Pennsylvania Department of Environmental Protection

Southeast Regional Office
CLEAN WATER PROGRAM

Application Type	**Renewal**	Application No.	**PA0050237**
Facility Type	**Non-Municipal**	APS ID	**1127411**
Major / Minor	**Minor**	Authorization ID	**1509463**

NPDES PERMIT FACT SHEET INDIVIDUAL SEWAGE

Applicant and Facility Information

Applicant Name	**Walnut Hill Utility Co.**	Facility Name	**Walnut Hill Utility STP**
Applicant Address	400 Ashley Court	Facility Address	125 Brandywine Circle
	Glen Mills, PA 19342-2046		Glen Mills, PA 19342
Applicant Contact	Robert Sacks	Facility Contact	Michael A Bostic
Applicant Phone	(610) 633-7850	Facility Phone	(484) 908-4330
Client ID	207919	Site ID	458839
Ch 94 Load Status	Not Overloaded	Municipality	Chester Heights Borough
Connection Status		County	Delaware
Date Application Received	November 23, 2024	EPA Waived?	Yes
Date Application Accepted		If No, Reason	

Purpose of Application: NPDES permit renewal application.

Summary of Review

The Pa Department of Environmental Protection (PADEP/Department) received an NPDES permit renewal application from Walnut Hills Utility Company (permittee) on November 23, 2024 for Permittee's Walnut Hill Utility STP (facility). This is a minor sewage facility with a design flow of 0.15 MGD that discharges into Chester Creek (TSF, MF) in state watershed 3-G. The current permit will expire on June 30, 2024. The terms and conditions of the current permit is automatically extended since the renewal application was received at least 180 days prior to expiration date. Renewal NPDES permit application under Clean Water Program are not covered by PADEP's PDG per 021-2100-001. This fact sheet is developed in accordance with 40 CFR §124.56.

Changes to existing permit: Added: E. Coli.

Sludge use and disposal description and location(s): Digested sludge are hauled-off by licensed hauler.

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
√		Reza H. Chowdhury, E.I.T. / Project Manager	March 12, 2025
X		Pravin Patel Pravin C. Patel, P.E. / Environmental Engineer Manager	03/13/2025

Discharge, Receiving Waters and Water Supply Information

Outfall No.	001	Design Flow (MGD)	.15
Latitude	39º 54' 27.8"	Longitude	-75º 28' 44.64"
Quad Name	Media	Quad Code	1942
Wastewater Description:	Sewage Effluent		
Receiving Waters	Chester Creek (TSF, MF)	Stream Code	00520
NHD Com ID	25607107	RMI	12.23
Drainage Area	29.1 mi^2	Yield (cfs/mi^2)	0.247
Q_{7-10} Flow (cfs)	**7.2**	Q_{7-10} Basis	See below
Elevation (ft)	244.74	Slope (ft/ft)	
Watershed No.	3-G	Chapter 93 Class.	TSF, MF
Existing Use	**TSF**	Existing Use Qualifier	Ch. 93
Exceptions to Use		Exceptions to Criteria	
Assessment Status	Impaired		
Cause(s) of Impairment	CAUSE UNKNOWN, FLOW REGIME MODIFICATION, SILTATION		
Source(s) of Impairment	URBAN RUNOFF/STORM SEWERS, URBAN RUNOFF/STORM SEWERS, URBAN RUNOFF/STORM SEWERS		
TMDL Status	**None**	Name	

Background/Ambient Data		Data Source
pH (SU)	7.46	90th percentile, Feb 2024-Jan 2025
Temperature (°C)	20	Default
Hardness (mg/L)	100	Default
Other:		

Nearest Downstream Public Water Supply Intake		Aqua PA Main System Lower Merion, Montgomery	
PWS Waters	Chester Creek	Flow at Intake (cfs)	
PWS RMI	12.18	Distance from Outfall (mi)	12.61

Changes Since Last Permit Issuance: none

Stream Flow:
The USGS's web based watershed delineation tool StreamStats (accessible at https://streamstats.usgs.gov/ss/, accessed on March 11, 2025) was utilized to determine the drainage area at discharge point. The drainage area at Outfall 001 was found to be 29.1 mi^2, Q_{7-10} is 7.2 cfs, and calculated yield is 0.247 $cfs.mi^2$. Default Q_{1-10}:Q_{30-10} of 0.64 and default Q_{30-10}:Q_{7-10} of 1.36 (per 391-2000-007) will be used for modeling.

PWS Intake:
The nearest PWS intake is Aqua PA main system in Lower Merion township, Montgomery County, approximately 12.61 miles downstream of the outfall 001.

Wastewater Characteristics:
90th percentile pH from daily eDMR for the period of February 1, 2024 through January 31, 2025 is 7.46, default discharge temperature of 25°C, and default hardness of 100 mg/l will be used for modeling.

Background data:
Default pH of 7.0, default temperature of 20°C, and default hardness of 100 mg/l will be used for modeling, as appropriate.

Antidegradation (93.4):
The effluent limits for this discharge have been developed to ensure that existing in-stream water uses and the level of water quality necessary to protect the existing uses are maintained and protected. The receiving stream is designated as Trout Stocking (TSF) and Migratory Fishes (MF.) No High-Quality stream is impacted by this discharge. No Exceptional-Value water is impacted by this discharge.

Class A Wild Trout Fisheries:
No Class A Wild Trout Fisheries are impacted by this discharge.

Treatment Facility Summary

Treatment Facility Name: Walnut Hill Utility Co. STP

WQM Permit No.	Issuance Date

Waste Type	Degree of Treatment	Process Type	Disinfection	Avg Annual Flow (MGD)
Sewage	Secondary	Extended Aeration	Gas Chlorine	0.15

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

Changes Since Last Permit Issuance: None

Other Comments:
Walnut Hill Utility Company owns and operates a Wastewater Treatment Plant, located in 125 Brandywine Circle, Glen Mills, PA 19342. This is a minor sewage treatment plant with an average annual design flow of 0.15 MGD. Day-to-day operation is conducted by KBX Golden. Per recent inspection on February 21, 2024, the treatment plant consists of the following treatment units: Two influent screens, two aeration basins, two primary clarifiers, one chlorine contact tank, and two sludge holding tanks. The sewage sludge and biosolids are sent to DELCORA for further treatment and ultimate disposal.

The following wastewater treatment chemicals are being used at the facility:

Wastewater Treatment Chemical	Purpose	Maximum Usage Rate	Units
Ferric Chloride	Phosphorus Removal	4.5	gals/day
Soda Ash	pH adjustment	100	lbs/day
Sodium Hypochlorite	Disinfection	4	gals/day
Sodium Sulfite	Dechlorination	2	lbs/day

It should be noted that the facility pipes down the treated effluent all the way to the Chester Creek at an approximate location 39º 54' 27.8", -75º 28' 44.64".

Compliance History

DMR Data for Outfall 001 (from November 1, 2023 to October 31, 2024)

Parameter	OCT-24	SEP-24	AUG-24	JUL-24	JUN-24	MAY-24	APR-24	MAR-24	FEB-24	JAN-24	DEC-23	NOV-23
Flow (MGD) Average Monthly	0.03035	0.03111	0.03123	0.030411	0.02996	0.02987	0.03278	0.03342	0.03284	0.03582	0.04079	0.03964
Flow (MGD) Daily Maximum	0.03975	0.03984	0.04417	0.04533	0.04719	0.04395	0.06297	0.05574	0.03284	0.05043	0.07869	0.10323
pH (S.U.) Instantaneous Minimum	6.81	6.85	7.07	7.09	7.08	7.04	6.98	7.0	6.89	6.9	6.96	6.88
pH (S.U.) Instantaneous Maximum	7.54	7.62	7.53	7.58	7.63	7.6	7.51	7.55	7.40	7.63	7.67	7.64
DO (mg/L) Instantaneous Minimum	5.37	5.4	5.31	4.97	5.19	4.86	5.87	5.39	6.47	6.3	6.23	5.67
TRC (mg/L) Average Monthly	0.06	0.1	0.09	0.1	0.08	0.04	0.05	0.1	0.15	0.08	0.21	0.157
TRC (mg/L) Instantaneous Maximum	0.58	0.9	1.11	0.94	0.37	0.18	0.21	0.55	1.1	0.48	1.12	0.61
CBOD5 (lbs/day) Average Monthly	0.73	0.96	1.02	1.00	0.98	1.22	< 1.56	0.88	0.877	0.90	2.81	1.63
CBOD5 (mg/L) Average Monthly	< 2.88	< 3.7	3.92	< 3.93	3.93	4.9	< 5.7	< 3.15	< 3.2	< 3.0	< 8.26	< 4.93
TSS (lbs/day) Average Monthly	1.58	1.86	1.65	1.47	1.51	1.32	< 1.37	1.39	1.37	1.49	1.93	1.95
TSS (mg/L) Average Monthly	< 6.24	< 7.18	< 6.32	< 5.8	6.05	< 5.28	< 5.0	< 5.0	< 5.0	< 5.0	< 5.68	< 5.9
Total Dissolved Solids (mg/L) Daily Maximum		385			400			483			659	
Fecal Coliform (No./100 ml) Geometric Mean	< 3.34	< 3.18	32.08	< 6.03	6.35	< 4.37	< 1.0	< 1	< 1	< 2.44	16.01	10.33
Fecal Coliform (No./100 ml) Instantaneous Maximum	48.8	102.2	184.2	40.4	55.6	39.9	< 1.0	< 1	< 1	85.7	75	181
Total Nitrogen (mg/L) Average Monthly	< 24.39	23.53	< 27.12	< 24.02	28.71	< 30.32	< 26.49	< 27.27	< 27.89	< 25.71	31.12	34.95

Ammonia (lbs/day) Average Monthly	0.03	0.03	0.03	0.03	0.03	0.03	< 0.03	0.03	0.033	0.036	0.04	0.04
Ammonia (mg/L) Average Monthly	< 0.13	< 0.1	< 0.1	< 0.1	< 0.1	< 0.13	< 0.1	0.1	< 0.1	< 0.102	< 0.10	< 0.11
Total Phosphorus (lbs/day) Average Monthly	0.09	0.16	0.18	0.29	0.16	0.14	0.08	0.06	0.08	0.063	0.14	0.121
Total Phosphorus (mg/L) Average Monthly	0.36	0.61	0.7	1.13	0.64	0.56	0.28	0.20	0.3	0.212	0.416	0.37

Compliance History

Effluent Violations for Outfall 001, from: December 1, 2023 To: October 31, 2024

Parameter	Date	SBC	DMR Value	Units	Limit Value	Units
Total Phosphorus	07/31/24	Avg Mo	1.13	mg/L	1.0	mg/L

Summary of Inspections:

February 21, 2024: CEI conducted. No violation noted. Final effluent appeared clear. Outfall wasn't observed as the trail was covered in snow.

March 21, 2023: RTPT conducted. No violation noted. Effluent clean with no odor detected. No observable issues in the receiving stream. Upstream and downstream conditions appear similar.

Existing Limits

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	Continuous	Metered
pH (S.U.)	XXX	XXX	6.0 Inst Min	XXX	XXX	9.0	1/day	Grab
Dissolved Oxygen	XXX	XXX	4.0 Inst Min	XXX	XXX	XXX	1/day	Grab
Total Residual Chlorine (TRC)	XXX	XXX	XXX	0.5	XXX	1.2	1/day	Grab
Carbonaceous Biochemical Oxygen Demand (CBOD5) Nov 1 - Apr 30	31.3	XXX	XXX	25.0	XXX	50	1/week	24-Hr Composite
Carbonaceous Biochemical Oxygen Demand (CBOD5) May 1 - Oct 31	18.8	XXX	XXX	15.0	XXX	30	1/week	24-Hr Composite
Total Suspended Solids	37.5	XXX	XXX	30.0	XXX	60	1/week	24-Hr Composite
Total Dissolved Solids	XXX	XXX	XXX	Report Daily Max	XXX	XXX	1/quarter	24-Hr Composite
Fecal Coliform (No./100 ml) Oct 1 - Apr 30	XXX	XXX	XXX	200 Geo Mean	XXX	1000*	1/week	Grab
Fecal Coliform (No./100 ml) May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	XXX	1000	1/week	Grab
Total Nitrogen	XXX	XXX	XXX	Report	XXX	XXX	1/week	24-Hr Composite
Ammonia-Nitrogen Nov 1 - Apr 30	12.5	XXX	XXX	10.0	XXX	20	1/week	24-Hr Composite
Ammonia-Nitrogen May 1 - Oct 31	6.3	XXX	XXX	5.0	XXX	10	1/week	24-Hr Composite
Total Phosphorus Nov 1 - Apr 30	2.5	XXX	XXX	2.0	XXX	4	1/week	24-Hr Composite
Total Phosphorus May 1 - Oct 31	1.25	XXX	XXX	1.0	XXX	2	1/week	24-Hr Composite

Development of Effluent Limitations

Outfall No. 001 **Design Flow (MGD)** .15
Latitude 39º 54' 27.8" **Longitude** -75º 28' 44.64"
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)
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)
Total Residual Chlorine	0.5	Average Monthly	-	92a.48(b)(2)

Mass-Based Limits

The federal regulation at 40 CFR 122.45(f) requires that effluent limits be expressed in terms of mass, if possible. The regulation at 40 CFR 122.45(b) requires that effluent limitations for POTWs be calculated based on the design flow of the facility. The mass-based limits are expressed in pounds per day and are calculated as follows:

Mass based limit (lb/day) = concentration limit (mg/L) × design flow (mgd) × 8.34

Model input data

The following data will be used for modeling, as needed:

- Discharge pH 7.46 (90^{th} percentile, Feb 24-Jan 25, daily eDMR data)
- Discharge Temperature 25°C (Default)
- Discharge Hardness 100 mg/l (Default)
- Stream pH 7.0 (Default)
- Stream Temperature 20.0°C (Default)
- Stream Hardness 100 mg/l (Default)

The following two nodes were used in modeling:

Node 1: At the outfall 001 on Chester Creek (00520)
Elevation: 143.4 ft (National Map-Advanced Viewer, 03/11/2025)
Drainage Area: 29.1 mi^2 (StreamStats Version 3.0, 03/11/2025)
River Mile Index: 12.23 (PA DEP eMapPA)
Low Flow Yield: 0.247 cfs/mi^2
Q_{7-10}: 7.2 cfs
Discharge Flow: 0.15 MGD

Node 2: At confluence with UNT 00584 to Chester Creek RMI 10.96
Elevation: 128.8 ft (National Map-Advanced Viewer, 03/11/2025)
Drainage Area: 30.6 mi^2 (StreamStats Version 3.0, 03/11/2025)
River Mile Index: 10.96 (PA DEP eMapPA)

Low Flow Yield: 0.247 cfs/mi^2
Discharge Flow: 0.0 MGD

WQM 7.0 Model
WQM 7.0 version 1.11 is a water quality model designed to assist DEP to determine appropriate effluent limits for $CBOD_5$, NH_3-N and DO. The model simulates two basic processes. In the NH_3-N module, the model simulates the mixing and degradation of NH_3-N in the stream and compares calculated instream NH_3-N concentrations to NH_3-N water quality criteria. In the D.O. module, the model simulates the mixing and consumption of D.O. in the stream due to the degradation of $CBOD_5$ and NH_3N and compares calculated instream D.O. concentrations to D.O. water quality criteria. The model was utilized for this permit renewal by using Q_{7-10} and current background water quality levels of the stream.

NH_3-N
WQM 7.0 suggested NH_3-N limit of 5 mg/l as monthly average and 10 mg/l as IMAX limit during summer to protect water quality standards. The winter limits are calculated by multiplying the summer limits with a factor of 2. These limits are the same as existing limits and will be carried over.

CBOD5
WQM 7.0 suggests CBOD5 limit of 15.0 mg/l as AML during the summer season which is the same as the existing limits. Existing limits will be carried over.

DO
WQM 7.0 suggests minimum DO of 4.0 mg/l which is the model input and same as existing limit. Existing limit will be carried over.

Toxics Management Spreadsheet (TMS)
Toxics modeling wasn't conducted since this is a minor facility and doesn't receive waste from industrial or commercial contributors.

Other Requirements:

Total Nitrogen monitoring:
PADEP's SOP BCW-PMT-033 recommends monitoring for Total Nitrogen for facilities with design flow more than 2000-GPD, which is also supported by Pa Code 25 Ch. 92a.61. Current monitoring requirement will be continued.

Total Phosphorus:
Current permit has seasonal total phosphorus limits which will be carried over.

Fecal Coliform:
The seasonal effluent limitations for fecal coliform are based on Chapter 92a (§ 92a.47(4) & (5)) of DEP's regulations and Delaware River Basin Commission's (DRBC's) Water Quality Regulations at § 4.30.4.A. DEP's regulations govern the summer limits for fecal coliform while the winter limits are based on DRBC's regulations. The DRBC regulations state that during winter season from October through April, the instantaneous maximum concentration of fecal coliform organisms shall not be greater than 1,000 per 100 milliliters in more than 10 percent of the samples tested. The existing limits will be carried over.

E. Coli:
Pa Code 25 § 92a. 61 requires monitoring of E. Coli. DEP's SOP titled "Establishing Effluent Limitations for Individual Sewage Permits (BCW-PMT-033, revised March 24, 2021) recommends quarterly E. Coli monitoring for minor sewage dischargers with design flow between 50,000-GPD to less than 1 MGD. This requirement will be applied from this permit term.

pH:
The TBEL for pH is above 6.0 and below 9.0 S.U. (40 CFR §133.102(c) and Pa Code 25 §§ 95.2(1), 92a.47) which are existing limits and will be carried over.

Total Suspended Solids (TSS):
There is no water quality criterion for TSS. The existing limits of 30 mg/L average monthly and 60 mg/L instantaneous maximum will remain in the permit based on the minimum level of effluent quality attainable by secondary treatment, 25

Pa. Code § 92a.47 and 40CFR 133.102(b). The mass based average monthly limit is calculated to be 37.5 lbs./day, which is the current limit and will be carried over.

Total Residual Chlorine (TRC):
The attached computer printout utilizes the equation and calculations as presented in the Department's 2003 Implementation Guidance for Total Residual Chlorine (TRC) (ID#391-2000-015) for developing chlorine limitations. The attached printout indicates that a water quality limit of 0.5 mg/l would be needed to prevent toxicity concerns at the discharge point for Outfall 001. The recommended IMAX limit is 1.6 mg/l. The current permit has IMAX limit of 1.2 mg/l which is more stringent and will be carried over.

Monitoring Frequency and Sample Types:
Otherwise specified above, the monitoring frequency and sample type of compliance monitoring for existing parameters are recommended by DEP's SOP and Permit Writers Manual and/or on a case-by-case basis using best professional judgment (BPJ).

Flow Monitoring Requirement:
The requirement to monitor the volume of effluent will remain in the draft permit per 40 CFR § 122.44(i)(1)(ii).

Anti-Backsliding
Anti-backsliding prohibition is justified in sections where an exception is justified for the affected pollutant(s). For remaining pollutants, this prohibition isn't applicable since the proposed limits are at least as stringent as were in current 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	Average Weekly	Minimum	Average Monthly	Maximum	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
DO	XXX	XXX	4.0 Inst Min	XXX	XXX	XXX	1/day	Grab
TRC	XXX	XXX	XXX	0.5	XXX	1.2	1/day	Grab
CBOD5 Nov 1 - Apr 30	31.3	XXX	XXX	25.0	XXX	50	1/week	24-Hr Composite
CBOD5 May 1 - Oct 31	18.8	XXX	XXX	15.0	XXX	30	1/week	24-Hr Composite
TSS	37.5	XXX	XXX	30.0	XXX	60	1/week	24-Hr Composite
Total Dissolved Solids	XXX	XXX	XXX	Report Daily Max	XXX	XXX	1/quarter	24-Hr Composite
Fecal Coliform (No./100 ml) Oct 1 - Apr 30	XXX	XXX	XXX	200 Geo Mean	XXX	1000	1/week	Grab
Fecal Coliform (No./100 ml) May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	XXX	1000	1/week	Grab
E. Coli (No/100 ml)	XXX	XXX	XX	XXX	Report IMAX	XXX	1/quarter	Grab
Total Nitrogen	XXX	XXX	XXX	Report	XXX	XXX	1/week	24-Hr Composite
Ammonia Nov 1 - Apr 30	12.5	XXX	XXX	10.0	XXX	20	1/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	Average Weekly	Minimum	Average Monthly	Maximum	Instant. Maximum		
Ammonia May 1 - Oct 31	6.3	XXX	XXX	5.0	XXX	10	1/week	24-Hr Composite
Total Phosphorus Nov 1 - Apr 30	2.5	XXX	XXX	2.0	XXX	4	1/week	24-Hr Composite
Total Phosphorus May 1 - Oct 31	1.25	XXX	XXX	1.0	XXX	2	1/week	24-Hr Composite

Compliance Sampling Location: At Outfall 001

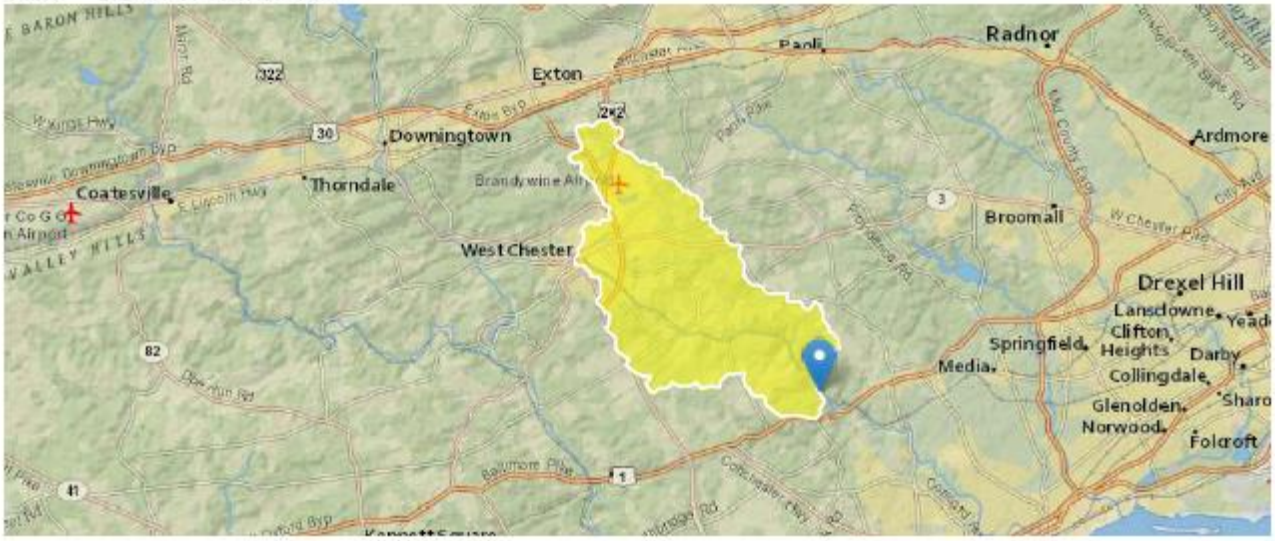
Other Comments:

Tools and References Used to Develop Permit	
☒	WQM for Windows Model (see Attachment)
☐	Toxics Management Spreadsheet (see Attachment)
☒	TRC Model Spreadsheet (see Attachment)
☐	Temperature Model Spreadsheet (see Attachment)
☐	Water Quality Toxics Management Strategy, 361-0100-003, 4/06.
☐	Technical Guidance for the Development and Specification of Effluent Limitations, 386-0400-001, 10/97.
☐	Policy for Permitting Surface Water Diversions, 386-2000-019, 3/98.
☐	Policy for Conducting Technical Reviews of Minor NPDES Renewal Applications, 386-2000-018, 11/96.
☐	Technology-Based Control Requirements for Water Treatment Plant Wastes, 386-2183-001, 10/97.
☐	Technical Guidance for Development of NPDES Permit Requirements Steam Electric Industry, 386-2183-002, 12/97.
☐	Pennsylvania CSO Policy, 386-2000-002, 9/08.
☐	Water Quality Antidegradation Implementation Guidance, 391-0300-002, 11/03.
☐	Implementation Guidance Evaluation & Process Thermal Discharge (316(a)) Federal Water Pollution Act, 386-2000-008, 4/97.
☐	Determining Water Quality-Based Effluent Limits, 386-2000-004, 12/97.
☐	Implementation Guidance Design Conditions, 386-2000-007, 9/97.
☐	Technical Reference Guide (TRG) WQM 7.0 for Windows, Wasteload Allocation Program for Dissolved Oxygen and Ammonia Nitrogen, Version 1.0, 386-2000-016, 6/2004.
☐	Interim Method for the Sampling and Analysis of Osmotic Pressure on Streams, Brines, and Industrial Discharges, 386-2000-012, 10/1997.
☐	Implementation Guidance for Section 95.6 Management of Point Source Phosphorus Discharges to Lakes, Ponds, and Impoundments, 386-2000-009, 3/99.
☐	Technical Reference Guide (TRG) PENTOXSD for Windows, PA Single Discharge Wasteload Allocation Program for Toxics, Version 2.0, 386-2000-015, 5/2004.
☐	Implementation Guidance for Section 93.7 Ammonia Criteria, 386-2000-022, 11/97.
☐	Policy and Procedure for Evaluating Wastewater Discharges to Intermittent and Ephemeral Streams, Drainage Channels and Swales, and Storm Sewers, 386-2000-013, 4/2008.
☐	Implementation Guidance Total Residual Chlorine (TRC) Regulation, 386-2000-011, 11/1994.
☐	Implementation Guidance for Temperature Criteria, 386-2000-001, 4/09.
☐	Implementation Guidance for Section 95.9 Phosphorus Discharges to Free Flowing Streams, 386-2000-021, 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, 386-2000-020, 10/97.
☐	Field Data Collection and Evaluation Protocol for Determining Stream and Point Source Discharge Design Hardness, 386-2000-005, 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, 386-2000-010, 3/1999.
☐	Design Stream Flows, 386-2000-003, 9/98.
☐	Field Data Collection and Evaluation Protocol for Deriving Daily and Hourly Discharge Coefficients of Variation (CV) and Other Discharge Characteristics, 386-2000-006, 10/98.
☐	Evaluations of Phosphorus Discharges to Lakes, Ponds and Impoundments, 386-3200-001, 6/97.
☐	Pennsylvania's Chesapeake Bay Tributary Strategy Implementation Plan for NPDES Permitting, 4/07.
☐	SOP: BCW-PMT-033
☐	Other:

StreamStats at Outfall 001

PA0050237 at Outfall 001

Region ID: PA
Workspace ID: PA20250311184650180000
Clicked Point (Latitude, Longitude): 39.90770, -75.47908
Time: 2025-03-11 14:47:25 -0400



Collapse All

Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
BSLOPD	Mean basin slope measured in degrees	4.1089	degrees
DRNAREA	Area that drains to a point on a stream	29.1	square miles
ROCKDEP	Depth to rock	5	feet
URBAN	Percentage of basin with urban development	41.1945	percent

Low-Flow Statistics

Low-Flow Statistics Parameters [Low Flow Region 1]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
BSLOPD	Mean Basin Slope degrees	4.1089	degrees	1.7	6.4
DRNAREA	Drainage Area	29.1	square miles	4.78	1150
ROCKDEP	Depth to Rock	5	feet	4.13	5.21
URBAN	Percent Urban	41.1945	percent	0	89

Low-Flow Statistics Flow Report [Low Flow Region 1]

PIL: Lower 90% Prediction Interval, PIU: Upper 90% Prediction Interval, ASEp: Average Standard Error of Prediction, SE: Standard Error, PC: Percent Correct, RMSE: Root Mean Squared Error, PseudoR^2: Pseudo R Squared (other -- see report)

Statistic	Value	Unit	SE	ASEp
7 Day 2 Year Low Flow	12.3	ft^3/s	46	46
30 Day 2 Year Low Flow	15.7	ft^3/s	38	38
7 Day 10 Year Low Flow	7.2	ft^3/s	51	51
30 Day 10 Year Low Flow	9.12	ft^3/s	46	46
90 Day 10 Year Low Flow	13.6	ft^3/s	41	41

Low-Flow Statistics Citations

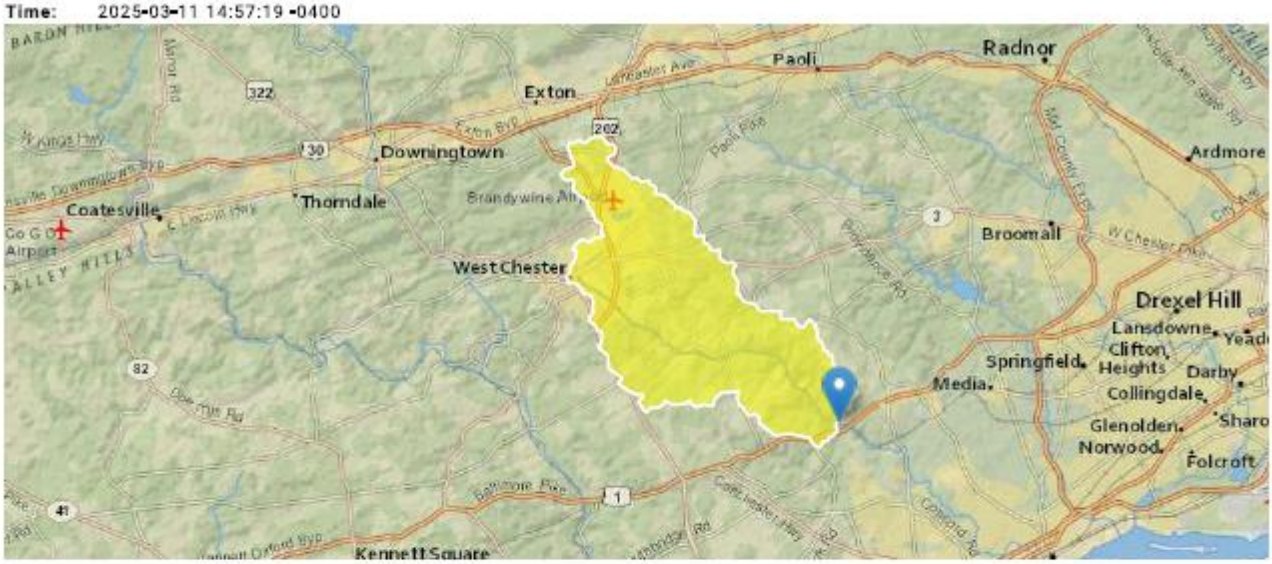
Stuckey, M.H.,2006, Low-flow, base-flow, and mean-flow regression equations for Pennsylvania streams: U.S. Geological Survey Scientific Investigations Report 2006-5130, 84 p. (http://pubs.usgs.gov/sir/2006/5130/)

Application Version: 4.28.0
StreamStats Services Version: 1.2.22
NSS Services Version: 2.2.1

StreamStats at node 2

PA0050237 at node 2

Region ID: PA
Workspace ID: PA20250311185651603000
Clicked Point (Latitude, Longitude): 39.90355, -75.46603
Time: 2025-03-11 14:57:19 -0400



Collapse All

Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
BSLOPD	Mean basin slope measured in degrees	4.2021	degrees
DRNAREA	Area that drains to a point on a stream	30.6	square miles
ROCKDEP	Depth to rock	5	feet
URBAN	Percentage of basin with urban development	39.1956	percent

Low-Flow Statistics

Low-Flow Statistics Parameters [Low Flow Region 1]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
BSLOPD	Mean Basin Slope degrees	4.2021	degrees	1.7	6.4
DRNAREA	Drainage Area	30.6	square miles	4.78	1150
ROCKDEP	Depth to Rock	5	feet	4.13	5.21
URBAN	Percent Urban	39.1956	percent	0	89

Low-Flow Statistics Flow Report [Low Flow Region 1]

PIL: Lower 90% Prediction Interval, PIU: Upper 90% Prediction Interval, ASEp: Average Standard Error of Prediction, SE: Standard Error, PC: Percent Correct, RMSE: Root Mean Squared Error, PseudoR^2: Pseudo R Squared (other -- see report)

Statistic	Value	Unit	SE	ASEp
7 Day 2 Year Low Flow	13	ft^3/s	46	46
30 Day 2 Year Low Flow	16.4	ft^3/s	38	38
7 Day 10 Year Low Flow	7.59	ft^3/s	51	51
30 Day 10 Year Low Flow	9.57	ft^3/s	46	46
90 Day 10 Year Low Flow	14.1	ft^3/s	41	41

Low-Flow Statistics Citations

Stuckey, M.H.,2006, Low-flow, base-flow, and mean-flow regression equations for Pennsylvania streams: U.S. Geological Survey Scientific Investigations Report 2006-5130, 84 p. (http://pubs.usgs.gov/sir/2006/5130/)

Application Version: 4.28.0
StreamStats Services Version: 1.2.22
NSS Services Version: 2.2.1

WQM 7.0

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
03G	520	CHESTER CREEK	12.230	143.40	29.10	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	0.247	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
Walnut Hill STP	PA0050237	0.1500	0.1500	0.1500	0.000	25.00	7.46

Parameter Data

Parameter Name	Disc Conc (mg/L)	Trib Conc (mg/L)	Stream Conc (mg/L)	Fate Coef (1/days)
CBOD5	15.00	2.00	0.00	1.50
Dissolved Oxygen	4.00	8.24	0.00	0.00
NH3-N	5.00	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
03G	520	CHESTER CREEK	10.960	128.80	30.60	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	0.247	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 Wasteload Allocations

SWP Basin	Stream Code	Stream Name
03G	520	CHESTER CREEK

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
12.230	Walnut Hill STP	16.23	10	16.23	10	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
12.230	Walnut Hill STP	1.87	5	1.87	5	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)		
12.23	Walnut Hill STP	15	15	5	5	4	4	0	0

WQM 7.0 D.O.Simulation

SWP Basin	Stream Code	Stream Name
03G	520	CHESTER CREEK

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
12.230	0.150	20.156	7.009
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
36.822	0.702	52.437	0.287
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
2.41	0.248	0.16	0.708
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
8.110	5.959	Tsivoglou	4
Reach Travel Time (days)			
0.270			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.027	2.39	0.15	8.22
0.054	2.37	0.15	8.22
0.081	2.36	0.15	8.22
0.108	2.34	0.14	8.22
0.135	2.33	0.14	8.22
0.162	2.31	0.14	8.22
0.189	2.30	0.14	8.22
0.216	2.28	0.13	8.22
0.243	2.26	0.13	8.22
0.270	2.25	0.13	8.22

WQM 7.0 Hydrodynamic Outputs

SWP Basin	Stream Code	Stream Name
03G	520	CHESTER CREEK

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												
12.230	7.19	0.00	7.19	.2321	0.00218	.702	36.82	52.44	0.29	0.270	20.16	7.01
Q1-10 Flow												
12.230	4.60	0.00	4.60	.2321	0.00218	NA	NA	NA	0.23	0.344	20.24	7.01
Q30-10 Flow												
12.230	9.78	0.00	9.78	.2321	0.00218	NA	NA	NA	0.34	0.229	20.12	7.01

WQM 7.0 Effluent Limits

SWP Basin	Stream Code	Stream Name
03G	520	CHESTER CREEK

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)
12.230	Walnut Hill STP	PA0050237	0.150	CBOD5	15		
				NH3-N	5	10	
				Dissolved Oxygen			4

TRC

TRC_CALC

TRC EVALUATION

Input appropriate values in A3:A9 and D3:D9

7.2	= Q stream (cfs)	0.5	= CV Daily
0.15	= 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)
0	= % Factor of Safety (FOS)		=Decay Coefficient (K)

Source	Reference	AFC Calculations	Reference	CFC Calculations
TRC	1.3.2.iii	WLA afc = 9.917	1.3.2.iii	WLA cfc = 9.661
PENTOXSD TRG	5.1a	LTAMULT afc = 0.373	5.1c	LTAMULT cfc = 0.581
PENTOXSD TRG	5.1b	LTA_afc= 3.695	5.1d	LTA_cfc = 5.616

Source		Effluent Limit Calculations	
PENTOXSD TRG	5.1f	AML MULT = 1.231	
PENTOXSD TRG	5.1g	AVG MON LIMIT (mg/l) = 0.500	BAT/BPJ
		INST MAX LIMIT (mg/l) = 1.635	

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)