pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Northcentral Regional Office
CLEAN WATER PROGRAM

Application Type	**Renewal**	Application No.	**PA0041131**
Facility Type	**Non-Municipal**	APS ID	**1022754**
Major / Minor	**Minor**	Authorization ID	**1326161**

NPDES PERMIT FACT SHEET
INDIVIDUAL SEWAGE

Applicant and Facility Information

Applicant Name	**Columbia Montour Area Vocational Technical School (CMVT)**	Facility Name	**Columbia Montour Area Vocational Technical School WWTP**
Applicant Address	5050 Sweppenheiser Drive	Facility Address	5050 Sweppenheiser Drive
	Bloomsburg, PA 17815-8919		Bloomsburg, PA 17815-8920
Applicant Contact	Anthony Lylo (tlylo@cmvt.us)	Facility Contact	Anthony Lylo
Applicant Phone	(570) 784-8040	Facility Phone	(570) 784-8040
Client ID	6744	Site ID	442590
Ch 94 Load Status	Not Overloaded	Municipality	South Centre Township
Connection Status	No Limitations	County	Columbia
Date Application Received	September 3, 2020	EPA Waived?	Yes
Date Application Accepted	September 15, 2020	If No, Reason	

Purpose of Application: Renewal of an existing NPDES permit for the discharge of treated sewage.

Summary of Review

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		*Jonathan P. Peterman* Jonathan P. Peterman / Project Manager	February 2, 2021
X		*Nicholas W. Hartranft* Nicholas W. Hartranft, P.E. / Environmental Engineer Manager	February 3, 2021

Discharge, Receiving Waters and Water Supply Information			
Outfall No.	001	Design Flow (MGD)	0.015
Latitude	41° 1’ 43.40”	Longitude	76° 22’ 2.70”
Quad Name	Mifflinville	Quad Code	1035
Wastewater Description:	Sewage		
Receiving Waters	Unnamed Tributary to Susquehanna River (CWF)	Stream Code	28075
NHD Com ID	65639971	RMI	1.2
Drainage Area	0.52	Yield (cfs/mi^2)	0.33
Q_{7-10} Flow (cfs)	0.17	Q_{7-10} Basis	Gage No. 1468500
Elevation (ft)	520	Slope (ft/ft)	0.006
Watershed No.	5-D	Chapter 93 Class.	CWF
Existing Use	CWF	Existing Use Qualifier	N/A
Exceptions to Use	None.	Exceptions to Criteria	None.
Assessment Status	Attaining Use(s)		
Cause(s) of Impairment	N/A		
Source(s) of Impairment	N/A		
TMDL Status	N/A	Name	N/A
Nearest Downstream Public Water Supply Intake	Danville Municipal Water Authority		
PWS Waters	Susquehanna River	Flow at Intake (cfs)	1120
PWS RMI	138.06	Distance from Outfall (mi)	16.5

Changes Since Last Permit Issuance: The updated Q_{7-10} data was obtained from the updated stream gage information obtained from *Stuckey, M.H., and Roland, M.A., 2011, Selected Streamflow Statistics for Streamgage Locations In and Near Pennsylvania*. A comparative stream analysis was conducted using EcoFlows to determine a comparative stream gage (01468500) based on basin characteristics. The Q_{7-10} calculations, which are attached in Appendix A, indicate that the Q_{7-10} is 0.17 cfs.
Other Comments: None.

Treatment Facility Summary				
Treatment Facility Name: Columbia Montour Area Vocational Tech School				
WQM Permit No.	**Issuance Date**	**Comments:**		
1901403	2/7/2002	Initial Construction		
Waste Type	**Degree of Treatment**	**Process Type**	**Disinfection**	**Avg Annual Flow (MGD)**
Sewage	Secondary	Extended Aeration	Hypochlorite	0.015
Hydraulic Capacity (MGD)	**Organic Capacity (lbs/day)**	**Load Status**	**Biosolids Treatment**	**Biosolids Use/Disposal**
0.015	_----__	Not Overloaded	None	Other WWTP

Treatment System Components for Outfall 001:
- One (1) Communitor.
- One (1) Influent bar screen.
- One (1) Equalization tank.
- One (1) Distribution box
- One (1) Aeration tank.
- One (1) Clarifier.
- One (1) Erosion chlorinator.
- One (1) Chlorine contact tank.
- One (1) Parshall flume with flow meter.
- One (1) Polishing pond.
- One (1) Outfall 001.

- One (1) Aerated sludge holding tank.

Sludge use and disposal description and location(s): Other WWTP

Changes Since Last Permit Issuance: None.
Other Comments: None.

Anti-Backsliding

In accordance with 40 CFR 122.44(l)(1) and (2), this permit does not contain effluent limitations, standards, or conditions that are less stringent than the previous permit.

TMDL Impairment

The Department's Geographical Information System indicates that there are no associated TMDLs for the Unnamed Tributary to Susquehanna River. However, the causes for the designated use impairments in the Susquehanna River itself have been identified as organic Polychlorinated Biphenyls (PCBs). It is now illegal to manufacture, distribute, or use PCB in the United States. It is believed that the PCBs present in the Susquehanna River reside primarily in the sediment due to historic use. It can be determined that a facility of this type without any industrial users, would not be a source for PCBs. In accordance with 40 CFR §122.44(d)(1)(ii)&(iii), it can be determined that the effluent from this facility has no "Reasonable potential to cause, or contributes to an in-stream excursion above the allowable ambient concentration of a State numeric criteria within a State water quality standard for an individual pollutant." Therefore, the permit will not be required to contain effluent limits for PCB's. No further TMDL has been taken into consideration during this review.

Chesapeake Bay Requirements

Since this facility's annual average design flow is 0.015 MGD, the permittee will be required to monitor and report TN and TP throughout the permit term at a frequency no less than annually in accordance with the Phase II WIP Chesapeake Bay Strategy for Phase V facilities (0.002 MGD to 0.2 MGD) unless 1) the facility has already conducted at least two years of nutrient monitoring and 2) a summary of the monitoring results are included in the next permit's fact sheet. The previous permit contained the results from the Chesapeake Bay Monitoring requirements and removed the monitoring requirements. The summarized results for this monitoring are contained below and the full data set is contained on an attached sheet. Since the permittee conducted this monitoring in the previous permit term and the data is summarized in the fact sheet below, the conditions have been met and Chesapeake Bay monitoring will not be required.

Existing Effluent Limitations and Monitoring Requirements

Existing Limits – Outfall 001

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Annual Average	Total Annual	Minimum	Average Monthly		Instant. Maximum		
Flow (MGD)	Report Avg Mo	Report Daily Max	XXX	XXX	XXX	XXX	1/week	Measured
pH (S.U.)	XXX	XXX	6.0	XXX	XXX	9.0	5/week	Grab
Dissolved Oxygen	XXX	XXX	Report	XXX	XXX	XXX	5/week	Grab
Total Residual Chlorine	XXX	XXX	XXX	0.5	XXX	1.6	5/week	Grab
CBOD5	XXX	XXX	XXX	25	XXX	50	2/month	Grab
Total Suspended Solids	XXX	XXX	XXX	30	XXX	60	2/month	Grab
Fecal Coliform (CFU/100 ml) May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	XXX	1,000	2/month	Grab
Fecal Coliform (CFU/100 ml) Oct 1 - Apr 30	XXX	XXX	XXX	2,000 Geo Mean	XXX	10,000	2/month	Grab
Ammonia-Nitrogen May 1 - Oct 31	XXX	XXX	XXX	3	XXX	6	2/month	Grab
Ammonia-Nitrogen Nov 1 - Apr 30	XXX	XXX	XXX	5	XXX	10	2/month	Grab
Total Phosphorus	Report	Report	XXX	Report Annl Avg	XXX	XXX	1/year	Grab
Total Nitrogen	Report	Report	XXX	Report Annl Avg	XXX	XXX	1/year	Grab

*The existing effluent limits for Outfall 001 were based on a design flow of 0.015 MGD.

Development of Effluent Limitations

Outfall No. 001 **Design Flow (MGD)** 0.015
Latitude 41° 1' 43.40" **Longitude** 76° 22' 2.70"
Wastewater Description: Treated 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)

Water Quality-Based Limitations

To establish whether or not water-quality based effluent limitations (WQBELs) are required, the Department models in-stream conditions. In order to determine limitations for CBOD5, ammonia-N and dissolved oxygen, the Department utilizes the WQM 7.0 v1.0b model and in order to determine limitations for toxics, the Department utilizes the PENTOXSD v2.0d model.

WQM 7.0 for Windows, Version 1.0b, Wasteload Allocation Program for Dissolved Oxygen and Ammonia Nitrogen
The previous model was run using the latest information on Q7-10 stream flow, background water quality, average annual design flow, and other discharge characteristics. The existing technology based effluent limit for $CBOD_5$ (25 mg/l) was used as inputs for the modeling as well as the existing water-quality based effluent limit for NH3-N (3 mg/l). The DO minimum daily average criterion from §93.7 (5.0 mg/L for CWF) was used for the in-stream objective for the model. The summary of the output is as follows:

Parameter	Effluent Limit		
	30 Day Average	Maximum	Minimum
CBOD5	25	N/A	N/A
Ammonia-N	3	6	N/A
Dissolved Oxygen	N/A	N/A	3

The previous model did not recommend water-quality based effluent limitations with regards to CBOD5 and dissolved oxygen. Refer to the Appendix for the WQM 7.0 inputs and results. Additionally, the model indicated that the effluent limits for ammonia-nitrogen as shown above are still protective of water quality. These limits will remain.

Best Professional Judgment (BPJ) Limitations

See the Dissolved Oxygen section below.

Additional Considerations

None

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 the abovementioned 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) and/or BPJ.

Proposed Limits - 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
	Annual Average	Total Annual	Minimum	Average Monthly		Instant. Maximum		
Flow (MGD)	Report Avg Mo	Report Daily Max	XXX	XXX	XXX	XXX	1/week	Measured
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	0.5	XXX	1.6	1/day	Grab
CBOD5	XXX	XXX	XXX	25	XXX	50	2/month	Grab
Total Suspended Solids	XXX	XXX	XXX	30	XXX	60	2/month	Grab
Fecal Coliform (No./100 ml) May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	XXX	1,000	2/month	Grab
Fecal Coliform (No./100 ml) Oct 1 - Apr 30	XXX	XXX	XXX	2,000 Geo Mean	XXX	10,000	2/month	Grab
Ammonia-Nitrogen May 1 - Oct 31	XXX	XXX	XXX	3	XXX	6	2/month	Grab
Ammonia-Nitrogen Nov 1 - Apr 30	XXX	XXX	XXX	5	XXX	10	2/month	Grab

*The proposed effluent limits for Outfall 001 were based on a design flow of 0.015 MGD.

Effluent Limit Determination for Outfall 001

General Information

The associated mass-based limits (lbs/day) for all parameters were based on the formula: design flow (average annual) (MGD) x concentration limit (mg/L) at design flow x conversion factor (8.34). All effluent limits were then rounded down in accordance with the rounding rules established in the *Technical Guidance for the Development and Specification of Effluent Limitations (362-0400-001)*, Chapter 5 - Specifying Effluent Limitations in NPDES Permits. The existing monitoring frequencies and sample types for these parameters generally correspond with the *Technical Guidance for the Development and Specification of Effluent Limitations* (362-0400-001) Table 6-3 and will remain.

Flow

Reporting of the daily maximum flow is consistent with monitoring requirements for other treatment plants and will remain.

Carbonaceous Biochemical Oxygen Demand ($CBOD_5$)

The results of the WQM 7.0 model show that the previously applied secondary treatment standards (25 PA Code §92a.47 (a) (1&2)) for $CBOD_5$ are protective of water quality and will remain.

Total Suspended Solids (TSS)
The previously applied technology based secondary treatment standards (25 PA Code §92a.47 (a) (1&2)) for TSS will remain as well.

pH
CFR Title 40 §133.102(c) and 25 PA Code §95.2(1) provide the basis of effluent limitations for pH.

Total Residual Chlorine (TRC)
In accordance with 25 Pa. Code 92a.48(b)(2), a best available technology (BAT) value of 0.5 mg/l was used in lieu of the existing effluent limit (1.0 mg/L) in the TRC Spreadsheet. The attached TRC model indicates that the technology-based effluent limit of 0.5 mg/L (Average Monthly) and 1.56 mg/L (Instantaneous Maximum) are protective of water quality. The existing limits will remain

Fecal Coliforms
The existing fecal coliform limits with I-max limits were previously updated from the previous Chapter 92 code to correspond with what is specified in the updated 25 PA Code § 92a.47 (a)(4)&(5). The existing effluent limits will remain.

Ammonia-Nitrogen (NH3-N)
The results of the WQM 7.0 model show that the existing water quality-based effluent limits for ammonia-nitrogen are appropriate and will remain.

Dissolved Oxygen (DO)
25 PA Code §93.7 provides specific water quality criteria for DO and monitoring for this parameter will ensure that the facility is not creating or contributing to an in-stream excursion below these water quality standards. Additionally, the *Technical Guidance for the Development and Specification of Effluent Limitations* (362-0400-001) lists DO under the self-monitoring requirements for sewage discharges and monitoring of DO is consistent with other discharges of this size and type.

Monitoring Requirements for TRC, DO, and pH.
During the last review, the permittee provided comments in a letter dated December 30, 2015, which requested that the monitoring frequency for TRC, DO, and pH be 3/week at a maximum. Table 6-3, footnote (3) in the Technical Guidance for the Development and Specification of Effluent Limitations (362-0400-001) stipulates that these parameters should be monitored daily with the exception of holidays and weekends. However, a monitoring frequency of 1/day will now be established. The permittee may enter the no discharge code on days (holidays and weekends) when the facility is not discharging.

Compliance History

Summary of Inspections -The most recent Clean Water Program onsite inspections for this facility were a Compliance Evaluation Inspection on 2/4/2020. No operational issues were noted during this inspection.

WMS Query Summary - A WMS Query was run at *Reports - Violations & Enforcements – Open Violations for Client Report* to determine whether there are any unresolved violations associated with the client that will affect issuance of the permit (per CSL Section 609). This query revealed no open violations.

eDMRs Summary - Upon review of the eDMR's, the facility has generally been in compliance with the existing effluent limits.

Compliance History

DMR Data for Outfall 001 (from December 1, 2019 to November 30, 2020)

Parameter	NOV-20	OCT-20	SEP-20	AUG-20	JUL-20	JUN-20	MAY-20	APR-20	MAR-20	FEB-20	JAN-20	DEC-19
Flow (MGD) Average Monthly	0.00063	0.0013	0.0019	0.0007	0.0007	0.0002	0.0002	0.0002	0.0007	0.0013	0.001	0.0008
Flow (MGD) Daily Maximum	0.0016	0.0036	0.0043	0.0020	0.0034	0.0003	0.0003	0.0039	0.0026	0.0058	0.0023	0.0019
pH (S.U.) Minimum	6.3	6.3	6.3	6.4	6.9	6.6	6.9	6.3	6.0	6.3	6.1	6.1
pH (S.U.) Maximum	8.0	7.7	7.6	8.7	7.6	7.1	7.4	8.0	7.3	7.3	7.4	7.4
DO (mg/L) Minimum	4.7	4.93	2.67	4.3	2.12	1.21	1.8	5.8	2.7	2.4	3.4	1.8
TRC (mg/L) Average Monthly	0.3	0.3	0.4	0.4	0.4	0.2	0.4	0.4	0.3	0.3	0.3	0.4
TRC (mg/L) Instantaneous Maximum	0.8	0.6	0.9	0.9	0.9	0.8	0.8	0.9	0.9	0.6	0.8	0.9
CBOD5 (mg/L) Average Monthly	< 3	< 3	< 3	< 3	< 3	< 5	< 3	< 4	6	5	< 3	< 4
TSS (mg/L) Average Monthly	6	9	6	7	< 2	4	4	6	9	6	4	16
Fecal Coliform (CFU/100 ml) Geometric Mean	3	3	< 1	< 1	< 1	< 1	< 1	< 16	< 1	< 1	< 42	< 9
Fecal Coliform (CFU/100 ml) Instantaneous Maximum	8	10	< 1	< 1	< 1	2	< 1	260	< 1	< 1	1733	74
Total Nitrogen (lbs/day) Annual Average												< 1.8
Total Nitrogen (lbs/day) Total Annual												< 57.3
Total Nitrogen (mg/L) Annual Average												< 79.13

Ammonia (mg/L) Average Monthly	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.5	< 0.1	< 0.1	< 0.3	< 0.1	< 0.1	< 0.1
Total Phosphorus (lbs/day) Annual Average												0.1
Total Phosphorus (lbs/day) Total Annual												3.3
Total Phosphorus (mg/L) Annual Average												4.58

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:
☐	Other:

APPENDIX A

Q_{7-10} ANALYSIS AND STREAM DATA

Q_{7-10} Analysis

Facility:	CMVT	NPDES Permit No.:	PA0041131
Outfall:	001	RMI at Outfall:	1.2 Elev. 520

Reference Stream Gage Information	
Stream Name	Schuylkill River
Reference Gage	1468500
Station Name	Schuylkill River at Landingville, PA
Gage Drainage Area (sq. mi.)	133
Q_{7-10} at gage (cfs)	44.5
Yield Ratio (cfs/mi^2)	0.3346

Was Ecoflows Used?	Yes
Correlation From Ecoflows	0.911

Check Dilution Ratio		
Discharge at Outfall (wf) (mgd)	0.015	
	sf (cfs)	wf (cfs)
Dilution Ratio = sf/wf	0.1740	0.023208431
Dilution Ratio =	7.496627426 to 1	

Q_{7-10} at Outfall	
Drainage Area at site (sq. mi.)	0.52
Q_{7-10} at discharge site (cfs)	0.1740
Q_{7-10} at discharge site (mgd)	0.1124
Low Flow Yield Ratio of 0.1 cfs/mi^2 (For Approx. Comparison Only)	
Q_{7-10} at discharge site (cfs)	0.0520
Q_{7-10} at discharge site (mgd)	0.0336

Q_{7-10} at Downstream Reach #1	
Drainage Area at Reach (sq. mi.)	10600
RMI	0
Q_{7-10} at reach (cfs)	3546.6165
Q_{7-10} at reach (mgd)	2292.2380
	Elev. 480

Q_{7-10} at Downstream Reach #2	
Drainage Area at Reach (sq. mi.)	[Drainage Area @ Reach #2]
RMI	[RMI @ Reach #2]
Q_{7-10} at reach (cfs)	#VALUE!
Q_{7-10} at reach (mgd)	#VALUE!

Q_{7-10} at Downstream Reach #3	
Drainage Area at Reach (sq. mi.)	[Drainage Area @ Reach #3]
RMI	[RMI @ Reach #3]
Q_{7-10} at reach (cfs)	#VALUE!
Q_{7-10} at reach (mgd)	#VALUE!

Basin Characteristics Report at [Site / Reach]

Date: Tues Nov 17, 2015 8:23:17 AM GMT-5
NAD 1983 Latitude: 41.0287 (41 01 43)
NAD 1983 Longitude: -76.3676 (-76 22 04)

Label	Value
DRNAREA	0.52
STRMTOT	0.8
STRDEN	1.54
BSLOPD	6.2
CENTROIDX	137407.5
CENTROIDY	227216.9
OUTLETX	137245
OUTLETY	226525
LONG_OUT	-76.36771
BSLOPDRAW	6.37
FOREST	35
PRECIP	41
URBAN	8
GLACIATED	0
ROCKDEP	4.7
CARBON	7
STORAGE	0
ELEV	666.3
MAXTEMP	60
DRN	3.7
IMPNLCD01	1
LC01DEV	19
LC11IMP	1.69
LC11DEV	22.3

Basin Map at Outfall

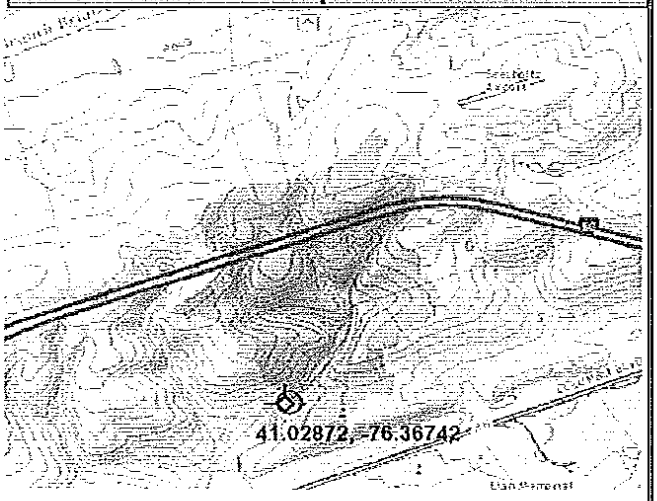


Table 2. Selected low-flow statistics for streamgage locations in and near Pennsylvania.—Continued

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

Streamgage number	Period of record used in analysis[1]	Number of years used in analysis	1-day, 10-year (ft³/s)	7-day, 10-year (ft³/s)	7-day, 2-year (ft³/s)	30-day, 10-year (ft³/s)	30-day, 2-year (ft³/s)	90-day, 10-year (ft³/s)
01453000	[3]1904–1927	18	237	312	447	378	546	472
01454700	1968–2005	38	471	510	745	600	902	760
01455500	1930–2008	52	0	.4	7.8	—	—	6.0
01457000	1905–2008	89	40.6	45.6	70.5	52.2	81.7	62.5
01459500	[2]1975–2008	34	1.9	2.1	4.1	2.9	7.1	5.7
01459500	[3]1937–1973	37	.4	.9	2.1	1.3	3.6	2.9
01463500	1914–2008	95	1,540	1,720	2,700	1,960	3,120	2,430
01463620	1974–2008	19	2.4	2.7	7.6	4.8	10.6	8.6
01464000	1925–2008	84	9.4	14.2	25.7	18.7	34.2	29.3
01464500	1942–2008	65	16.4	18.9	34.0	24.4	42.3	37.3
01464645	1987–2008	22	3.3	3.6	12.3	4.4	13.6	5.4
01464720	1992–2008	17	3.0	3.6	5.8	4.5	7.3	6.2
01465000	1886–1934	28	—	3.4	10.1	4.9	15.0	12.9
01465500	1936–2008	73	9.0	12.7	26.4	17.3	37.4	28.6
01465770	1966–1982	16	.3	.4	1.2	.8	1.7	1.7
01465798	1967–2008	42	1.0	1.2	3.6	3.0	6.8	7.9
01465850	1963–2008	19	5.2	8.5	13.2	12.1	19.5	17.1
01466500	1955–2008	54	.8	.8	1.1	.9	1.2	.9
01467000	1923–2008	86	26.2	34.2	51.8	41.6	63.2	53.2
01467042	1966–1981	16	8.6	9.3	16.8	11.3	21.5	17.0
01467048	1967–2008	42	10.7	12.1	18.9	16.6	27.2	26.6
01467050	1967–1981	15	.3	.4	.8	.7	1.3	1.6
01467081	1969–2008	38	2.4	2.9	4.1	3.9	6.0	6.3
01467086	1967–1988	23	3.3	4.4	6.9	6.6	9.9	10.4
01467087	1984–2008	25	1.6	2.1	6.1	4.8	10.1	12.0
01467089	1968–1982	15	4.8	6.6	9.6	10.3	16.0	20.1
01467150	1965–2008	44	3.9	5.4	10.1	7.3	13.2	11.5
01467500	1945–1969	25	14.6	17.2	24.5	19.8	28.5	23.4
01468500	1949–2008	40	40.8	44.5	70.6	52.1	82.4	65.0
01469500	1921–2008	88	4.8	5.5	10.9	7.3	14.4	10.1
01470500	1949–2008	60	69.2	82.3	137	102	164	133
01470756	1974–1995	22	14.8	16.7	30.5	23.4	43.9	35.5
01470779	1976–2008	33	21.9	24.6	39.3	29.4	45.2	34.8
01470853	1984–2005	22	.2	.4	1.2	.8	1.6	1.1
01470960	[2]1980–2008	29	29.4	31.8	52.4	47.0	74.7	66.3
01470960	[3]1967–1978	12	32.7	38.2	74.0	47.6	88.3	59.5
01471000	[2]1980–2008	29	36.9	43.4	69.4	58.9	93.9	81.0
01471000	[3]1952–1978	27	41.8	47.6	77.1	55.3	91.2	68.6
01471510	[2]1980–2008	29	222	244	347	274	422	340
01471510	[3]1916–1930	10	142	173	279	206	337	245
01471875	1995–2008	14	10.9	11.8	21.2	14.1	25.3	19.0
01471980	1976–2004	29	16.5	17.8	29.2	21.7	34.9	29.7
01472000	[2]1980–2008	29	276	301	432	349	527	453
01472000	[3]1929–1978	50	228	258	411	298	486	374
01472157	1970–2008	39	9.5	10.2	17.2	12.5	21.8	17.0

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

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

Streamgage number	Streamgage name	Latitude	Longitude	Drainage area (mi²)	Regulated[1]
01465780	Poquessing Creek above Byberry Creek at Phila., Pa.	40.070	-74.975	13.2	N
01465798	Poquessing Creek at Grant Ave. at Philadelphia, Pa.	40.057	-74.985	21.4	N
01465850	South Branch Rancocas Creek at Vincentown, N.J.	39.94	-74.763	64.5	N
01466500	McDonalds Branch in Byrne State Forest, N.J.	39.885	-74.505	2.35	N
01467000	North Branch Rancocas Creek at Pemberton, N.J.	39.97	-74.684	118	N
01467042	Pennypack Creek at Pine Road, at Philadelphia, Pa.	40.090	-75.069	37.9	N
01467048	Pennypack Creek at Lower Rhawn St Bdg, Phila., Pa.	40.050	-75.033	49.8	N
01467050	Wooden Bridge Run at Philadelphia, Pa.	40.055	-75.022	3.35	N
01467081	South Branch Pennsauken Creek at Cherry Hill, N.J.	39.942	-75.001	8.98	N
01467086	Tacony Creek ab Adams Avenue, Philadelphia, Pa.	40.047	-75.111	16.7	N
01467087	Frankford Creek at Castor Ave, Philadelphia, Pa.	40.016	-75.097	30.4	N
01467089	Frankford Creek at Torresdale Ave., Phila., Pa.	40.007	-75.092	33.8	N
01467150	Cooper River at Haddonfield, N.J.	39.903	-75.021	17.0	N
01467500	Schuylkill River at Pottsville, Pa.	40.684	-76.186	53.4	N
01468500	Schuylkill River at Landingville, Pa.	40.629	-76.125	133	N
01469500	Little Schuylkill River at Tamaqua, Pa.	40.807	-75.972	42.9	N
01470500	Schuylkill River at Berne, Pa.	40.523	-75.998	355	N
01470756	Maiden Creek at Virginville, Pa.	40.514	-75.883	159	N
01470779	Tulpehocken Creek near Bernville, Pa.	40.413	-76.172	66.5	N
01470853	Furnace Creek at Robesonia, Pa.	40.340	-76.143	4.18	N
01470960	Tulpehocken Creek at Blue Marsh Damsite near Reading, Pa.	40.371	-76.025	175	Y
01471000	Tulpehocken Creek near Reading, Pa.	40.369	-75.979	211	Y
01471510	Schuylkill River at Reading, Pa.	40.335	-75.936	880	Y
01471875	Manatawny Creek near Spangsville, Pa.	40.340	-75.742	56.9	N
01471980	Manatawny Creek near Pottstown, Pa.	40.273	-75.680	85.5	N
01472000	Schuylkill River at Pottstown, Pa.	40.242	-75.652	1,147	Y
01472157	French Creek near Phoenixville, Pa.	40.151	-75.601	59.1	N
01472174	Pickering Creek near Chester Springs, Pa.	40.090	-75.630	5.98	N
01472198	Perkiomen Creek at East Greenville, Pa.	40.394	-75.515	38.0	N
01472199	West Branch Perkiomen Creek at Hillegass, Pa.	40.374	-75.522	23.0	N
01472500	Perkiomen Creek near Frederick, Pa.	40.275	-75.455	152	N
01472620	East Branch Perkiomen Creek near Dublin, Pa.	40.404	-75.234	4.05	LF
01472810	East Branch Perkiomen Creek near Schwenksville, Pa.	40.259	-75.429	58.7	LF
01473000	Perkiomen Creek at Graterford, Pa.	40.230	-75.452	279	LF
01473120	Skippack Creek near Collegeville, Pa.	40.165	-75.433	53.7	N
01473169	Valley Creek at Pa. Turnpike Br near Valley Forge, Pa.	40.079	-75.461	20.8	N
01473500	Schuylkill River at Norristown, Pa.	40.111	-75.347	1,760	N
01473900	Wissahickon Creek at Fort Washington, Pa.	40.124	-75.220	40.8	N
01473950	Wissahickon Creek at Bells Mill Rd, Phila., Pa.	40.080	-75.226	53.6	N
01473980	Wissahickon Creek at Livezey Lane, Phila., Pa.	40.050	-75.214	59.2	N
01474000	Wissahickon Creek at Mouth, Philadelphia, Pa.	40.015	-75.207	64.0	N
01474500	Schuylkill River at Philadelphia, Pa.	39.968	-75.189	1,893	N
01475000	Mantua Creek at Pitman, N.J.	39.737	-75.113	6.05	N
01475300	Darby Creek at Waterloo Mills near Devon, Pa.	40.023	-75.422	5.15	N
01475510	Darby Creek near Darby, Pa.	39.929	-75.272	37.4	N

APPENDIX B

WQM 7.0 MODEL RESULTS

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
05D	28075	Trib 28075 to Susquehanna River	1.200	520.00	0.52	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	0.100	0.00	0.17	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
CMVT	PA0041131	0.0000	0.0150	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	3.00	0.00	0.00	0.70

WQM 7.0 Hydrodynamic Outputs

SWP Basin	Stream Code	Stream Name
05D	28075	Trib 28075 to Susquehanna 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												
1.200	0.17	0.00	0.17	.0232	0.00631	.398	4.93	12.41	0.10	0.744	20.60	7.00
Q1-10 Flow												
1.200	0.16	0.00	0.16	.0232	0.00631	NA	NA	NA	0.09	0.777	20.65	7.00
Q30-10 Flow												
1.200	0.20	0.00	0.20	.0232	0.00631	NA	NA	NA	0.11	0.689	20.52	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	0.916	Use Inputted Reach Travel Times	☐
Q30-10/Q7-10 Ratio	1.17	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
05D	28075	Trib 28075 to Susquehanna 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
1.200	CMVT	9.23	6	9.23	6	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
1.200	CMVT	1.85	3	1.85	3	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)		
1.20	CMVT	25	25	3	3	3	3	0	0

WQM 7.0 D.O.Simulation

SWP Basin	Stream Code	Stream Name
05D	28075	Trib 28075 to Susquehanna River

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
1.200	0.015	20.601	7.000
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
4.934	0.398	12.410	0.099
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
4.76	0.736	0.36	0.733
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
7.613	25.668	Owens	5
Reach Travel Time (days)			
0.744			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.074	4.50	0.34	8.15
0.149	4.26	0.32	8.15
0.223	4.02	0.31	8.15
0.298	3.80	0.29	8.15
0.372	3.59	0.27	8.15
0.447	3.40	0.26	8.15
0.521	3.21	0.25	8.15
0.596	3.04	0.23	8.15
0.670	2.87	0.22	8.15
0.744	2.71	0.21	8.15

WQM 7.0 Effluent Limits

SWP Basin	Stream Code	Stream Name
05D	28075	Trib 28075 to Susquehanna 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)
1.200	CMVT	PA0041131	0.000	CBOD5	25		
				NH3-N	3	6	
				Dissolved Oxygen			3

APPENDIX C

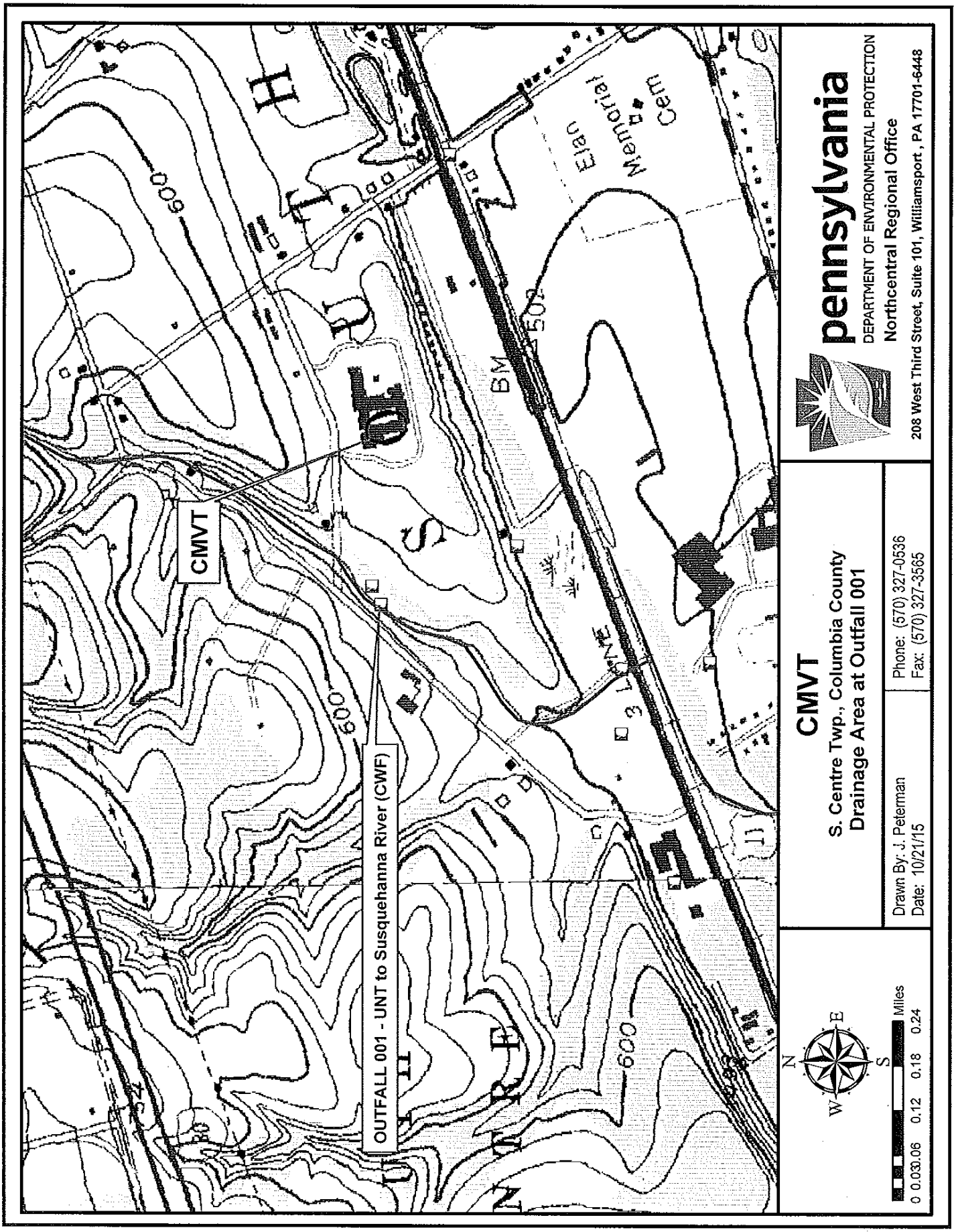
TRC ANALYSIS SPREADSHEET

1A	B	C	D	E	F	G
2	**TRC EVALUATION**	CMVT PA0041131				
3	Input appropriate values in B4:B8 and E4:E7					
4	0.17	= Q stream (cfs)		0.5	= CV Daily	
5	0.015	= Q discharge (MGD)		0.5	= CV Hourly	
6	20	= no. samples		1	= AFC_Partial Mix Factor	
7	0.3	= Chlorine Demand of Stream		1	= CFC_Partial Mix Factor	
8	0	= Chlorine Demand of Discharge		15	= AFC_Criteria Compliance Time (min)	
9	0.5	= BAT/BPJ Value		720	= CFC_Criteria Compliance Time (min)	
	0	= % Factor of Safety (FOS)		0	=Decay Coefficient (K)	
10	Source	Reference	AFC Calculations		Reference	CFC Calculations
11	TRC	1.3.2.iii	WLA afc = 2.356		1.3.2.iii	WLA cfc = 2.289
12	PENTOXSD TRG	5.1a	LTAMULT afc = 0.373		5.1c	LTAMULT cfc = 0.581
13	PENTOXSD TRG	5.1b	LTA_afc= 0.878		5.1d	LTA_cfc = 1.331
14						
15	Source		Effluent Limit Calculations			
16	PENTOXSD TRG	5.1f	AML MULT = 1.288			
17	PENTOXSD TRG	5.1g	AVG MON LIMIT (mg/l) = 0.500		BAT/BPJ	
18			INST MAX LIMIT (mg/l) = 1.563			

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)**

APPENDIX D

FACILITY MAP AND SCHEMATIC


CMVT
OUTFALL 001 - UNT to Susquehanna River (CWF)
600
BM 502
Elau Memorial Cem
CMVT
S. Centre Twp., Columbia County
Drainage Area at Outfall 001
Drawn By: J. Peterman
Date: 10/21/15
Phone: (570) 327-0536
Fax: (570) 327-3565
pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION
Northcentral Regional Office
208 West Third Street, Suite 101, Williamsport, PA 17701-6448
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