noted
12/19/2018	Compliance Evaluation	PA Dept of Environmental Protection	Violation(s) Noted

Violation Summary:

VIOLATION DATE	VIOLATION TYPE	VIOLATION TYPE DESC
03/17/2022	92A.44	NPDES - Violation of effluent limits in Part A of permit
12/19/2018	92A.41(A)13B	NPDES - Unauthorized bypass occurred
12/19/2018	92A.44	NPDES - Violation of effluent limits in Part A of permit
12/19/2018	92A.41(A)10B	NPDES - Failure to utilize approved analytical methods

Open Violations by Client ID:

There are no open violations with Clean Water Program for Client ID 87712. The following open violations exist at two facilities overseen by Safe Drinking Water Program North Central and Southeast Regions:

FACILITY	PROGRAM SPECIFIC ID	INSP ID	VIOLATION ID	INSPECTION CATEGORY	VIOLATION DATE	VIOLATION CODE	VIOLATION
PA AMERICAN COATESVILLE	1150106	3541030	991971	PF	04/20/2023	C4A	FAILURE TO OPERATE AND MAINTAIN THE WATER SYSTEM
PA AMERICAN WHITE DEER	4490023	3481908	980581	PF	12/09/2022	C3B	FAILURE OF A PUBLIC WATER SYSTEM TO PROVIDE THE LEVEL OF TREATMENT APPROVED IN ITS PERMIT
PA AMERICAN WHITE DEER	4490023	3481908	980582	PF	12/09/2022	C3B	FAILURE OF A PUBLIC WATER SYSTEM TO PROVIDE THE LEVEL OF TREATMENT APPROVED IN ITS PERMIT

Enforcement Summary:

ENF TYPE	EXECUTED DATE	VIOLATIONS	ENF FINAL STATUS	ENF CLOSED DATE
NOV	03/30/2022	92A.44	Comply/Closed	07/28/2022
NOV	03/13/2019	92A.41(A)10B; 92A.41(A)13B; 92A.44	Administrative Close Out	12/09/2019

Effluent Violation Summary:

MON_PD_END	OUTFALL	PARAMETER	SAMPLE	PERMIT	UNIT	STAT_BASE_CODE
Jul-21	1	Dissolved Oxygen	6.7	7	mg/L	Minimum
May-20	1	Ammonia-Nitrogen	1.525	1.5	mg/L	Average Monthly
May-20	1	Ammonia-Nitrogen	2.597	2.3	mg/L	Weekly Average

Compliance Status: Facility is currently in compliance with Clean Water Program no open violations enforcements pending.

Completed by: Amanda Schmidt

Completed date: 8/21/23

Compliance History

DMR Data for Outfall 001 (from July 1, 2022 to June 30, 2023)

Parameter	JUN-23	MAY-23	APR-23	MAR-23	FEB-23	JAN-23	DEC-22	NOV-22	OCT-22	SEP-22	AUG-22	JUL-22
Flow (MGD) Average Monthly	0.06808	0.07295	0.07405	0.10094	0.08508	0.11785	0.07639	0.07735	0.07482	0.06491	0.05848	0.05912
Flow (MGD) Daily Maximum	0.12631	0.12925	0.11063	0.32798	0.17567	0.26376	0.14263	0.22938	0.30629	0.10913	0.15696	0.13142
pH (S.U.) Minimum	6.1	6.4	6.6	6.6	6.5	6.8	6.5	6.7	6.4	6.5	6.3	6.5
pH (S.U.) Maximum	7.4	7.3	7.4	7.4	7.3	7.5	7.2	7.4	7.5	7.6	7.2	7.4
DO (mg/L) Minimum	7.3	8.4	8.8	9.9	9.8	9.7	9.2	8.4	8.3	7.1	7.1	7.0
TRC (mg/L) Average Monthly	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
TRC (mg/L) Instantaneous Maximum	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
$CBOD_5$ (lbs/day) Average Monthly	3.0	3.9	4.4	4.1	4.1	6.1	4.5	4.0	4.4	2.6	3.7	3.5
$CBOD_5$ (lbs/day) Weekly Average	3.9	5.0	5.6	8.8	5.2	10.5	5.8	4.6	5.9	3.2	6.9	4.5
$CBOD_5$ (mg/L) Average Monthly	5.9	6.4	7.6	6.7	6.8	6.3	7.9	7.0	8.5	5.0	7.4	8.1
$CBOD_5$ (mg/L) Weekly Average	8.0	8.3	8.3	8.5	8.0	7.5	9.0	8.0	11.3	6.0	9.5	10.3
BOD_5 (lbs/day) Raw Sewage Influent Average Monthly	106	121	92.0	131	116	124.0	116.0	120.0	85.0	92.0	82.0	86
BOD_5 (lbs/day) Raw Sewage Influent Daily Maximum	117	173	152.0	144	131	159.0	133.0	134.0	105.0	119.0	134.0	104
BOD_5 (mg/L) Raw Sewage Influent Average Monthly	205.9	200.7	155.0	210.9	198	146.4	203.5	207.3	166.0	173.6	172.2	196
TSS (lbs/day) Average Monthly	4.7	8.6	8.3	6.4	7.8	18.8	8.5	8.5	6.6	5.5	5.1	4.8

TSS (lbs/day) Raw Sewage Influent Average Monthly	169	174	170.0	143	91	180.0	190.0	174.0	131.0	161.0	136.0	132
TSS (lbs/day) Raw Sewage Influent Daily Maximum	240	229	353.0	182	160	280.0	201.0	219.0	167.0	185.0	228.0	162
TSS (lbs/day) Weekly Average	5.4	11.0	9.5	16.1	8.5	30.7	9.3	11.0	7.6	6.5	6.5	6.3
TSS (mg/L) Average Monthly	9.3	14.4	14.8	10.3	13.7	18.5	15.0	14.8	12.5	10.5	10.6	10.8
TSS (mg/L) Raw Sewage Influent Average Monthly	333	292	276.0	228	153	189.0	335.0	302.0	257.0	305.0	278.0	303
TSS (mg/L) Weekly Average	11.0	16.0	19.0	12.0	17.0	28.0	17.0	18.0	14.0	12.0	12.0	12.0
Fecal Coliform (No./100 ml) Geometric Mean	< 2	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 2.0	< 2.0	< 1.0	< 3.0	< 1.0
Fecal Coliform (No./100 ml) Instantaneous Maximum	5.2	7.5	2.0	< 1.0	2.0	1.0	1.0	7.3	7.4	2.0	12.1	3.1
Total Nitrogen (mg/L) Daily Maximum							31.1					
Ammonia-Nitrogen (lbs/day) Average Monthly	0.3	0.3	0.3	0.4	0.4	0.6	0.4	0.3	0.1	0.1	0.1	0.1
Ammonia-Nitrogen (lbs/day) Weekly Average	0.6	0.6	0.5	0.9	0.5	1.8	0.7	0.8	0.1	0.3	0.1	0.3
Ammonia-Nitrogen (mg/L) Average Monthly	0.7	0.5	0.5	0.6	0.7	0.4	0.6	0.6	0.1	0.3	0.2	0.2
Ammonia-Nitrogen (mg/L) Weekly Average	1.1	1.1	0.9	0.8	1.0	1.0	1.1	1.6	0.2	0.5	0.2	0.6
Total Phosphorus (lbs/day) Average Monthly	0.5	0.7	0.8	0.4	0.5	0.8	0.7	0.7	0.6	0.6	0.5	0.5
Total Phosphorus (lbs/day) Weekly Average	0.6	0.9	1.2	1.1	0.6	1.6	0.9	0.9	0.8	0.8	0.8	0.7

Total Phosphorus (mg/L) Average Monthly	1.0	1.1	1.4	0.7	0.9	0.7	1.2	1.2	1.2	1.1	1.1	1.0
Total Phosphorus (mg/L) Weekly Average	1.1	1.6	1.8	0.9	1.2	0.9	1.6	1.7	1.5	1.4	1.2	1.4

Development of Effluent Limitations

Outfall No.	001	**Design Flow (MGD)**	0.16
Latitude	40º 7' 6.00"	**Longitude**	-80º 25' 56.00"
Wastewater Description:	Sewage Effluent		

Technology-Based Limitations (TBELs)

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

Pollutant	Limit (mg/l)	SBC	Federal Regulation	State Regulation
Flow (MGD)	Report	Average Monthly	-	92a.27, 92a.61
$CBOD_5$	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)
Total Residual Chlorine	0.5	Average Monthly	-	92a.48(b)(2)
Ammonia-Nitrogen	25	Average Monthly	-	BPJ
Dissolved Oxygen	4.0	Min	-	BPJ
pH	6.0 – 9.0 S.U.	Min – Max	133.102(c)	95.2(1)
Total Nitrogen	Report	Average Monthly	-	92a.61
Total Phosphorus	Report	Average Monthly	-	92a.61
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)

Water Quality-Based Limitations (WQBELs)

Pursuant to EPA's approval of Pennsylvania's 2017 Triennial Review of Water Quality Standards and corresponding regulatory changes published in the *Pennsylvania Bulletin* on July 11, 2020, new water quality criteria for ammonia-nitrogen apply to waters of the commonwealth. Therefore, WQBELs for Outfall 001 are being re-evaluated even though there have been no changes to the treatment plant.

WQM 7.0 Water Quality Modeling

DEP's WQM 7.0 version 1.1 model is a Microsoft Access Program used for sewage dischargers to determine whether TBELs are sufficient to meet in-stream water quality criteria for ammonia-nitrogen, carbonaceous biochemical oxygen demand ($CBOD_5$), and dissolved oxygen (DO). To accomplish this, the model simultaneously simulates mixing and degradation of ammonia-nitrogen and mixing and consumption of DO through $CBOD_5$ and ammonia-nitrogen degradation. WQM 7.0 determines the highest pollutant loadings that the stream can assimilate while still meeting water quality criteria under design conditions.

The model is a two-step process. The discharge is first modeled for the summer period (May through October) because warm temperatures are more likely to result in critical loading conditions. Reduced DO levels likely also play a role in ammonia toxicity and solubility of DO decreases at increased water temperature. If summer modeling determines that WQBELs are appropriate for the summer period, then modeling is completed for the winter period (November through April). This is in accordance with DEP's *Implementation Guidance of Section 93.7 Ammonia Criteria* [Do. No. 391-2000-013] (Ammonia Guidance).

River Mile Index (RMI) was measured in eMAP PA as the distance from the facility's outfall to the mouth of the Dutch Fork. Elevation was read by applying a topomap in eMAP PA. Discharge point and downstream drainage areas as well as

Q_{7-10} flow were generated by USGS Stream Stats. USGS Stream Stats output files are included in Attachment A. In the absence of site-specific data, discharge temperature, stream temperature, and stream pH were assumed to be 20, 25, and 7 in accordance with the Ammonia Guidance. Stream width to depth was assumed to be 10 in accordance with DEP's *Technical Reference Guide (TRG) WQM 7.0 for Windows Wasteload Allocation Program for Dissolved Oxygen and Ammonia Nitrogen Version 1.* [Doc. No. 391-2000-007].

WQM 7.0 Modeling inputs are documented in the table below:

Discharge Characteristics		Basin/Stream Characteristics	
Parameter	**Value**	**Parameter**	**Value**
River Mile Index (RMI)	9.18	Drainage Area	3.95
Discharge Flow (MGD)	0.16	Q_{7-10} (cfs)	0.0457
Discharge Temp (^oC)	20	Low-flow yield (cfs/mi^2)	0.0115696
Ammonia-Nitrogen (mg/L)	25	Elevation (ft)	1060
$CBOD_5$ (mg/L)	25	Stream Width/Depth	10
		Stream Temp (^oC)	25
		Stream pH (s.u.)	7.0

The discharge was modeled using WQM 7.0 to evaluate the ammonia-nitrogen, $CBOD_5$, and DO parameters. The modeling confirmed that technology based effluent limits are appropriate for $CBOD_5$ and determined that water quality effluent limits are necessary for ammonia-nitrogen and DO. In accordance with DEP's SOP for *Establishing Effluent Limitations for Individual Sewage Permits* [SOP No. BCW-PMT-033, revised March 24, 2021 Version 1.9], winter ammonia-nitrogen limits are assessed by comparing the winter WQM 7.0 output value with one calculated by multiplying the summer limit by a multiplier of three. The more restrictive limit is then imposed. For this facility, the more restrictive limit comes from the winter model. WQM 7.0 output files are included in Attachment B.

Total Residual Chlorine Modeling

DEP's Total Residual Chlorine (TRC) Spreadsheet is a Microsoft Excel ® Program used to evaluate WQBELs for TRC using a mass balance. In accordance with the Department's SOP for *Establishing Effluent Limitations for Individual Sewage Permits* [SOP No. BCW-PMT-033 Version 1.9], default values of 0.3 mg/L and 0 mg/L for in-stream and discharge chlorine demand were used. Additionally, a discharge flow of 0.16 MGD and Q_{7-10} flow of 0.0457 were used.

TRC was modeled with the TRC Spreadsheet and it was determined that water quality-based effluent limits are appropriate for TRC.

Antidegradation Considerations

Claysville STP discharges to Dutch Fork, which is classified as a HQ-WWF.

The following Antidegradation Best Available Combination of Technologies (ABACT) effluent limits, at a minimum, will be established based on the requirements of DEP's *Water Quality Antidegradation Implementation Guidance* [Doc. No. 391-0300-002].

Parameter	Treatment Process Performance Expectations (mg/L)		
	<2,000 gpd	2,000-50,000 gpd	>50,000 gpd
$CBOD_5$ (May 1 – Oct. 31)	10	10	10
$CBOD_5$ (Nov. 1 – Apr. 30)	20	20	10
Suspended Solids	20	10	10
NH_3-N (May 1 – Oct. 31)	5.0	3.0	1.5
NH_3-N (Nov. 1 – Apr. 30)	15.0	9.0	4.5
Effective disinfection	Disinfection should be accomplished using a method that leaves no detectable residual. Disinfection using ultra-violet light or other non-chlorine based systems is encouraged and must be considered.		
Other parameters, as needed	*Determined by the size and characteristics of the proposed discharge, may include – NO_2/NO_3-N, Total Phosphorus, Copper, Lead, Zinc*		

Dutch Fork Lake Total Maximum Daily Load (TMDL)

Section 303(d) of the Clean Water Act and the U.S. Environmental Protection Agency's Water Quality Planning and Management Regulation (codified at Title 40 CFR 130) requires states to develop a TMDL for impaired water bodies. A TMDL establishes the amount of a pollutant that a water body can assimilate without exceeding water quality criteria for the pollutant. TMDLs also provide a scientific basis for states to establish water quality-based controls for reducing pollution from both point and non-point sources in order to restore and maintain the quality of the state's water resources. The Dutch Fork Lake TMDL was published February 25, 2003. The TMDL documents that a limit of 2 mg/L for phosphorus at the Claysville STP would be necessary to manage eutrophication, therefore a phosphorus limit of 2 mg/L will again be imposed.

Dissolved Oxygen Limits

An instantaneous minimum DO concentration of 7.0 mg/L was previously imposed using a 1980 AST/AWT Survey Report for Proposed Claysville-Donegal Wastewater Treatment Plant (Attachment C) as justification. The report, however, documents that an instantaneous minimum DO concentration limit of 5.0 mg/L should be imposed. In accordance with 40 CFR 122.44 (l)1.2.i.B.2, an exception can be made to antibacksliding if "the Administrator determines that technical mistakes … were made in issuing the permit." Based on the imposed limit being more restrictive than the suggested limit in the cited reference and 40 CFR 122.44 (l) 1.2.i.B.2 justifying reduction of permit limits where a technical mistake occurred, the instantaneous DO limit is being relaxed from 7.0 to 5.0 mg/L.

Permit Limits

The limits to be imposed, which are provided below, represent the most stringent limitations between the TBELs, WQBELs, and ABACT limits.

Parameter	Limit (mg/l)	SBC	Model	Basis
Dissolved Oxygen	5.0	Instantaneous Minimum	N/A	1980 AST/AWT Survey Report
$CBOD_5$	10	Average Monthly	N/A	Antidegradation ABACT
Ammonia-Nitrogen (summer)	1.5	Average Monthly	N/A	Antidegradation ABACT
Ammonia-Nitrogen (winter)	4.0	Average Monthly	N/A	Previous Permit limits
Total Residual Chlorine	0.02	Average Monthly	N/A	Antidegradation ABACT
Total Suspended Solids	10.0	Average Monthly	N/A	Antidegradation ABACT
Total Phosphorus	2.0	Average Monthly	N/A	Dutch Fork Lake TMDL

Please note that the concentration and mass loading limits for $CBOD_5$ are changing to be consistent with the Antidegradation ABACTs.

Please note that the TRC average monthly and instantaneous maximum limits are changing to equal the method detection limit of 0.02, which is the detection limit for EPA methods 330.5 and 330.4. This is in accordance with the ABACT for TRC to have "no detectable residue."

Please note, the average monthly, weekly average, and instantaneous maximum concentration limits and average monthly and weekly average mass loading limits for Total Suspended Solids have become more restrictive. This is applied in accordance with the ABACT requirements.

Please note that the Ammonia-Nitrogen winter limits are carried over from the previous permit consistent with the anti-backsliding regulations per 40 CFR 122.44.

Additional Considerations

In accordance with Section I.A. of DEP's SOP for *Establishing Effluent Limitations for Individual Sewage Permits* [SOP No. BCW-PMT-033 Version 1.9], pursuant to EPA's approval of Pennsylvania's 2017 Triennial Review of Water Quality Standards and corresponding regulatory changes published in the *Pennsylvania Bulletin* on July 11, 2020 and under the authority of 25 Pa. Code § 93.7(a) and § 92.a.61, sewage dischargers will include monitoring for *E. coli*. For new and reissued permit, a monitoring frequency of 1/quarter will be imposed for design flows ≥ 0.05 MGD and < 1MGD.

In accordance with Section I.A of the DEP's SOP for *Establishing Effluent Limitations for Individual Sewage Permits* [SOP No. BCW-PMT-033 Version 1.9], and under the authority of 25 Pa. Code § 92a.61(b), nutrient monitoring for total nitrogen and total phosphorus will be imposed for sewage facilities with a design flow greater than 2,000 GPD. The intent of this monitoring is to establish the nutrient load of the wastewater and evaluate the impact that load may have on the quality of the receiving stream. During the last permit cycle, total nitrogen monitoring resulted in four samples ranging from 19.5 to 31.4. Total phosphorus was sampled weekly and monthly average results ranged from 0.16 to 1.92. The SOP states that if the receiving stream is not impaired for nutrients, then discretion may be used in setting the monitoring frequency. Dutch Fork is not impaired for nitrogen; therefore, a monitoring frequency of 1/year will be imposed. Claysville STP is privy to the Dutch Fork Lake TMDL which necessitates a total phosphorus limit of 2 mg/L and weekly monitoring.

Monitoring frequency for the proposed effluent limits are based on Table 6-3, Self -Monitoring Requirements for Sewage Dischargers, from DEP's *Technical Guidance for the Development and Specification of Effluent Limitations* [Doc. No. 362-0400-001]. No changes are being made to sampling frequency during this permit cycle.

Conventional and toxic limits are rounded in accordance with the guidelines in Chapter 5 Section C.2. of DEP's *Technical Guidance for the Development and Specification of Effluent Limitations* [Doc. No. 362-0400-001]. Please note that average monthly mass loading limits for summer and winter ammonia-nitrogen, total phosphorus, and TSS, the weekly average mass loading limit for TSS, and the weekly average concentration limit for summer ammonia-nitrogen and TSS have all changed to be consistent with the rounding guidance.

Mass Loading Limits

Section IV.C of DEP's SOP for *Establishing Effluent Limitations for Individual Sewage Permits* [SOP No. BCW-PMT-033 Version 1.9] establishes mass loading limits for STPs at the discretion of the application manager. Claysville STP was previously a Publicly Owned Treatment Facility and was purchased by PA American Water in 2008. Mass loading limitations are imposed for POTWs in accordance with the SOP cited above and Table 5.3 of DEP's *Technical Guidance for the Development and Specification of Effluent Limitations* [Doc. No. 362-0400-001]. For the purposes of permitting limits, mass loading limits for ammonia-nitrogen, $CBOD_5$, TSS, and total phosphorus will continue to be imposed based on the following equation:

$$mass\ loading\ limit\ \left(\frac{lbs}{day}\right) = average\ annual\ flow\ (MGD) * concentration\ limit\ \left(\frac{mg}{L}\right) * 8.34\ (conversion\ factor)$$

The following mass loading limits are being imposed:

Parameter	Average Monthly (lbs/day)	Average Weekly (lbs/day)
Ammonia-Nitrogen Summer (mg/L)	2.0	3.0
Ammonia-Nitrogen Winter (mg/L)	5.0	8.0
$CBOD_5$ (mg/L)	10	15
TSS (mg/L)	33	50
Total Phosphorus	2.5	4.0

Influent Monitoring

Section IV.F.2 of DEP's SOP for *New and Reissuance Sewage Individual NPDES Permit Applications* [SOP No. BCW-PMT-002 Version 2.0] establishes influent BOD_5 and TSS monitoring for non-POTW facilities where justification is made in the fact sheet. The intent of influent BOD_5 and TSS monitoring is to verify compliance with the secondary treatment

requirement of 85% removal defined in 40 CFR §133.102. Claysville STP was previously a POTW and was privy to influent BOD_5 and TSS monitoring in accordance with 25 Pa Code § 92a.47(a)(3). This monitoring is being re-imposed in this permit.

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" (386-0400-001), 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	Recorded
pH (S.U.)	XXX	XXX	6.0	XXX	9.0	XXX	1/day	Grab
Dissolved Oxygen (DO)	XXX	XXX	5.0	XXX	XXX	XXX	1/day	Grab
Total Residual Chlorine (TRC)	XXX	XXX	XXX	0.02	XXX	0.02	1/day	Grab
Carbonaceous Biochemical Oxygen Demand ($CBOD_5$)	13	20	XXX	10	15	20	1/week	8-Hr Composite
Biochemical Oxygen Demand (BOD_5) Raw Sewage Influent	Report	Report Daily Max	XXX	Report	XXX	XXX	1/week	8-Hr Composite
Total Suspended Solids (TSS) Raw Sewage Influent	Report	Report Daily Max	XXX	Report	XXX	XXX	1/week	8-Hr Composite
Total Suspended Solids (TSS)	13	20	XXX	10	15	20	1/week	8-Hr Composite
Fecal Coliform (No./100 ml) Nov 1 - Apr 30	XXX	XXX	XXX	2000 Geo Mean	XXX	10000	1/week	Grab
Fecal Coliform (No./100 ml) May 1 - Oct 31	XXX	XXX	XXX	200 Geo Mean	XXX	400	1/week	Grab
E. Coli (No./100 ml)	XXX	XXX	XXX	XXX	XXX	Report	1/quarter	Grab
Total Nitrogen	XXX	XXX	XXX	Report Daily Max	XXX	XXX	1/year	8-Hr Composite
Ammonia-Nitrogen Nov 1 - Apr 30	5.0	8.0	XXX	4.0	6.0	8	1/week	8-Hr Composite
Ammonia-Nitrogen May 1 - Oct 31	2.0	3.0	XXX	1.5	2.0	3	1/week	8-Hr Composite

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		
Total Phosphorus	2.5	4.0	XXX	2.0	3.0	4	1/week	8-Hr Composite

Compliance Sampling Location:

Other Comments:

ATTACHMENT A

USGS Stream Stats Output Files

Discharge Point

StreamStats Report

Region ID: PA
Workspace ID: PA20230818120123436000
Clicked Point (Latitude, Longitude): 40.11493, -80.43153
Time: 2023-08-18 08:01:47 -0400

Collapse All

Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	3.95	square miles
ELEV	Mean Basin Elevation	1249	feet

Low-Flow Statistics Flow Report [Low Flow Region 4]

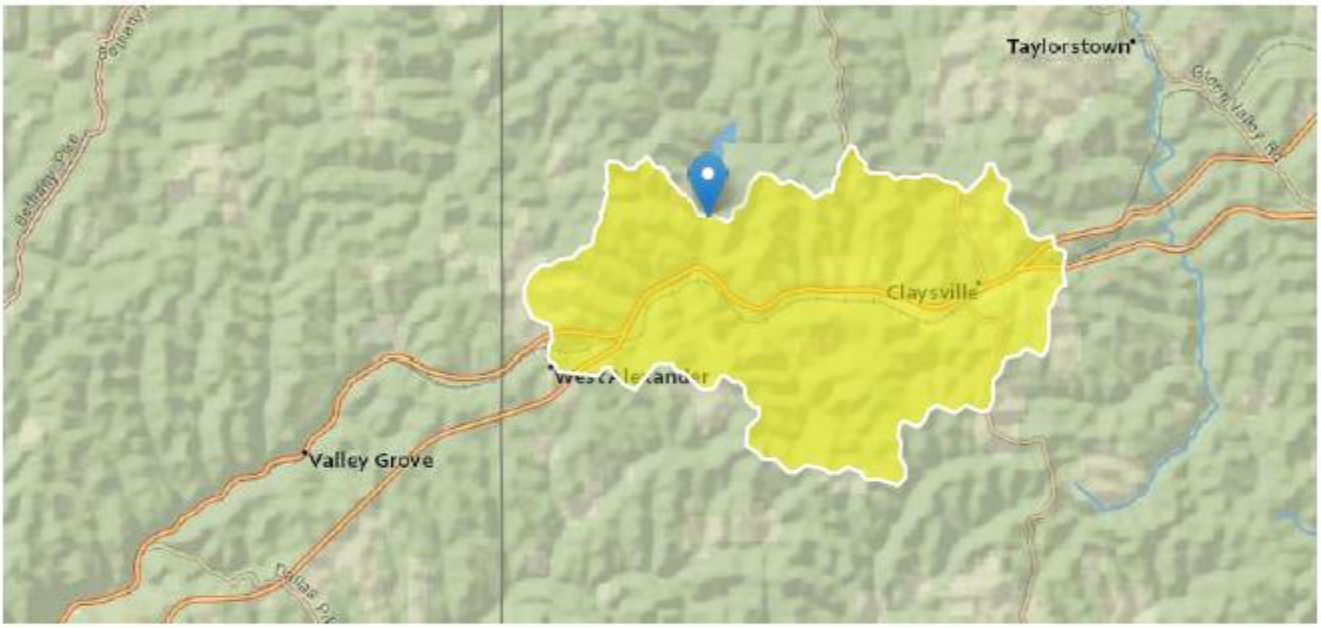
PII: Prediction Interval-Lower, Plu: Prediction Interval-Upper, ASEp: Average Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	SE	ASEp
7 Day 2 Year Low Flow	0.139	ft^3/s	43	43
30 Day 2 Year Low Flow	0.252	ft^3/s	38	38
7 Day 10 Year Low Flow	0.0457	ft^3/s	66	66
30 Day 10 Year Low Flow	0.0887	ft^3/s	54	54
90 Day 10 Year Low Flow	0.171	ft^3/s	41	41

End of Reach

StreamStats Report

Region ID: PA
Workspace ID: PA20230818121030652000
Clicked Point (Latitude, Longitude): 40.12987, -80.47315
Time: 2023-08-18 08:10:55 -0400



Collapse All

Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	15.4	square miles
ELEV	Mean Basin Elevation	1210	feet

ATTACHMENT B

WQM 7.0 Modeling Results

Summer Modeling

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
20E	32838	DUTCH FORK	9.180	1060.00	3.95	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	0.012	0.00	0.00	0.000	0.000	10.0	0.00	0.00	25.00	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
Claysville STP	PA0093165	0.0000	0.1600	0.0000	0.000	20.00	7.00

Parameter Data

Parameter Name	Disc Conc (mg/L)	Trib Conc (mg/L)	Stream Conc (mg/L)	Fate Coef (1/days)
CBOD5	25.00	2.00	0.00	1.50
Dissolved Oxygen	4.00	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
20E	32838	DUTCH FORK	5.920	980.00	15.40	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	0.012	0.00	0.00	0.000	0.000	10.0	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
20E	32838	DUTCH FORK

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												
9.180	0.05	0.00	0.05	.2475	0.00465	.421	8.97	21.29	0.08	2.566	20.78	7.00
Q1-10 Flow												
9.180	0.03	0.00	0.03	.2475	0.00465	NA	NA	NA	0.08	2.650	20.53	7.00
Q30-10 Flow												
9.180	0.06	0.00	0.06	.2475	0.00465	NA	NA	NA	0.08	2.488	21.00	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
20E	32838	DUTCH FORK

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
9.180	Claysville STP	16.04	17.94	16.04	17.94	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
9.180	Claysville STP	1.77	2.21	1.77	2.21	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)		
9.18	Claysville STP	25	25	2.21	2.21	5	5	0	0

WQM 7.0 D.O.Simulation

SWP Basin	Stream Code	Stream Name
20E	32838	DUTCH FORK

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
9.180	0.160	20.779	7.000
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
8.966	0.421	21.288	0.078
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
21.42	0.892	1.87	0.743
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
5.505	19.754	Owens	5
Reach Travel Time (days)			
2.566			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.257	16.89	1.54	7.50
0.513	13.33	1.28	7.82
0.770	10.52	1.05	8.06
1.026	8.30	0.87	8.12
1.283	6.54	0.72	8.12
1.539	5.16	0.59	8.12
1.796	4.07	0.49	8.12
2.052	3.21	0.41	8.12
2.309	2.54	0.34	8.12
2.566	2.00	0.28	8.12

WQM 7.0 Effluent Limits

SWP Basin	Stream Code	Stream Name
20E	32838	DUTCH FORK

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)
9.180	Claysville STP	PA0093165	0.000	CBOD5	25		
				NH3-N	2.21	4.42	
				Dissolved Oxygen			5

Winter Modeling

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
20E	32838	DUTCH FORK	9.180	1060.00	3.95	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	0.023	0.00	0.00	0.000	0.000	10.0	0.00	0.00	5.00	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
Claysville STP	PA0093165	0.0000	0.1600	0.0000	0.000	15.00	7.00

Parameter Data

Parameter Name	Disc Conc (mg/L)	Trib Conc (mg/L)	Stream Conc (mg/L)	Fate Coef (1/days)
CBOD5	25.00	2.00	0.00	1.50
Dissolved Oxygen	4.00	12.51	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
20E	32838	DUTCH FORK	5.920	980.00	15.40	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	0.023	0.00	0.00	0.000	0.000	10.0	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
20E	32838	DUTCH FORK

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												
9.180	0.09	0.00	0.09	.2475	0.00465	.43	9.35	21.74	0.08	2.366	12.30	7.00
Q1-10 Flow												
9.180	0.06	0.00	0.06	.2475	0.00465	NA	NA	NA	0.08	2.505	13.09	7.00
Q30-10 Flow												
9.180	0.12	0.00	0.12	.2475	0.00465	NA	NA	NA	0.09	2.246	11.66	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
20E	32838	DUTCH FORK

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
9.180	Claysville STP	24.1	29.8	24.1	29.8	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
9.180	Claysville STP	3.23	4.85	3.23	4.85	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)		
9.18	Claysville STP	25	25	4.85	4.85	4	4	0	0

WQM 7.0 D.O.Simulation

SWP Basin	Stream Code	Stream Name
20E	32838	DUTCH FORK

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
9.180	0.160	12.303	7.000
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
9.354	0.430	21.741	0.084
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
18.80	1.334	3.55	0.387
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
6.295	16.399	Owens	5
Reach Travel Time (days)			
2.366			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.237	15.06	3.23	8.92
0.473	12.07	2.95	9.27
0.710	9.67	2.69	9.52
0.946	7.75	2.46	9.63
1.183	6.21	2.24	9.63
1.419	4.97	2.05	9.63
1.656	3.99	1.87	9.63
1.893	3.19	1.70	9.63
2.129	2.56	1.55	9.63
2.366	2.05	1.42	9.63

WQM 7.0 Effluent Limits

SWP Basin	Stream Code	Stream Name
20E	32838	DUTCH FORK

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)
9.180	Claysville STP	PA0093165	0.000	CBOD5	25		
				NH3-N	4.85	9.7	
				Dissolved Oxygen			4

ATTACHMENT C

1980 AST/AWT Survey Report For Proposed Claysville-Donegal Wastewater Treatment Plant

AST/AWT Survey Report
For
Proposed Claysville-Donegal
Wastewater Treatment Plant

Pennsylvania Department of Environmental Resources
Bureau of Water Quality Management
Pittsburgh Regional Office
August 1980

the southwest of the Borough with approximately 10 percent of the planning area developed for residential, commercial and industrial usage and the remainder consisting of agricultural land and open space.

Dutch Fork Creek collects all of the run-off and drainage from the delineation area, and flows into Dutch Fork Lake, a Pennsylvania Fish Commission fishery approximately 3.5 miles downstream of Claysville Borough. Water from the lake flows into Buffalo Creek which ultimately discharges to the Ohio River.

Dutch Fork is classified HQ-WWF* (Chap. 93, DER's Rules and Regulations) with the following specific water quality criteria relative to domestic wastewater discharges. (Chap. 93 and 95, DER's Rules and Regulations)

Dissolved Oxygen - Minimum daily average 6.0 mg/l; no value less than 5.0 mg/l. For lakes, ponds and impoundments only, no value less than 5.0 mg/l at any time.

Bacteria - During the swimming season (May 1 through September 30) the fecal coliform level shall not exceed a geometric mean of 200 per 100 milliliters (ml) based on five consecutive samples each sample collected on different days; for the remainder of the year, the fecal coliform level shall not exceed a geometric

*High Quality - Warm Water Fish

reservoirs that have a detention time of 14 days or more shall be treated or otherwise abated to remove phosphorus such that the total phosphorus in the discharge does not exceed 0.5 mg/l as P.

(b) Detention time shall be determined by use of average daily stream flow and normal pool volume. In the absence of adequate stream flow records for the location, an average daily stream flow of 1.5 cfs per square mile of drainage area shall be used.

(c) Land disposal of wastes should be utilized wherever feasible to prevent the discharge of nutrients into lakes, ponds or reservoirs.

crayfish were observed along with green algae growth along the sides and bottom of the creek.

A comparison of D.O. measurements taken early in the morning prior to the start of the actual surveys and D.O. measurements taken during the surveys showed that there was no significant diurnal variations.

required to facilitate finding a correlation between stream flow, instream oxygen demanding constituent concentrations and uptake rates; using both sets of field based uptake rates for the simulations allows for a balancing of the high observed field rates, the existing raw waste discharges and high stream flow, and the expected lower stream uptake rates (after a wastewater treatment plant is installed for the Borough) at a lower (Q_{7-10}) stream flow.

The instream concentration for un-ionized ammonia, for the protection of a cold water fishery is 0.02 mg/l. (Source: EPA's Red Book). On the recommendations of our Central Office Aquatic Biologist, the NH_3-N concentration for Warm Water Fishery is taken as 2.5 times the value for a cold water fishery (i.e. instream un-ionized ammonia for warm water fishery = 0.05 mg/l). At an average pH value of 7.5 standard units the maximum instream ammonia (NH_3-N) concentration would be 2.75 mg/l. Although the survey data showed the average pH to be approximately 8.0 standard units we believe that 7.5 is more reasonable to represent a low flow situation. If a pH of 8.0 was used the result would be a much more restrictive allowable NH_3-N concentration (0.925 mg/l).

Using the reported design average wastewater flow, submitted for the proposed treatment plant, of 0.178 MGD (0.276 cfs), and assuming complete mixing at the point of discharge, the maximum effluent ammonia concentration would be:

$$NH_3\text{-}N_{eff.} = \frac{(Q_{STD} \times \text{CRITERIA}) - (Q_S \times C_S)}{Q_D} = \frac{(0.317 \times 2.75) - (0.041 \times 0.15^*)}{(0.276)} = 3.136 \text{ mg/l}$$

*0.15 mg/l NH_3-N, background concentration taken from the stream survey.

TABLE 1. Temperature Corrected Nitrogenous and Carbonaceous Rates

	Field K Rates	Temp. (Field)	K (at 25°C)
First Survey (8/9/79)	Kn = 3.43 Kc = 4.87	23.5°C "	3.67 5.22
Second Survey (5/7/80)	Kn = 5.3 Kc = 3.5	11.0°C "	10.1 6.66

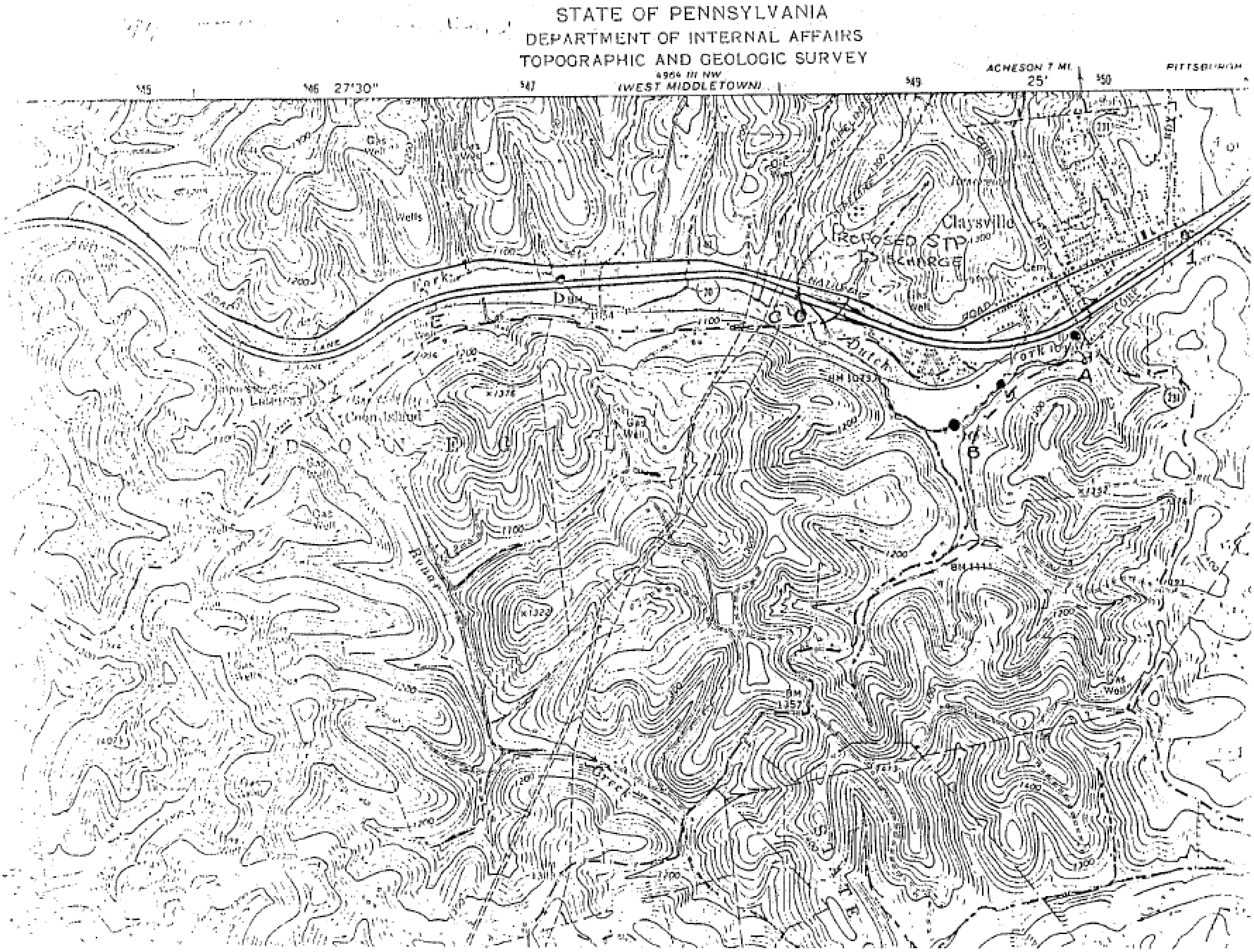
For sensitivity analysis three simulations were done over a range of reaeration values, using the temperature corrected K rates and inputting the above specified effluent D.O. and NH_3-N concentrations. The simulation results are shown in Table 2. (Only the results which do not violate the 5.0 mg/l D.O. criteria are tabulated. For the full range of values see the attached simulation result sheets).

TABLE 2. Model Simulation Results

Final Effluent Values	Kc = 5.22, Kn = 3.67			Kc = 6.66 Kn = 10.1		
	Reaeration Rate		Range	Reaeration Rate		Range
	25	30	35	25	30	35
BOD_5 (30 Day Ave)	10	10	15	5	10	10
NH_3-N (30 Day Ave)	2	2.5	2	2.5	1.5	2.5
D.O. Minimum	5	5	5	5	5	5

As the proposed wastewater treatment plant for the Claysville-Donegal area incorporates flows from projected future population, industrial and commercial activities and the wastewater facilities planning study anticipates no significant growth in carbonaceous non-point sources of

Parameter	30-Day Ave.	Instantaneous Max.
BOD_5	10 mg/l	20 mg/l
TSS	25 mg/l	50 mg/l
Dissolved Oxygen	5.0 mg/l minimun at all times	
Phosphorus - P	0.5 mg/l	1.0 mg/l
Ammonia Nitrogen	2.5 mg/l For the period 6/1 to 10/31	5.0 mg/l
	7.5 mg/l For the remainder of the year	15 mg/l


STATE OF PENNSYLVANIA
DEPARTMENT OF INTERNAL AFFAIRS
TOPOGRAPHIC AND GEOLOGIC SURVEY
(WEST MIDDLETOWN)
27'30"
25'
ACHESON 7 MI.
PITTSBURGH
Claysville
PROPOSED STP
DISCHARGE
Dutch
Fork
Coon Island
Gas Well
Cem
A
B
C