pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Southcentral Regional Office
CLEAN WATER PROGRAM

NPDES PERMIT FACT SHEET
INDIVIDUAL SEWAGE

Application Type	**Renewal**	Application No.	**PA0081795**
Facility Type	**Non-Municipal**	APS ID	**1082987**
Major / Minor	**Minor**	Authorization ID	**1430300**

Applicant and Facility Information

Applicant Name	**TKSM, LLC**	Facility Name	**Williams Grove MHP**
Applicant Address	1190 Wyndsong Drive	Facility Address	1550 Williams Grove Road
	York, PA 17403-4492		Mechanicsburg, PA 17055-5349
Applicant Contact	Kathy Rodas	Facility Contact	Richard Foust
Applicant Phone	(717) 873-2817	Facility Phone	(717) 873-2817
Client ID	244594	Site ID	237238
Ch 94 Load Status	Not Overloaded	Municipality	Monroe Township
Connection Status		County	Cumberland
Date Application Received	March 6, 2023	EPA Waived?	Yes
Date Application Accepted	March 19, 2023	If No, Reason	

Purpose of Application: NPDES permit renewal.

Summary of Review

Quality Water Resources, Inc., on behalf of the TKSM, LLC (Authority/Permittee), applied to the Pennsylvania Department of Environmental Protection (DEP) for issuance of the NPDES permit. The permit was last reissued on August 31, 2018 and became effective on September 1, 2018. The permit expired on August 31, 2023 but the terms and conditions have been administratively extended since that time.

The average annual design flow and hydraulic design capacity is 0.03 MGD.

The WQM Part II No. 2185425 was issued on 5/27/1986, and WQM No. 2185425 T-1 ownership transfer was issued on 12/19/2013.

Sludge use and disposal description and location(s): N/A because sludge is hauling by Smith's Septic.

Changes from the previous permit: The E. Coli. monitoring and report requirements will add to the proposed permit. The minimum D.O. limits changed to 7.0 mg/L for Jun 1 to Sept 30 & 8.0 mg/L for Oct 1 to May 30 in the proposed permit.

Based on the review outlined in this fact sheet, it is recommended that the permit be drafted. A public notice of the draft permit will be published in the *Pennsylvania Bulletin* for public comments for 30 days.

Approve	Deny	Signatures	Date
X		*Hilaryle* Hilary H. Le / Environmental Engineering Specialist	December 22, 2023 revised February 1, 2024
X		*Maria D. Bebenek for Daniel Martin* Daniel W. Martin, P.E. / Environmental Engineer Manager	February 9, 2024

Discharge, Receiving Waters and Water Supply Information			
Outfall No.	001	Design Flow (MGD)	0.03
Latitude	40º 8' 53.00"	Longitude	-77º 1' 43.00"
Quad Name	Mechanicsburg	Quad Code	1729
Wastewater Description:	Sewage Effluent		
Receiving Waters	Yellow Breeches Creek (CWF)	Stream Code	10121
NHD Com ID	56407191	RMI	21.65
Drainage Area	156 mi.^{2}	Yield (cfs/mi^2)	See comments below
Q_{7-10} Flow (cfs)	See comments below	Q_{7-10} Basis	See comments below
Elevation (ft)	415	Slope (ft/ft)	
Watershed No.	7-E	Chapter 93 Class.	CWF
Existing Use		Existing Use Qualifier	
Exceptions to Use		Exceptions to Criteria	
Assessment Status	See comments below		
Cause(s) of Impairment	See comments below		
Source(s) of Impairment	See comments below		
TMDL Status	N/A	Name	
Nearest Downstream Public Water Supply Intake	United Water Company		
PWS Waters	Yellow Breeches Creek	Flow at Intake (cfs)	
PWS RMI	7.42 miles	Distance from Outfall (mi)	Approximate 14.00 miles

Changes Since Last Permit Issuance:

Drainage Area
The discharge is to Yellow Breeches Creek at RMI 21.65. A drainage area upstream of the discharge is estimated to be 156 sq.mi. according to USGS PA StreamStats available at https://streamstats.usgs.gov/ss/.

Stream Flow
USGS gauging station No. 01571500 on Yellow Breeches Creek; the drainage area found to be 213 mi^2 and Q_{7-10} found to be 58.9 cfs; located 3.1 miles above mouth also measures the hatchery flow and springs at Huntsdale (PA0037141) which results in a greater yield rate in the basin than actually exists. The monthly hatchery discharge is estimated to be 12.384 MGD during low-flow periods of the year and the gauge flow should be adjusted by subtracting the hatchery discharge as follows:

Gauge flow = 58.9 cfs – (12.384*1.547) cfs = 39.74 cfs
Yield Low flow = 39.74 cfs / 213 sq.mi = 0.19 cfs/sq.mi.
Q_{7-10} = 156 sq.mi *0.19 cfs/sq.mi.= 29.6 cfs

Yellow Breeches Creek
Under 25 Pa Code §93.9o, Yellow Breeches Creek from LR 21012 (or SR 1007; Locust Point Road) to Mouth is designated as cold-water fishes. No existing uses have yet been identified for Yellow Breeches Creek. No special protection water is therefore impacted by the discharge. As of March 16, 2018, 25 Pa Code §93.9o requires DO_4 as an exception to specific criteria for Yellow Breeches Creek from LR 21012 to Mouth; however, a list of specific water quality criteria found in 25 Pa Code §93.7(a) does not contain DO_4. Therefore, no exceptions to criteria are applicable for this section of Yellow Breeches Creek. A brief conversation with a regional DEP biologist revealed that a modification of the exception to criteria for this section of Yellow Breeches Creek is currently reviewed by Environmental Hearing Board (EHB). This was also confirmed by the following *Pennsylvania Bulletin Vol. 47 No. 42* published dated October 21, 2017 with regard to EHB's proposed rulemaking based on a triennial review of water quality standards:

§ 93.9o. Drainage List O

…During the previous triennial review, the Board deleted DO_4 from the water quality standards. This standard applied to HQ-CWF streams. Since the criteria for HQ streams is based on the maintenance of existing water quality, the dissolved oxygen (DO) criterion for HQ-CWF streams was in contradiction to the expectation that existing quality will be protected and maintained for all HQ streams. Chapter 93 no longer contains a DO_4 criterion. However, this section contains one exception to the criteria that references DO_4, which is the Yellow Breeches Creek, main stem from LR 21012 to Mouth. ***The DO exception for the lower portion of the Yellow Breeches has appeared since at least 1968 to protect the world-renowned trout fishery that exists in this stream. The reference to DO_4 is proposed to be deleted and replaced with equivalent language (DO = 7.0 mg/L, June 1 to Sept. 30).*** *Since the DO_1 standard was also updated during the previous triennial review to a value more protective than 7.0 mg/L during October 1 to May 31, the more protective standard of DO_1 should be in place during that time period. Therefore, DO = 7.0 mg/L will only apply during the time period stipulated to ensure the maximum level of protection.*

Yellow Breeches Creek starting at RMI 22.38 is somehow split into two (2) segments; mainstem and a segment flows through the MHP. These segments then join together right after the point where the discharge occurs. The discharge is to the mainstem. According to the latest integrated water quality report, assessment unit IDs 11427 & 14319, showed that the discharge is located in a stream segment listed as attaining uses. However, the report also showed that the section of the segment flowing through the MHP is impaired for suspended solid and organic enrichment with low D.O. as a result of municipal point source. This impairment is possibly caused by same impairments identified for Dogwood Run which either runs into this segment or further downstream of Yellow Breeches Creek. Dogwood Run is a receiving water for Dillsburg WWTP. At this time, all permit requirements for Williams Grove MHP STP will be developed to ensure that the discharge from this facility will not additionally contribute to or cause the impairment.

The 2022 integrated water quality report, assessment unit IDs 11427 & 14319, showed that the discharge is located in a stream segment listed as attaining uses.

Potable Water Supply Intake

The nearest downstream public water supply intake is United Water Company located on the Yellow Breeches Creek, approximately 14 miles from the point of discharge. Considering distance, nature and dilution, the discharge is not expected to significantly impact the water supply.

Treatment Facility Summary

Treatment Facility Name: Williams Grove MHP

WQM Permit No.	Issuance Date
2185425	5/27/1986
2185425 T-1	12/19/2013

Waste Type	Degree of Treatment	Process Type	Disinfection	Avg Annual Flow (MGD)
Sewage	Secondary With Phosphorus Reduction	Extended Aeration	Hypochlorite	0.03

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

Changes Since Last Permit Issuance:

Other Comments:
The facility utilizes an extended aeration process which consists of aeration tanks (3), clarifiers (2), chlorine contact tank (1), and post aeration tank (1).

A sludge holding tank is available.

Chemical used:
Calcium hypochlorite tablets are used for disinfection. Alum and Soda Ash are used for pH adjustment as needed.

Biosolids:
The total sewage sludge/biosolids production within the facility for the previous year was 2.0 dry tons.

Industrial/Commercial Users:
There is no industrial or commercial contributor to the treatment plant.

Compliance History	
Summary of DMRs:	A summary of 12-month past DMR data is presented on the next page.
Summary of Inspections:	**4/23/2020:** Mr. Benham, DEP's environmental Program Compliance Specialist, conducted an administrative inspection. There were no violations identified during inspection. **11/12/2019**: Mr. Benham, DEP WQS, conducted a compliance evaluation inspection. The field test results were within permit limits. The effluent appeared clear. Recommendation was to install an effluent metering device that will be able to create a flow-proportional composite sample and accurate reporting of flow.
Other Comments:	There are currently one (1) open violation with SCRO Safe Drinking Water unit associated with the permittee or the facility. - 8/22/2023 – Safe Drinking Water – Failure to comply with uninterrupted system Service Plan requirements.

Other Comments:

Compliance History

DMR Data for Outfall 001 (from November 1, 2022 to October 31, 2023)

Parameter	OCT-23	SEP-23	AUG-23	JUL-23	JUN-23	MAY-23	APR-23	MAR-23	FEB-23	JAN-23	DEC-22	NOV-22
Flow (MGD) Average Monthly	0.0076	0.0077	0.0082	0.008	0.0082	0.0085	0.0083	0.0083	0.0096	0.0093	0.012	0.0093
Flow (MGD) Daily Maximum	0.0098	0.0102	0.0109	0.0138	0.0111	0.0121	0.0116	0.0115	0.0219	0.013	0.0302	0.0141
pH (S.U.) Daily Minimum	7.5	7.4	7.3	7.4	7.4	7.2	7.0	7.1	7.1	7.1	7.0	7.0
pH (S.U.) Daily Maximum	8.0	7.8	7.8	7.8	7.8	7.9	7.6	7.7	7.7	7.6	7.9	7.7
DO (mg/L) Daily Minimum	8.2	7.6	8.0	7.8	8.0	9.3	9.2	9.7	9.7	9.8	9.0	9.1
TRC (mg/L) Average Monthly	0.27	0.29	0.24	0.22	0.26	0.26	0.26	0.32	0.27	0.29	0.29	0.27
TRC (mg/L) Instantaneous Maximum	0.41	0.41	0.36	0.33	0.44	0.44	0.42	0.49	0.49	0.49	0.58	0.51
CBOD5 (mg/L) Average Monthly	< 2.0	< 2.0	< 2.0	< 3.7	< 2.0	< 2.2	< 2.0	< 3.0	< 2.0	< 3.0	< 2.1	< 2.0
TSS (mg/L) Average Monthly	< 7.0	< 8.0	7.0	< 5.0	< 5.0	< 5.0	< 5.0	6.0	< 5.0	< 5.0	9.0	5.0
Fecal Coliform (No./100 ml) Geometric Mean	< 1	< 1	< 1	< 1	< 4	< 1	< 1	< 1	< 1	< 1	< 2	< 1
Fecal Coliform (No./100 ml) Instantaneous Maximum	2	< 1	< 1	1	7	< 1	< 1	< 1	< 1	< 1	2	< 1
Nitrate-Nitrite (lbs/day) Daily Maximum		2.0473			1.2298			1.7027			0.686799	
Nitrate-Nitrite (mg/L) Daily Maximum		32.3			20.2			23.2			13.5	
Total Nitrogen (lbs/day) Daily Maximum		< 2.1107			< 1.2906			< 1.7761			< 0.737673	
Total Nitrogen (mg/L) Daily Maximum		< 33.3			< 21.2			< 24.2			< 14.5	
Ammonia (mg/L) Average Monthly	< 0.1	< 0.211	< 0.152	0.197	0.222	< 0.159	< 0.143	< 0.144	0.31	< 0.174	< 0.137	< 0.1

TKN (lbs/day) Daily Maximum		< 0.0634			< 0.0608			< 0.0734			< 0.050874	
TKN (mg/L) Daily Maximum		< 1.0			< 1.0			< 1.0			< 1.0	
Total Phosphorus (mg/L) Average Monthly	0.63	0.74	0.56	0.67	1.2	0.4	0.39	0.58	0.42	0.36	0.49	0.89

Development of Effluent Limitations

Outfall No. 001 **Design Flow (MGD)** 0.03
Latitude 40º 8' 53.00" **Longitude** -77º 1' 43.00"
Wastewater Description: Sewage Effluent

Technology-Based Limitations

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

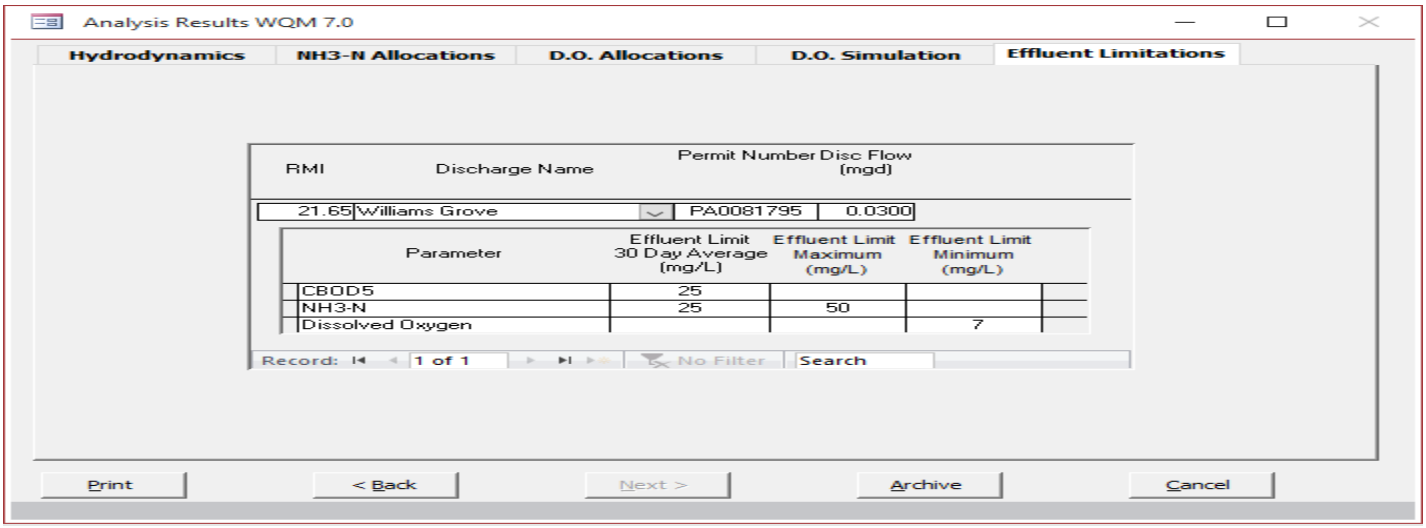
Pollutant	Limit (mg/l)	SBC	Federal Regulation	State Regulation
$CBOD_5$	25	Average Monthly	133.102(a)(4)(i)	92a.47(a)(1)
	40	Average Weekly	133.102(a)(4)(ii)	92a.47(a)(2)
Total Suspended Solids	30	Average Monthly	133.102(b)(1)	92a.47(a)(1)
	45	Average Weekly	133.102(b)(2)	92a.47(a)(2)
pH	6.0 – 9.0 S.U.	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)

Comments:

Water Quality-Based Limitations

Ammonia (NH_3-N):
NH_3N calculations are based on the Department's Implementation Guidance of Section 93.7 Ammonia Criteria, dated 11/4/97 (ID No. 391-2000-013). The following data is necessary to determine the in-stream NH_3-N criteria used in the attached WQM 7.0 computer model of the stream:

*	Discharge pH	=	7.0	(Default)
*	Discharge Temperature	=	20°C	(Default)
*	Stream pH	=	7.0	(Default)
*	Stream Temperature	=	20ºC	(Default)
*	Background NH_3-N	=	0 mg/L	(Default)



Regarding NH_3-N limits, the attached computer printout of the WQM 7.0 stream model (version 1.1) indicates that a limit of 25.0 mg/L as a monthly average and 50.0 mg/L instantaneous maximum (IMAX) are necessary to protect the aquatic life from toxicity effects at the point of discharge. However, DEP's SOP No. BPNPSM-PMT-033 recommends a monitoring requirement for NH_3-N if WQM modeling results indicates that an average monthly limit of 25.0 mg/L is acceptable. Therefore, a year-round monitoring requirement for NH_3-N will remain in the proposed permit.

Dissolved Oxygen (D.O.):
The D.O. goal is 6.0 mg/L. However, a minimum D.O. of 7.0 mg/L for June 1 to September 30 and 8.0 mg/L for Oct 1 to May 31 is required per 25 Pa. Code § 93.7. It is recommended that this limit be placed in the proposed permit to ensure the protection of water quality standards. Recent DMRs and inspection reports show that the facility has been consistently achieving these limits.

pH:
The effluent discharge pH should remain above 6.0 and below 9.0 standard units according to 25 Pa. Code § 95.2(1).

Carbonaceous Biochemical Oxygen Demand ($CBOD_5$):
The attached computer printout of the WQM 7.0 stream model (ver. 1.1) indicates that a monthly average limit of 25.0 mg/L, or secondary treatment, is adequate to protect the water quality of the stream. However, the existing permit 25.0 mg/L as AML & 50.0 mg/L as IMAX will remain in the proposed permit.

Fecal Coliform:
The recent coliform guidance in 25 Pa. Code § 92a.47.(a)(4) requires a summer technology limit of 200/100 ml as a geometric mean and an instantaneous maximum not greater than 1,000/100ml and § 92a.47.(a)(5) requires a winter limit of 2,000/100ml as a geometric mean and an instantaneous maximum not greater than 10,000/100ml.

E. Coli:
As recommended by DEP's SOP No. BCW-PMT-033, version 1.9 revised March 22, 2021, a routine monitoring for E. Coli will be included in the proposed permit under 25 Pa. Code § 92a.61. This requirement applies to all sewage dischargers greater than 0.002 MGD in their new and reissued permits. A monitoring frequency of 1/year will be included in the permit to be consistent with the recommendation from this SOP.

Total Residual Chlorine (TRC):
Since chlorine is used for disinfection and the current permit contains permit requirements for Total Residual Chlorine (TRC), DEP's TRC_CALC worksheet is utilized to determine if existing effluent limits of 0.5 mg/L (average monthly) and 1.6 mg/L (IMAX) are still adequate. The worksheet indicated that these existing effluent limits are still acceptable. No change is therefore recommended.

TRC EVALUATION

Input appropriate values in A3:A9 and D3:D9

29.6	= Q stream (cfs)	0.5	= CV Daily
0.03	= 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 =	203.475	1.3.2.iii	WLA cfc =	198.365
PENTOXSD TRG	5.1a	LTAMULT afc =	0.373	5.1c	LTAMULT cfc =	0.581
PENTOXSD TRG	5.1b	LTA_afc=	75.820	5.1d	LTA_cfc =	115.320

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)

Toxics
This is a minor sewage facility receiving domestic wastewater only and the current application does not require sampling of toxic pollutants (or heavy metals) for those facilities with design flows less than 0.1 MGD. Therefore, no reasonable potential analysis for toxic pollutants has been performed for this permit renewal.

Best Professional Judgment (BPJ) Limitations

Total Phosphorus (TP)
The discharge from this facility is currently required to meet effluent limits of 2.0 mg/L (average monthly) and 4.0 mg/L (IMAX). Based on previous fact sheets, it appears effluent limits were applied to protect the lower Susquehanna River even prior to the implementation of method specified in DEP's technical guidance to determine the need of effluent limits (i.e., <0.25% of the total loading). No specific rationales can be found to relax or remove this requirement. As a result, effluent limits will remain unchanged in the draft permit in accordance with 40 CFR §122.44(l)(1).

Additional Considerations

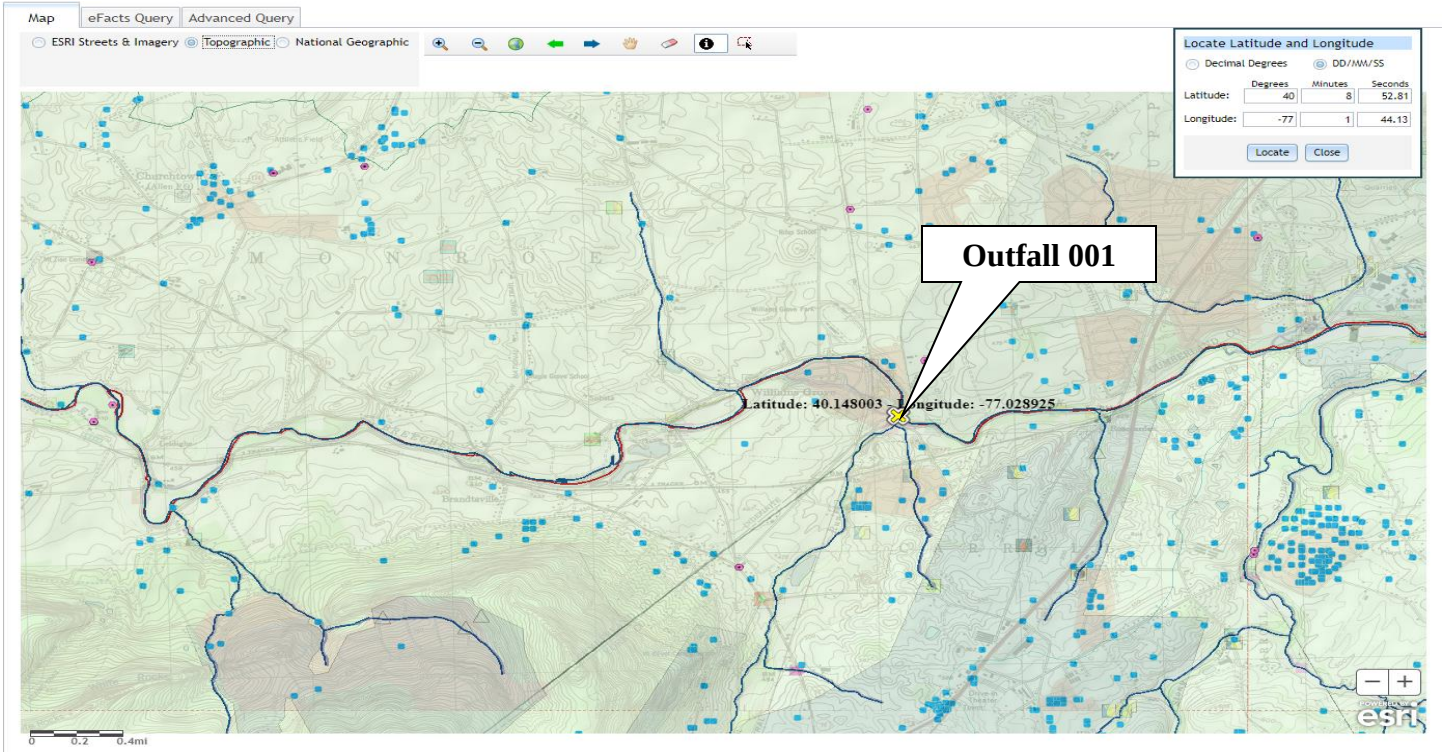
Flow Monitoring
The requirement to monitor the volume of effluent will remain in the draft permit per 40 CFR § 122.44(i)(1)(ii).

Chesapeake Bay Strategy
According to DEP's Chesapeake Bay Phase II Watershed Implementation Plan (WIP) Wastewater Supplement, this facility is considered a phase 5 non-significant sewage discharger with design flow less than 0.2 MGD but greater than 0.002 MGD. In general, DEP will issue permits for all phase 5 facilities with monitoring and reporting for Total Nitrogen (TN) and Total Phosphorus (TP) throughout the permit term at a frequency no less than annually. Since the facility is already assigned with a monthly TP monitoring requirement due to the above-referenced BPJ TP effluent limits, no additional requirement is necessary for TP. For TN, a quarterly monitoring requirement will be sufficient to generate ample data for the next permit renewal given the size of this facility. TN is a sum of Nitrate-Nitrite as N and TKN; therefore, quarterly 24-hr composite sampling of these pollutants will also be required.

Monitoring Frequencies and Sample Types
All minimum monitoring frequencies and sample types remain unchanged in the draft permit.

Anti-Degradation Requirements
All effluent limitations and monitoring requirements have been developed to ensure that existing instream water uses and the level of water quality necessary to protect the existing uses are maintained and protected.

Anti-Backsliding Requirements
Unless stated otherwise in this fact sheet, all permit requirements proposed in this fact sheet are at least as stringent as existing permit requirements in accordance with 40 CFR §122.44(l)(1).



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SELECT SCENARIOS

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Select available reports to display:

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Parameter Code	Parameter Description	Value	Unit
CARBON	Percentage of area of carbonate rock	35.85	percent
DRNAREA	Area that drains to a point on a stream	156	square miles
PRECIP	Mean Annual Precipitation	40	inches
ROCKDEP	Depth to rock	5.3	feet
STRDEN	Stream Density -- total length of streams divided by drainage area	1.11	miles per square mile

Low-Flow Statistics

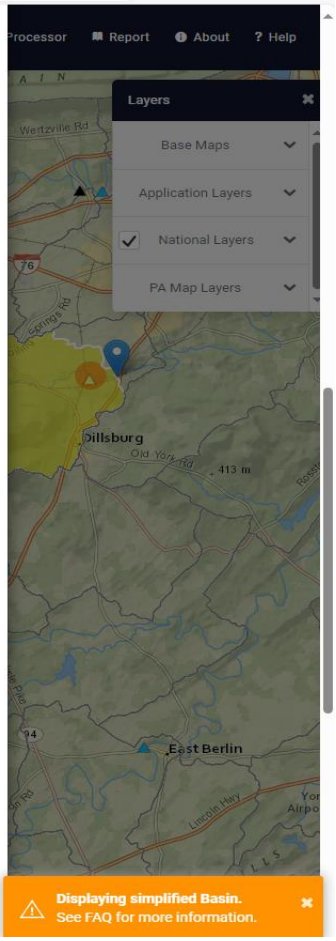
Low-Flow Statistics Parameters [100.0 Percent (156 square miles) Low Flow Region 2]

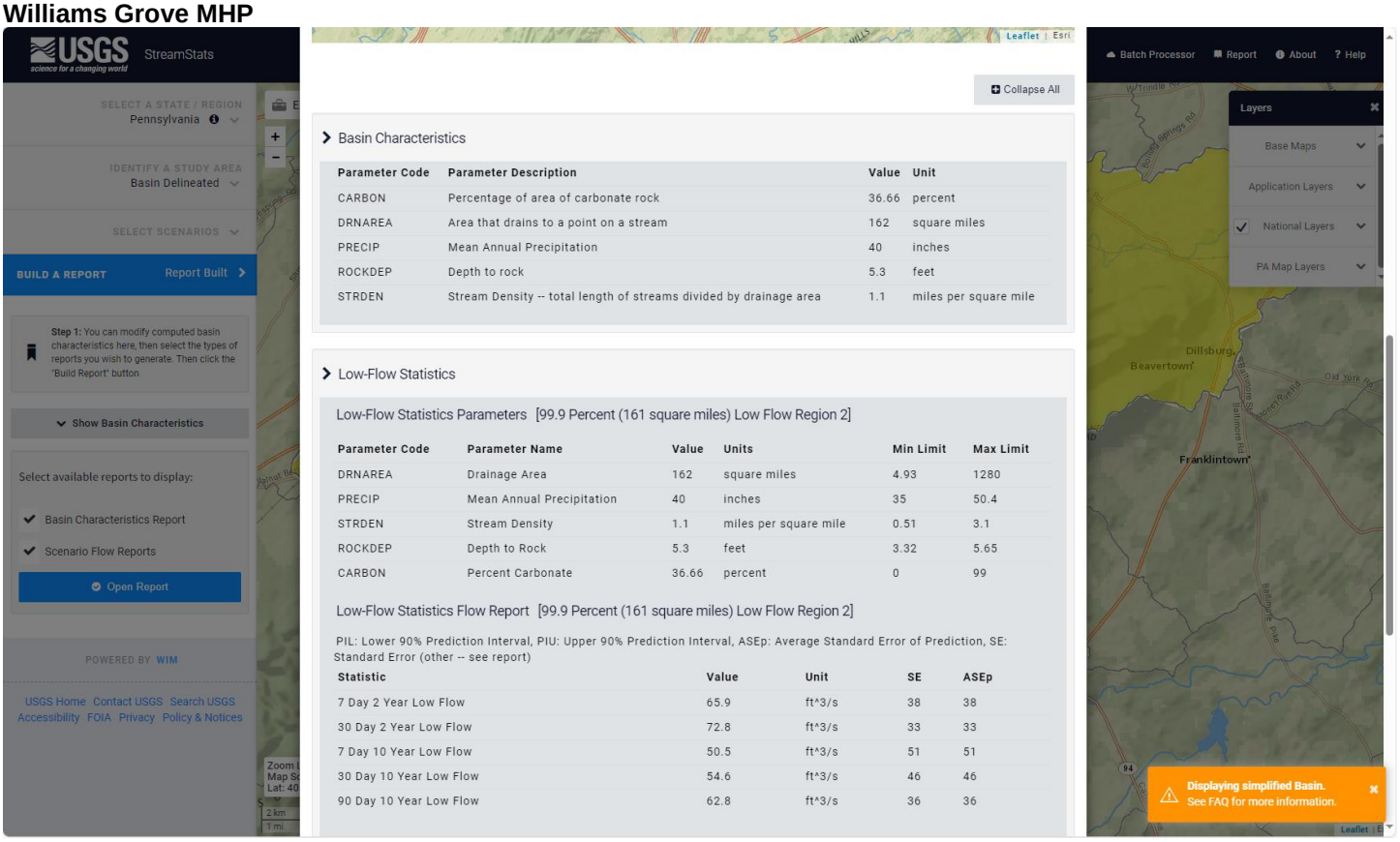
Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	156	square miles	4.93	1280
PRECIP	Mean Annual Precipitation	40	inches	35	50.4
STRDEN	Stream Density	1.11	miles per square mile	0.51	3.1
ROCKDEP	Depth to Rock	5.3	feet	3.32	5.65
CARBON	Percent Carbonate	35.85	percent	0	99

Low-Flow Statistics Flow Report [100.0 Percent (156 square miles) Low Flow Region 2]

PIL: Lower 90% Prediction Interval, PIU: Upper 90% Prediction Interval, ASEp: Average Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	SE	ASEp
7 Day 2 Year Low Flow	62.2	ft^3/s	38	38
30 Day 2 Year Low Flow	68.9	ft^3/s	33	33
7 Day 10 Year Low Flow	47.4	ft^3/s	51	51
30 Day 10 Year Low Flow	51.3	ft^3/s	46	46
90 Day 10 Year Low Flow	59.3	ft^3/s	36	36



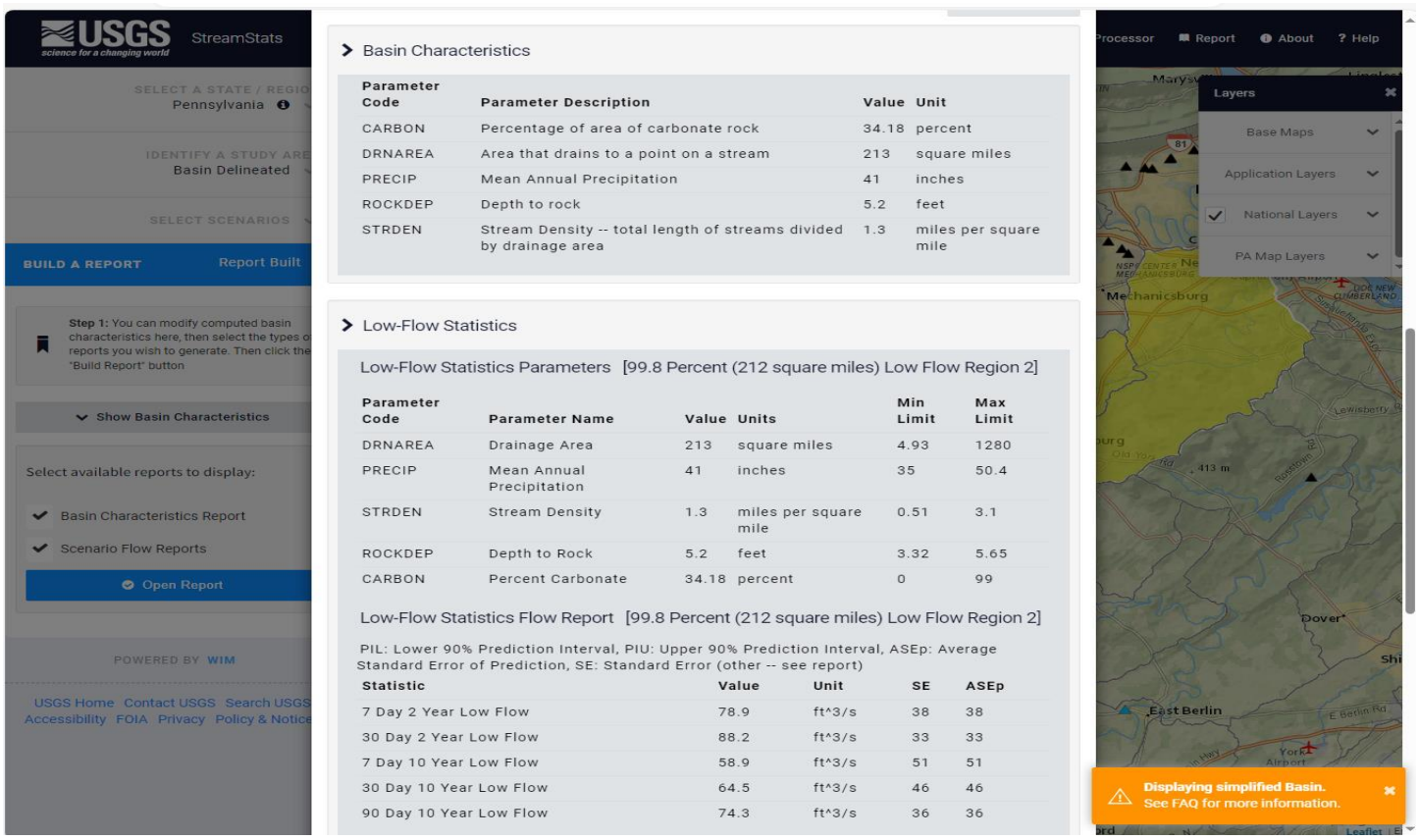


Parameter Code	Parameter Description	Value	Unit
CARBON	Percentage of area of carbonate rock	36.66	percent
DRNAREA	Area that drains to a point on a stream	162	square miles
PRECIP	Mean Annual Precipitation	40	inches
ROCKDEP	Depth to rock	5.3	feet
STRDEN	Stream Density -- total length of streams divided by drainage area	1.1	miles per square mile

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	162	square miles	4.93	1280
PRECIP	Mean Annual Precipitation	40	inches	35	50.4
STRDEN	Stream Density	1.1	miles per square mile	0.51	3.1
ROCKDEP	Depth to Rock	5.3	feet	3.32	5.65
CARBON	Percent Carbonate	36.66	percent	0	99

PIL: Lower 90% Prediction Interval, PIU: Upper 90% Prediction Interval, ASEp: Average Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	SE	ASEp
7 Day 2 Year Low Flow	65.9	ft^3/s	38	38
30 Day 2 Year Low Flow	72.8	ft^3/s	33	33
7 Day 10 Year Low Flow	50.5	ft^3/s	51	51
30 Day 10 Year Low Flow	54.6	ft^3/s	46	46
90 Day 10 Year Low Flow	62.8	ft^3/s	36	36



Parameter Code	Parameter Description	Value	Unit
CARBON	Percentage of area of carbonate rock	34.18	percent
DRNAREA	Area that drains to a point on a stream	213	square miles
PRECIP	Mean Annual Precipitation	41	inches
ROCKDEP	Depth to rock	5.2	feet
STRDEN	Stream Density -- total length of streams divided by drainage area	1.3	miles per square mile

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	213	square miles	4.93	1280
PRECIP	Mean Annual Precipitation	41	inches	35	50.4
STRDEN	Stream Density	1.3	miles per square mile	0.51	3.1
ROCKDEP	Depth to Rock	5.2	feet	3.32	5.65
CARBON	Percent Carbonate	34.18	percent	0	99

PIL: Lower 90% Prediction Interval, PIU: Upper 90% Prediction Interval, ASEp: Average Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	SE	ASEp
7 Day 2 Year Low Flow	78.9	ft^3/s	38	38
30 Day 2 Year Low Flow	88.2	ft^3/s	33	33
7 Day 10 Year Low Flow	58.9	ft^3/s	51	51
30 Day 10 Year Low Flow	64.5	ft^3/s	46	46
90 Day 10 Year Low Flow	74.3	ft^3/s	36	36

WQM 7.0:

The following data were used in the attached computer model (WQM 7.0) of the stream:

*	Discharge pH	7.0	(Default)
*	Discharge Temperature	20°C	(Default per 391-2000-013)
*	Stream pH	7.0	(Default per 391-2000-013)
*	Stream Temperature	20°C	(Default per 391-2000-013)

The following two nodes were used in modeling:

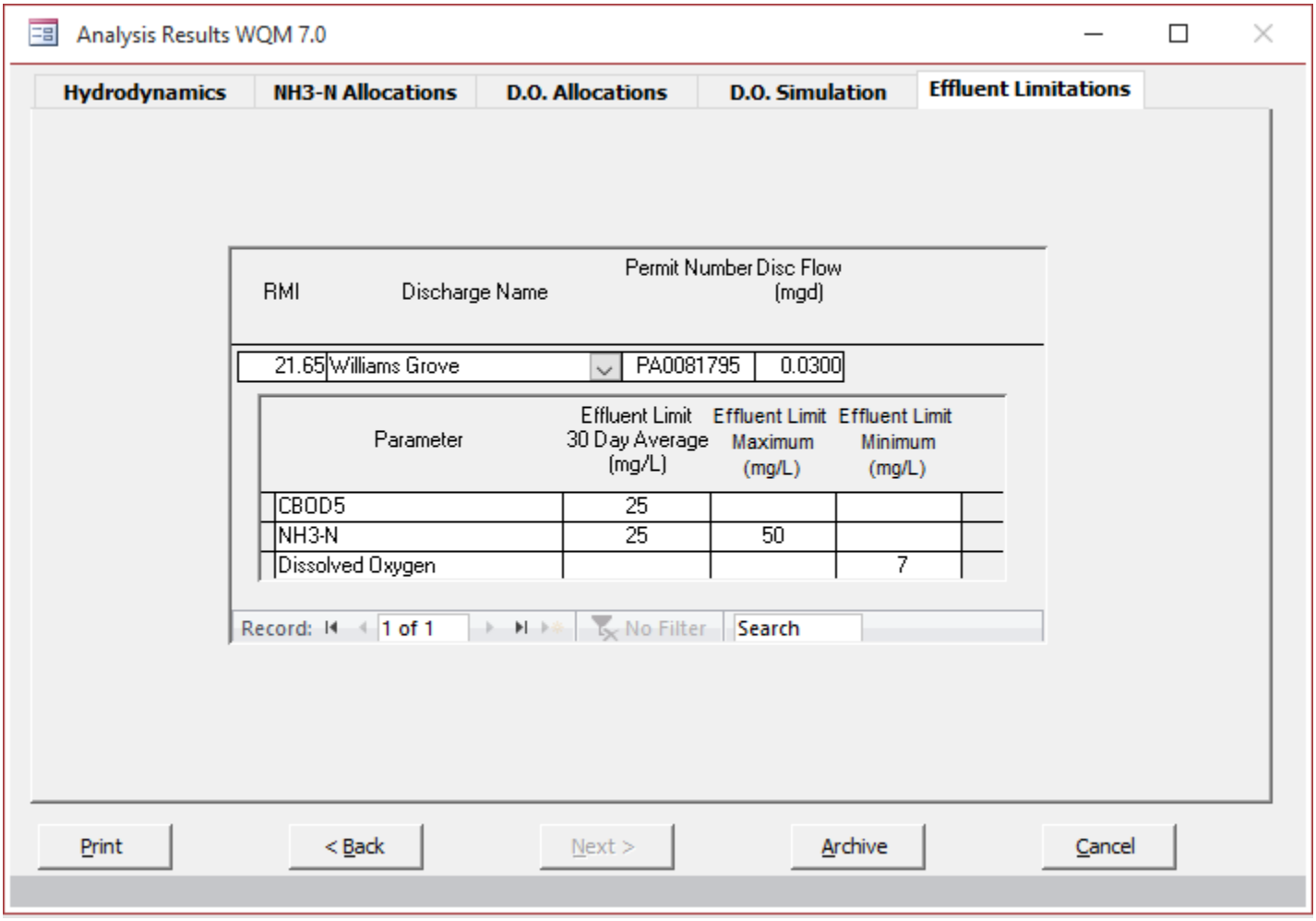
Node 1: Outfall 001 at Yellow Breeches Creek (10121)

Elevation:	415.00 ft (USGS National Map)
Drainage Area:	156 mi^2 (USGS StreamStats)
River Mile Index:	21.65 (PA DEP eMapPA)
Low Flow Yield:	0.19 cfs/mi^2
Discharge Flow:	0.03 MGD

Node 2: At the confluence with Stony Run (63124)

Elevation:	398.00 ft (USGS National Map)
Drainage Area:	162 mi^2 (USGS StreamStats)
River Mile Index:	20.10 (PA DEP eMapPA)
Low Flow Yield:	0.19 cfs/mi^2
Discharge Flow:	0.00 MGD

D.O minimum 7.0 mg/L for June 1 to September 30



D.O. minimum 8.0 mg/L for Oct 1 to May 31

Analysis Results WQM 7.0

Hydrodynamics | NH3-N Allocations | D.O. Allocations | D.O. Simulation | Effluent Limitations

RMI	Discharge Name	Permit Number	Disc Flow (mgd)
21.65	Williams Grove	PA0081795	0.0300

Parameter	Effluent Limit 30 Day Average (mg/L)	Effluent Limit Maximum (mg/L)	Effluent Limit Minimum (mg/L)
CBOD5	25		
NH3-N	25	50	
Dissolved Oxygen			8

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rptEffLimits

WQM 7.0 Effluent Limits

SWP Basin	Stream Code	Stream Name
07E	10121	YELLOW BREECHES CREEK

RMI	Name	Permit Number	Disc Flow (mgd)	Parameter	Eff. Limit 30-day Ave. (mg/L)	Eff. Limit Maximum (mg/L)	Eff. Limit Minimum (mg/L)
21.650	Williams Grove	PA0081795	0.030	CBOD5	25		
				NH3-N	25	50	
				Dissolved Oxygen			7

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rpt_WLA

WQM 7.0 Wasteload Allocations

SWP Basin	Stream Code	Stream Name
07E	10121	YELLOW BREECHES 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
21.650	Williams Grove	16.76	50	16.76	50	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
21.650	Williams Grove	1.89	25	1.89	25	0	0

Dissolved Oxygen Allocations

RMI	Discharge Name	CBOD5 Baseline (mg/L)	CBOD5 Multiple (mg/L)	NH3-N Baseline (mg/L)	NH3-N Multiple (mg/L)	Dissolved Oxygen Baseline (mg/L)	Dissolved Oxygen Multiple (mg/L)	Critical Reach	Percent Reduction
21.65	Williams Grove	25	25	25	25	7	7	0	0

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rptDOSim

WQM 7.0 D.O.Simulation

SWP Basin	Stream Code	Stream Name
07E	10121	YELLOW BREECHES CREEK

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
21.650	0.030	20.000	7.000
Reach Width (ft)	Reach Depth (ft)	Reach WD Ratio	Reach Velocity (fps)
78.412	0.852	88.942	0.429
Reach CBOD5 (mg/L)	Reach Kc (1/days)	Reach NH3-N (mg/L)	Reach Kn (1/days)
2.04	0.025	0.04	0.700
Reach DO (mg/L)	Reach Kr (1/days)	Kr Equation	Reach DO Goal (mg/L)
8.241	4.161	Tsivoglou	6
Reach Travel Time (days)			
0.221			

Subreach Results

Trav Time (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.022	2.03	0.04	8.24
0.044	2.03	0.04	8.24
0.066	2.03	0.04	8.24
0.088	2.03	0.04	8.24
0.110	2.03	0.04	8.24
0.132	2.03	0.04	8.24
0.154	2.03	0.04	8.24
0.176	2.03	0.03	8.24
0.199	2.03	0.03	8.24
0.221	2.02	0.03	8.24

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rptModelSpecs

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	0.84	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	6		

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rptHydro

WQM 7.0 Hydrodynamic Outputs

SWP Basin	Stream Code	Stream Name
07E	10121	YELLOW BREECHES 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												
21.650	29.84	0.00	29.84	.0464	0.00208	.882	78.41	88.94	0.43	0.221	20.00	7.00
Q1-10 Flow												
21.650	18.97	0.00	18.97	.0464	0.00208	NA	NA	NA	0.33	0.283	20.00	7.00
Q30-10 Flow												
21.650	40.31	0.00	40.31	.0464	0.00208	NA	NA	NA	0.51	0.188	20.00	7.00

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rptGeneral

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 F.C
07E	10121	YELLOW BREECHES CREEK	21.650	415.00	156.00	0.00000	0.00	☑

Stream Data

Design Cond.	LFY (cfsm)	Trib Flow (cfs)	Stream Flow (cfs)	Rch Trav Time (days)	Rch Velocity (fps)	WD Ratio	Rch Width (ft)	Rch Depth (ft)	Tributary Temp (°C)	Tributary pH	Stream Temp (°C)	Stream pH
Q7-10	0.190	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
Williams Grove	PA0081795	0.0300	0.0300	0.0300	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	7.00	8.24	0.00	0.00
NH3-N	25.00	0.00	0.00	0.70

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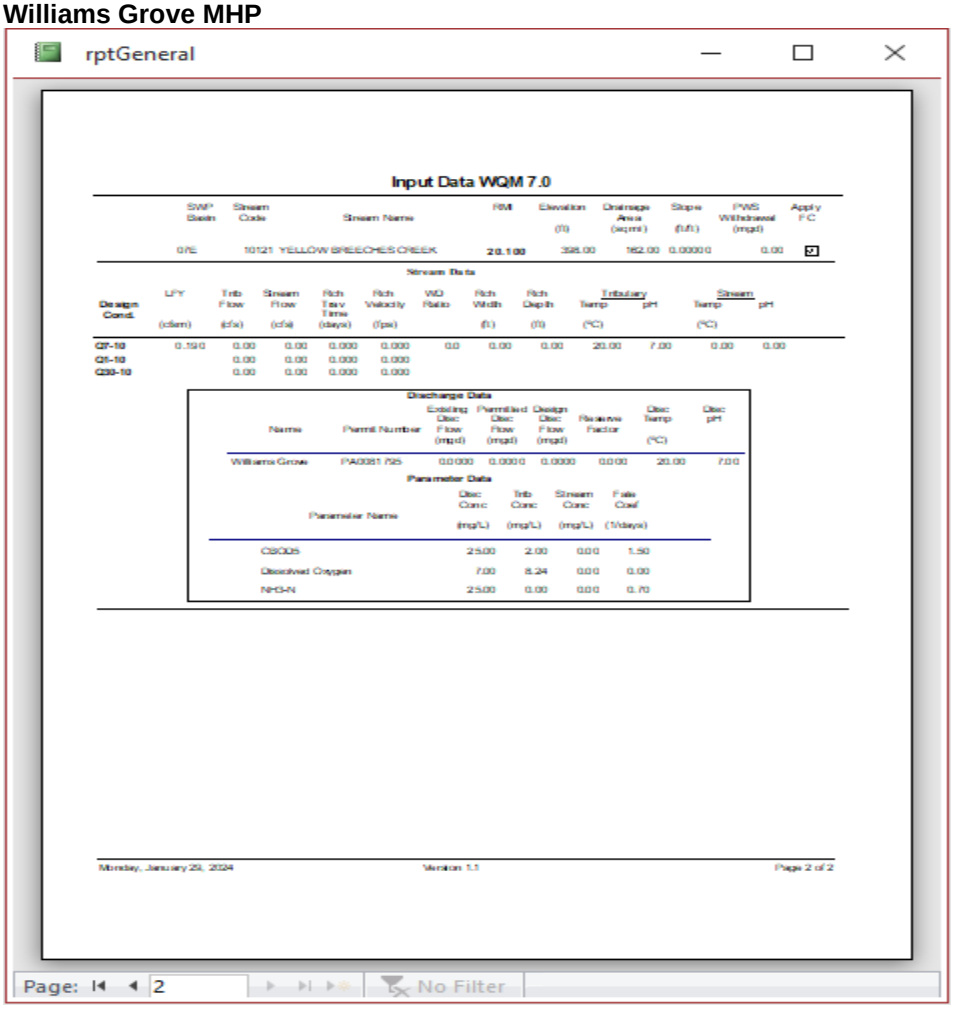
rptGeneral
Input Data WQM 7.0
Stream Data
Discharge Data
Parameter Data
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Existing Effluent Limitations and Monitoring Requirements

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly	Average Weekly	Minimum	Average Monthly	Maximum	Instant. Maximum		
Flow (MGD)	Report	Report Daily Max	XXX	XXX	XXX	XXX	Continuous	Measured
pH (S.U.)	XXX	XXX	6.0	XXX	9.0 Daily Max	XXX	1/day	Grab
DO	XXX	XXX	5.0	XXX	XXX	XXX	1/day	Grab
TRC	XXX	XXX	XXX	0.5	XXX	1.6	1/day	Grab
CBOD5	XXX	XXX	XXX	25.0	XXX	50	2/month	24-Hr Composite
TSS	XXX	XXX	XXX	30.0	XXX	60	2/month	24-Hr Composite
Fecal Coliform (No./100 ml) May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	XXX	1000	2/month	Grab
Fecal Coliform (No./100 ml) Oct 1 - Apr 30	XXX	XXX	XXX	2000 Geo Mean	XXX	10000	2/month	Grab
Ammonia	XXX	XXX	XXX	Report	XXX	XXX	2/month	24-Hr Composite
Total Phosphorus	XXX	XXX	XXX	2.0	XXX	4	2/month	24-Hr Composite
Nitrate-Nitrite	XXX	Report Daily Max	XXX	XXX	Report Daily Max	XXX	1/quarter	24-Hr Composite
Total Nitrogen	XXX	Report Daily Max	XXX	XXX	Report Daily Max	XXX	1/quarter	Calculation
TKN	XXX	Report Daily Max	XXX	XXX	Report Daily Max	XXX	1/quarter	24-Hr Composite

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	Measured
pH (S.U.)	XXX	XXX	6.0	XXX	9.0 Daily Max	XXX	1/day	Grab
D.O. Oct 1 - May 31	XXX	XXX	8.0	XXX	XXX	XXX	1/day	Grab
D.O. Jun 1 - Sep 30	XXX	XXX	7.0	XXX	XXX	XXX	1/day	Grab
TRC	XXX	XXX	XXX	0.5	XXX	1.6	1/day	Grab
$CBOD_5$	XXX	XXX	XXX	25.0	XXX	50.0	2/month	24-Hr Composite
TSS	XXX	XXX	XXX	30.0	XXX	60.0	2/month	24-Hr Composite
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
E. Coli (No./100 ml)	XXX	XXX	XXX	XXX	XXX	Report	1/year	Grab
Ammonia	XXX	XXX	XXX	Report	XXX	XXX	2/month	24-Hr Composite
Total Phosphorus	XXX	XXX	XXX	2.0	XXX	4.0	2/month	24-Hr Composite
Nitrate-Nitrite	XXX	Report Daily Max	XXX	XXX	Report Daily Max	XXX	1/quarter	24-Hr Composite
Total Nitrogen	XXX	Report Daily Max	XXX	XXX	Report Daily Max	XXX	1/quarter	Calculation
TKN	XXX	Report Daily Max	XXX	XXX	Report Daily Max	XXX	1/quarter	24-Hr Composite

Compliance Sampling Location:

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: