pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Southcentral Regional Office
CLEAN WATER PROGRAM

NPDES PERMIT FACT SHEET
INDIVIDUAL SEWAGE

Application Type	**Renewal**	Application No.	**PA0033111**
Facility Type	**Non-Municipal**	APS ID	**350308**
Major / Minor	**Minor**	Authorization ID	**1338458**

Applicant and Facility Information

Applicant Name	**Oak Creek Campgrounds Inc.**	Facility Name	**Oak Creek Campground**
Applicant Address	PO Box 128	Facility Address	400 East Maple Grove Road
	Bowmansville, PA 17507-0128		Narvon, PA 17555
Applicant Contact	Michael Schaden	Facility Contact	Michael Schaden
Applicant Phone	(717) 445-6161	Facility Phone	(717) 445-6161
Client ID	37367	Site ID	444146
Ch 94 Load Status	Not Overloaded	Municipality	Brecknock Township
Connection Status	No Limitations	County	Lancaster
Date Application Received	December 21, 2020	EPA Waived?	Yes
Date Application Accepted	January 12, 2021	If No, Reason	

Purpose of Application: NPDES permit Renewal.

Summary of Review

Oak Creek Campground, Inc. has applied to the Pennsylvania Department of Environmental Protection (DEP) for reissuance of its National Pollutant Discharge Elimination System (NPDES) permit for Oak Creek Campground STP. This permit renewal application was received on January 11, 2021. The permit was last reissued on August 30, 2016, authorizing discharge of treated sewage from the existing treatment plant located in Brecknock Township, Lancaster County into Rock Run. The permit expired on August 30, 2021 and was administratively extended since a timely application was submitted.

The permitted Annual Average Design Flow and Hydraulic Design Capacity is 0.00423 MGD. This plant discharges treated sewage to Rock Creek, a tributary to Conestoga Creek in Lower Susquehanna River basin. The camp site contains spaces for 300 camp sites with the owner living at the site year-round. Potable water is supplied by wells. Sodium Hypochlorite is the only chemical used in the plant.

The Oak Creek Campground has held a Water Quality Management permit since 1964 and an NPDES permit once that program was created.

Sludge use and disposal description and location(s): N/A

Changes from the previous permit: Unit of Fecal Coliform changed from CFU/100 ml to No./100 ml. The E. Coli. monitoring and report requirements will add to 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	November 12, 2021
X		*Maria D. Bebenek for* Daniel W. Martin, P.E. / Environmental Engineer Manager	November 30, 2021

Discharge, Receiving Waters and Water Supply Information			
Outfall No.	001	Design Flow (MGD)	0.00423
Latitude	40º 11' 58.96"	Longitude	-75º 59' 27.51"
Quad Name	Morgantown	Quad Code	
Wastewater Description:	Sewage Effluent		
Receiving Waters	Rock Run (HQ-TSF, MF)	Stream Code	07781
NHD Com ID	57461637	RMI	2.3
Drainage Area	6.59 mi.^{2}	Yield (cfs/mi^2)	0.1
Q_{7-10} Flow (cfs)	0.68	Q_{7-10} Basis	USGS StreamStats
Elevation (ft)	443	Slope (ft/ft)	
Watershed No.	7-J	Chapter 93 Class.	HQ-TSF, MF
Existing Use		Existing Use Qualifier	
Exceptions to Use		Exceptions to Criteria	
Assessment Status	Impaired		
Cause(s) of Impairment	Nutrient, Siltation		
Source(s) of Impairment	Grazing in Riparian or Shoreline Zones		
TMDL Status	Name		
Nearest Downstream Public Water Supply Intake	Lancaster Municipal Water Authority, Lancaster County		
PWS Waters	Conestoga River	Flow at Intake (cfs)	
PWS RMI	24.0 miles	Distance from Outfall (mi)	Approximate 30.0 miles

Changes Since Last Permit Issuance:

Drainage Area
The discharge is to Rock Run at RMI 2.3 miles. A drainage area upstream of the discharge is estimated to be 6.59 mi.^{2}, according to USGS PA StreamStats available at https://streamstats.usgs.gov/ss/.

Streamflow
According to StreamStats, the discharge point on Rock Run has a Q_{7-10} of 0.68 cfs and a drainage area of 6.59 mi.^{2}, which results in a Q_{7-10} low flow yield of 0.1 cfs/mi.^{2}. This information is used to obtain a chronic or 30-day (Q_{30-10}), and an acute or 1-day (Q_{1-10}) exposure stream flow for the discharge point as follows (Guidance No. 391-2000-023):

Q_{7-10} = 0.68 cfs
Low Flow Yield = 0.68 cfs / 6.59 mi.^{2} ≈ 0.1 cfs/mi.^{2}
Q_{30-10} = 1.36 * 0.68 cfs ≈ 0.92 cfs
Q_{1-10} = 0.64 * 0.68 cfs ≈ 0.44 cfs

The resulting Q_{7-10} dilution ratio is: Q_{stream} / $Q_{discharge}$ = 0.68 cfs / [0.00423 MGD * (1.55 cfs/MGD)] = 103.7:1

Public Water Supply
The nearest downstream public water supply intake is the Lancaster Municipal Authority, Lancaster County, approximately 30 miles downstream of this discharge. Considering distance and dilution, the discharge is not expected to impact the water supply.

Treatment Facility Summary				
Treatment Facility Name: Oak Creek Campground				
WQM Permit No.	**Issuance Date**			
Waste Type	**Degree of Treatment**	**Process Type**	**Disinfection**	**Avg Annual Flow (MGD)**
Sewage	Tertiary	Septic Tank Sand Filter W/Sol Removal	Hypochlorite	0.00423
Hydraulic Capacity (MGD)	**Organic Capacity (lbs/day)**	**Load Status**	**Biosolids Treatment**	**Biosolids Use/Disposal**
0.00423		Not Overloaded		Other WWTP

Changes Since Last Permit Issuance:

The wastewater follows the following treatment train:

Influent → septic tanks in series (16) → lift station → intermittent sand filters (2) → chlorine contact tank → discharge through 001

The chemical uses such as sodium Hypochlorite for disinfectant.

Compliance History	
Summary of DMRs:	The DMRs reported from October 1, 2020 to September 30, 2021 are summarized in the Table below (Pages # 4, & 5).
Summary of Inspections:	9/18/2018: Tracy Tomtishen & Kevin Buss, DEP Environmental Trainee & WQS, conducted a compliance evaluation inspection. There was a violation of sections 401 & 402 of The Clean Stream Law due to a discharge of chlorinated swimming pool water to Rock Creek. There were recommendations such as to provide an SOP outlining the end of season closing procedures for the facility's swimming pool & septic tank hauling records and flow meter calibration records to the Department within 30 days of receiving this report, post DEP 24-hour emergency Response Number at the facility and in SOP, and ensure the inspectors have access to any records that must be kept under the conditions of this permit on site.
Other Comments:	There are no open violations associated to the facility or the permittee.

Other Comments:

Compliance History

DMR Data for Outfall 001 (from October 1, 2020 to September 30, 2021)

Parameter	SEP-21	AUG-21	JUL-21	JUN-21	MAY-21	APR-21	MAR-21	FEB-21	JAN-21	DEC-20	NOV-20	OCT-20
Flow (MGD) Average Monthly	0.00154	0.00129	0.00092	0.00211	0.00209	0.00201	0.00213	0.0018	0.00174	0.00204	0.00138	0.00114
Flow (MGD) Daily Maximum	0.0031	0.00275	0.00175	0.00325	0.0038	0.004	0.0031	0.0024	0.0024	0.00325	0.0033	0.00225
pH (S.U.) Minimum	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8
pH (S.U.) Maximum	6.9	6.9	6.9	6.9	6.9	6.9	6.9	6.9	6.9	6.9	6.9	6.9
TRC (mg/L) Average Monthly	0.4	0.4	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
TRC (mg/L) Instantaneous Maximum	0.5	0.5	0.8	0.7	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
CBOD5 (mg/L) Average Monthly	15.1	6.6	7.0	6.3	41.9	< 2.4	2.5	< 3.2	< 3.0	5.5	6.0	< 6.0
CBOD5 (mg/L) Instantaneous Maximum	26.2	10.7	8.3	6.9	76.0	< 2.4	2.6	4.0	3.0	6.0	6.0	9.0
TSS (mg/L) Average Monthly	7.0	10.0	16.0	23.5	12.0	3.0	3.0	2.5	1.5	4.0	6.0	6.0
TSS (mg/L) Instantaneous Maximum	12.0	13.0	20.0	26.0	21.0	4.0	4.0	4.0	2.0	4.0	6.0	7.0
Fecal Coliform (No./100 ml) Geometric Mean	> 49	> 191	< 1.0	> 49	> 2420	> 689	923	1.4	7.7	38	> 49	> 98.4
Fecal Coliform (No./100 ml) Instantaneous Maximum	> 2420	> 2420	< 1.0	> 2420	> 2420	> 2420	1553	2.0	59	1414	> 2420	> 2420
Nitrate-Nitrite (mg/L) Average Quarterly	97.1			< 4.5			< 3.3			45.6		
Nitrate-Nitrite (lbs) Total Quarterly	74.5			6.32			5.57			15.75		
Total Nitrogen (mg/L) Average Quarterly	97.6			< 5.0			< 3.8			50.4		
Total Nitrogen (lbs) Total Quarterly	74.9			7.02			6.42			17.4		

Ammonia (mg/L) Average Monthly	18.3	18.1	< 1.2	7.1	12.7	< 0.165	< 0.10	< 0.10	< 0.1	1.08	16.0	15.5
Ammonia (mg/L) Average Quarterly	12.5			6.64			< 0.1			10.9		
Ammonia (lbs) Total Quarterly	11.03			12.45			0.144			6.9		
TKN (mg/L) Average Quarterly	< 0.5			< 0.5			< 0.50			4.8		
TKN (lbs) Total Quarterly	0.38			0.7			< 0.85			1.66		
Total Phosphorus (mg/L) Average Quarterly	7.3			0.55			0.6			7.2		
Total Phosphorus (lbs) Total Quarterly	5.6			0.77			1.0			2.5		

Development of Effluent Limitations

Outfall No. 001 **Design Flow (MGD)** 0.00423
Latitude 40º 11' 58.96" **Longitude** -75º 59' 27.51"
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

Carbonaceous Biochemical Oxygen Demand ($CBOD_5$):
The attached computer printout of the WQM 7.0 stream model (version 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 limits of 25.0 mg/L monthly average (AML), and 50.0 mg/L instantaneous maximum (IMAX) will remain in the proposed permit as per guidance document 391-2000-014. Recent DMRs and inspection reports show that the facility has been consistently achieving these limits. The minimum monitoring frequency will remain the same as 2/month which is also consistent with Permit Writers Manual Table 6-3.

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 IMAX are necessary to protect the aquatic life from toxicity effects at the point of discharge. The existing limits of 25.0 mg/L monthly average (AML), and 50.0 mg/L instantaneous maximum (IMAX). This is consistent with the existing permit. Recent DMRs and inspection reports show that the facility has been consistently achieving these limits. The minimum monitoring frequency will remain the same as 2/month.

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

Total Suspended Solids (TSS):
The existing technology-based limits of 30.0 mg/L average monthly, and 60.0 mg/L instantaneous maximum will remain in the proposed permit based on the minimum level of effluent quality attainable by secondary treatment based on 25 Pa. Code § 92a.47. Recent DMRs and inspection reports show that the facility has been consistently achieving these limits. The minimum monitoring frequency will remain the same as 2/month.

Dissolved Oxygen (D.O.):
A minimum D.O. of 5.0 mg/L is required per 25 Pa. Code § 93.7. However, since this facility is septic tank system and has been constructed in 1964 which eventually doesn't have external air injection system, the existing permit doesn't have D.O. requirement. The same will be retained in this renewal, however, if the permittee chose to expand the D.O. requirement will be considered.

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 1,000/100 ml and 25 Pa. Code § 92a.47.(a)(5) requires a winter limit of 2,000/100 ml as a geometric mean and an instantaneous maximum not greater than 10,000/100 ml.

E. Coli:
As recommended by DEP's SOP no. BPNPSM-PMT-033, 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 2/month will be included in the permit to be consistent with the recommendation from this SOP.

Total Residual Chlorine (TRC):
The attached computer printout utilizes the equations and calculations as presented in the Department's 2003 Implementation Guidance for Residual Chlorine (TRC) (ID # 391-2000-015) for developing chlorine limitations. The attached printout indicates that an average monthly water quality limit of 0.5 mg/L and IMAX of 1.6 mg/L would be needed to prevent toxicity concerns. The existing permit had an average monthly water limit of 0.5 mg/L and IMAX of 1.6 mg/L. This is consistent with the existing permit with the same monitoring frequency of 1/day. Recent DMR data indicates that the facility has been consistently achieving concentrations below these limits.

Chesapeake Bay Strategy:
The facility is categorized as a Phase 5 facility, a facility with a design flow greater than 0.002 MGD and less than 0.2 GMD. DEP's Phase II Watershed Implementation Plan (WIP) recommends monitoring of Total Nitrogen (TN) and Total Phosphorus (TP) for these Phase 5 facilities at a frequency no less than annually. DEP's SOP also recommends monitoring of TN and TP for any sewage facilities. However, the existing 1/quarter monitoring of TN species **(**Ammonia, Total Kjeldahl, and Nitrate-Nitrite-Nitrogen) and TP will remain in the proposed permit.

Total Phosphorus:
This facility is located in lower Susquehanna River basin which requires a local phosphorous evaluation. Phosphorus limitations are based on the Department's Implementation Guidance for Section 96.5 Phosphorus Discharges to Free-flowing Streams, dated 10/27/97 (ID No. 391-2000-018). Total phosphorus loading from this discharge would be 8.34 x 10 mg/l x 0.00423 MGD or 0.35 lbs/day. Using the equation that was documented in EPA's Chesapeake Bay Management Report, Total P @ Y = Total P x 0.99^{Y}, where Y = stream miles to PA-MD line, the actual loading to the critical part of the Susquehanna River would be 0.18 lbs/day at an estimated distance of 67.5 miles. This loading represents 0.18 lbs/day ÷ 3,814 lbs/day or 0.005% of the total phosphorus loading of all discharges in the Lower Susquehanna River Basin. According to the above phosphorus guidance, phosphorus removal will be required if this percentage is > 0.25%. Therefore, since 0.005 < 0.25%, phosphorus limitations will not be required.

Discharge to HQ water is also taken under consideration. Because of the HQ status, a SERA was prepared previously which resulted in a medium risk category that required a limitation of 2 mg/l. However, since the facility was constructed before the HQ designation, this limit will not be applied. This limit will be in effect in the event the facility chose to expand or upgrade.

Toxics:
A review of the application and inspection reports shows that there are no toxics of concern in the effluent. Therefore, no modeling is required.

Stormwater:
There is no stormwater outfall associated with this facility.

Antidegradation (93.4):
Chapter 93.4a(b) of the Department's rules and regulations require that "Existing instream water uses and the level of water quality necessary to protect the existing uses shall be maintained and protected." The discharge is into a segment of Rock Run which is classified as High Quality (HQ), Trout Stock Fishes (TSF) and Migratory Fishes (MF). The designation was imposed after the construction of the facility and discharge; therefore, it was included in the existing instream uses and water quality. If the facility plans to expand in future, the Antidegradation policy will be applied. No High Quality (HQ) stream will be impacted by this discharge. No Exceptional Value (EV) water will be impacted by this discharge.

303d Listed Streams:
The discharge is located in a stream segment that is designated Fish Consumption supporting but is Aquatic Life impaired due to nutrients and siltation by grazing in riparian or shoreline zones (September 24, 1998). The receiving stream is also impaired for recreational use due to pathogens from unknown source (October 16, 2015). Effluent limits were set up in the permit so that the discharge from this facility doesn't contribute to the impairment.

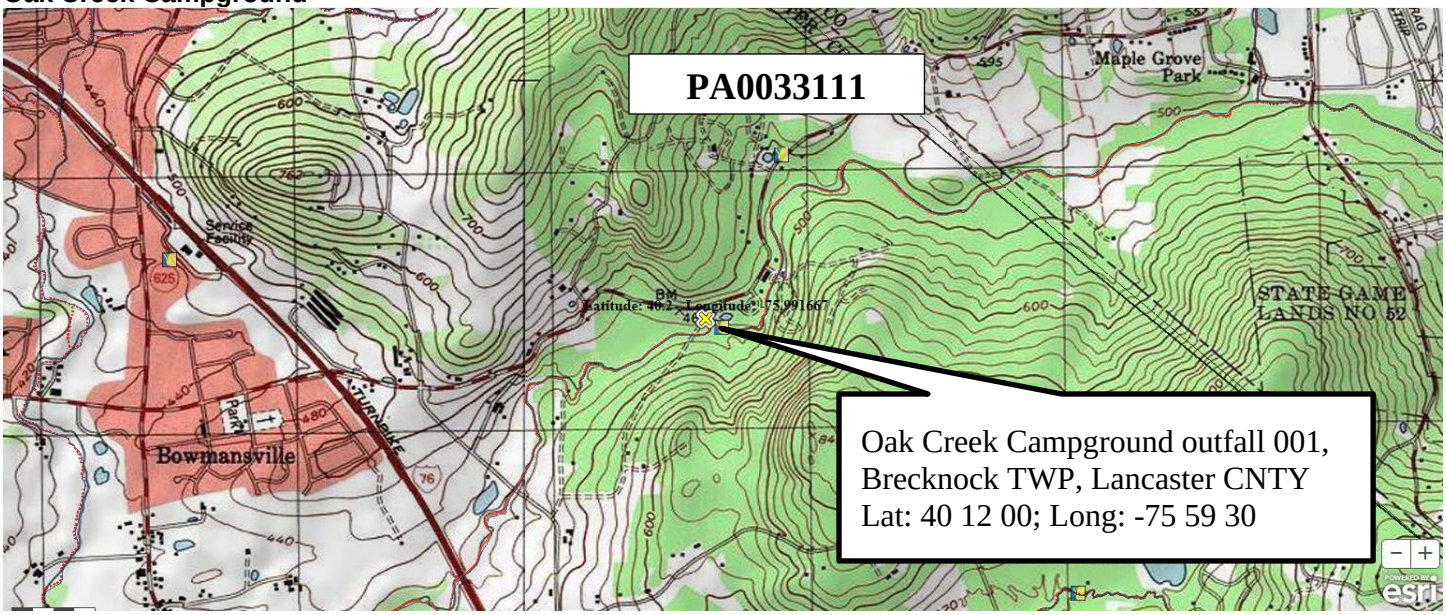
Class A Wild Trout Fisheries:
No Class A Wild Trout Fisheries are impacted by this discharge.

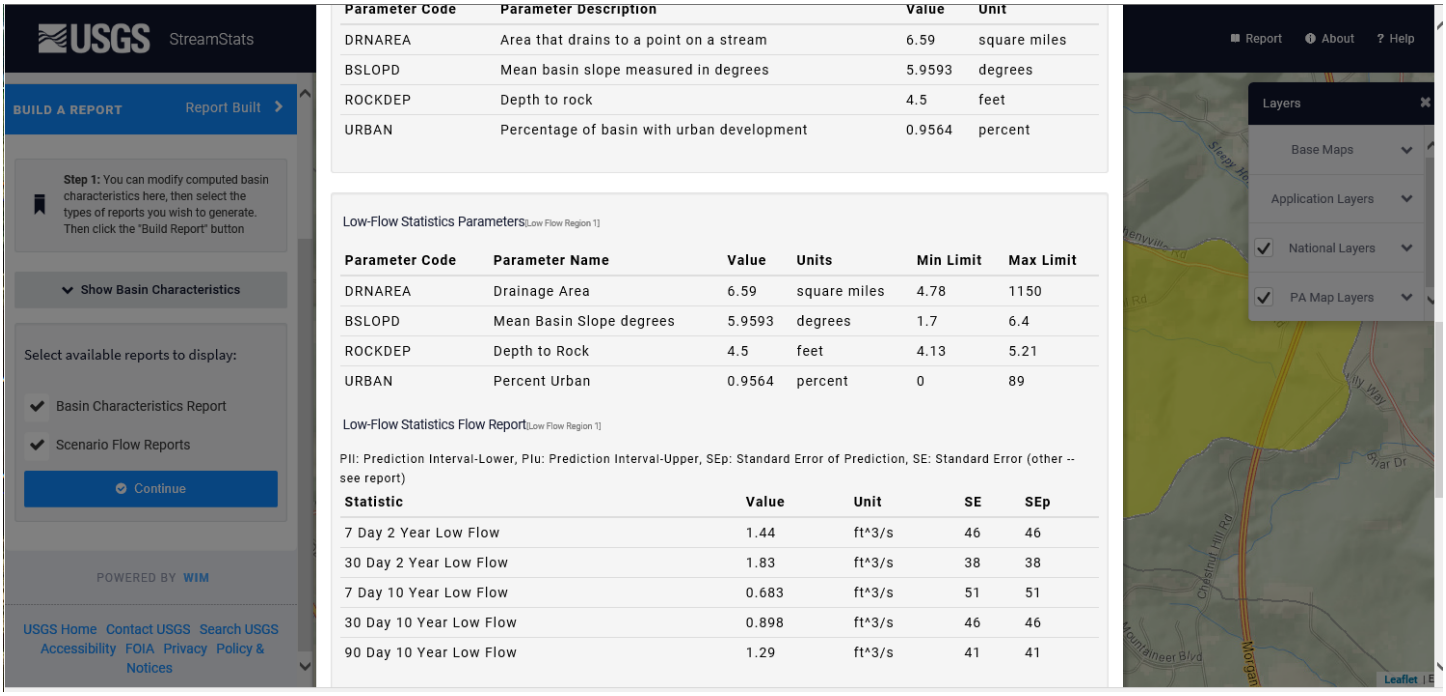
WQM 7.0:
The following data were used in the attached computer model (WQM 7.0) of the stream:

• Discharge pH	7.0	(Default)
• Discharge Temperature	20°C	(Default)
• Stream pH	7.0	(Default)
• Stream Temperature	20°C	(Default)

The following two nodes were used in modeling:

Node 1:	Outfall 001 at Rock Run (07781)	
	Elevation:	443 ft (USGS Topo Map)
	Drainage Area:	6.59 mi^2 (USGS StreamStats)
	River Mile Index:	2.3 (PA DEP eMapPA)
	Low Flow Yield:	0.1 cfs/mi^2
	Discharge Flow:	0.00423 MGD
Node 2:	Before the confluence with Muddy Creek (07760)	
	Elevation:	406 ft (USGS Topo Map)
	Drainage Area:	7.72 mi^2 (USGS StreamStats)
	River Mile Index:	0.001 (PA DEP eMapPA)
	Low Flow Yield:	0.1 cfs/mi^2
	Discharge Flow:	0.00 MGD





USGS StreamStats

BUILD A REPORT — Report Built

Step 1: You can modify computed basin characteristics here, then select the types of reports you wish to generate. Then click the "Build Report" button

Show Basin Characteristics

Select available reports to display:

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Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	6.59	square miles
BSLOPD	Mean basin slope measured in degrees	5.9593	degrees
ROCKDEP	Depth to rock	4.5	feet
URBAN	Percentage of basin with urban development	0.9564	percent

Low-Flow Statistics Parameters[Low Flow Region 1]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	6.59	square miles	4.78	1150
BSLOPD	Mean Basin Slope degrees	5.9593	degrees	1.7	6.4
ROCKDEP	Depth to Rock	4.5	feet	4.13	5.21
URBAN	Percent Urban	0.9564	percent	0	89

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

PII: Prediction Interval-Lower, PIu: Prediction Interval-Upper, SEp: Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	SE	SEp
7 Day 2 Year Low Flow	1.44	ft^3/s	46	46
30 Day 2 Year Low Flow	1.83	ft^3/s	38	38
7 Day 10 Year Low Flow	0.683	ft^3/s	51	51
30 Day 10 Year Low Flow	0.898	ft^3/s	46	46
90 Day 10 Year Low Flow	1.29	ft^3/s	41	41

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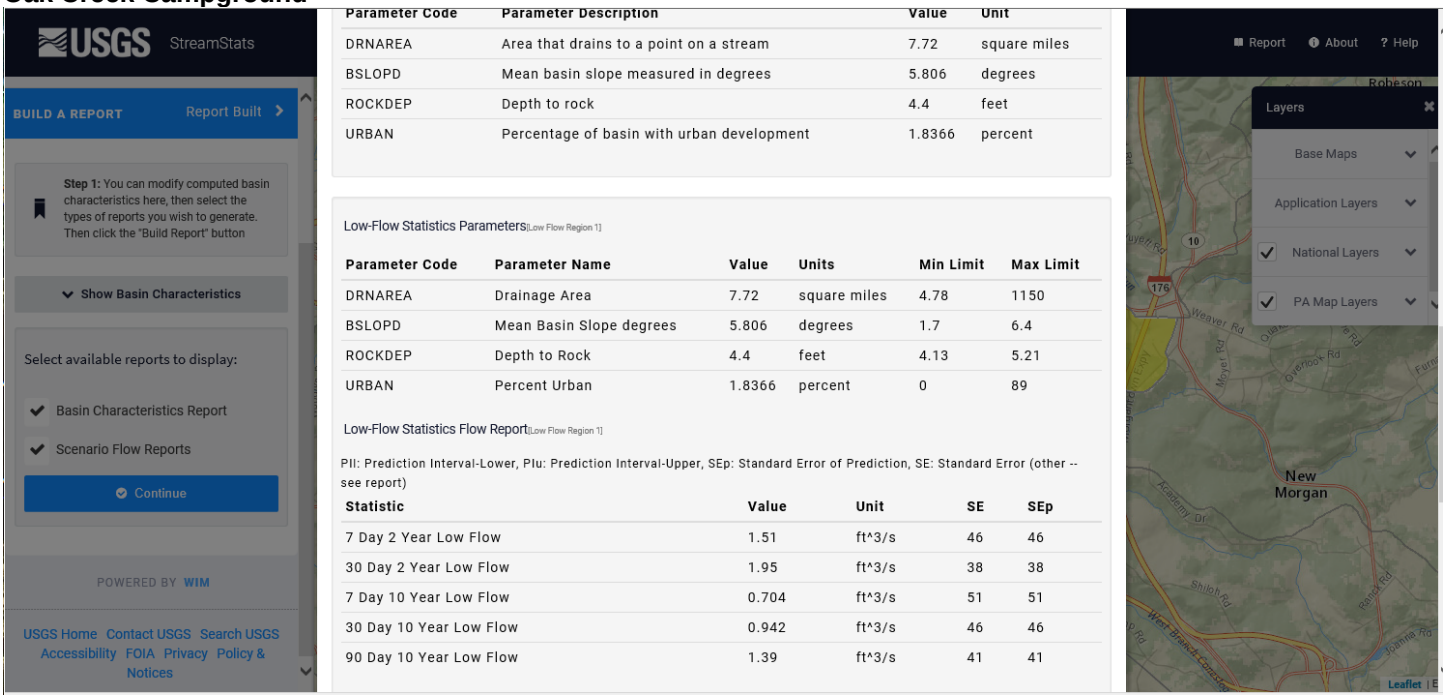
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Parameter Code Parameter Description Value Unit
DRNAREA Area that drains to a point on a stream 7.72 square miles
BSLOPD Mean basin slope measured in degrees 5.806 degrees
ROCKDEP Depth to rock 4.4 feet
URBAN Percentage of basin with urban development 1.8366 percent
Low-Flow Statistics Parameters
Parameter Code Parameter Name Value Units Min Limit Max Limit
DRNAREA Drainage Area 7.72 square miles 4.78 1150
BSLOPD Mean Basin Slope degrees 5.806 degrees 1.7 6.4
ROCKDEP Depth to Rock 4.4 feet 4.13 5.21
URBAN Percent Urban 1.8366 percent 0 89
Low-Flow Statistics Flow Report
PII: Prediction Interval-Lower, PIu: Prediction Interval-Upper, SEp: Standard Error of Prediction, SE: Standard Error (other -- see report)
Statistic Value Unit SE SEp
7 Day 2 Year Low Flow 1.51 ft^3/s 46 46
30 Day 2 Year Low Flow 1.95 ft^3/s 38 38
7 Day 10 Year Low Flow 0.704 ft^3/s 51 51
30 Day 10 Year Low Flow 0.942 ft^3/s 46 46
90 Day 10 Year Low Flow 1.39 ft^3/s 41 41
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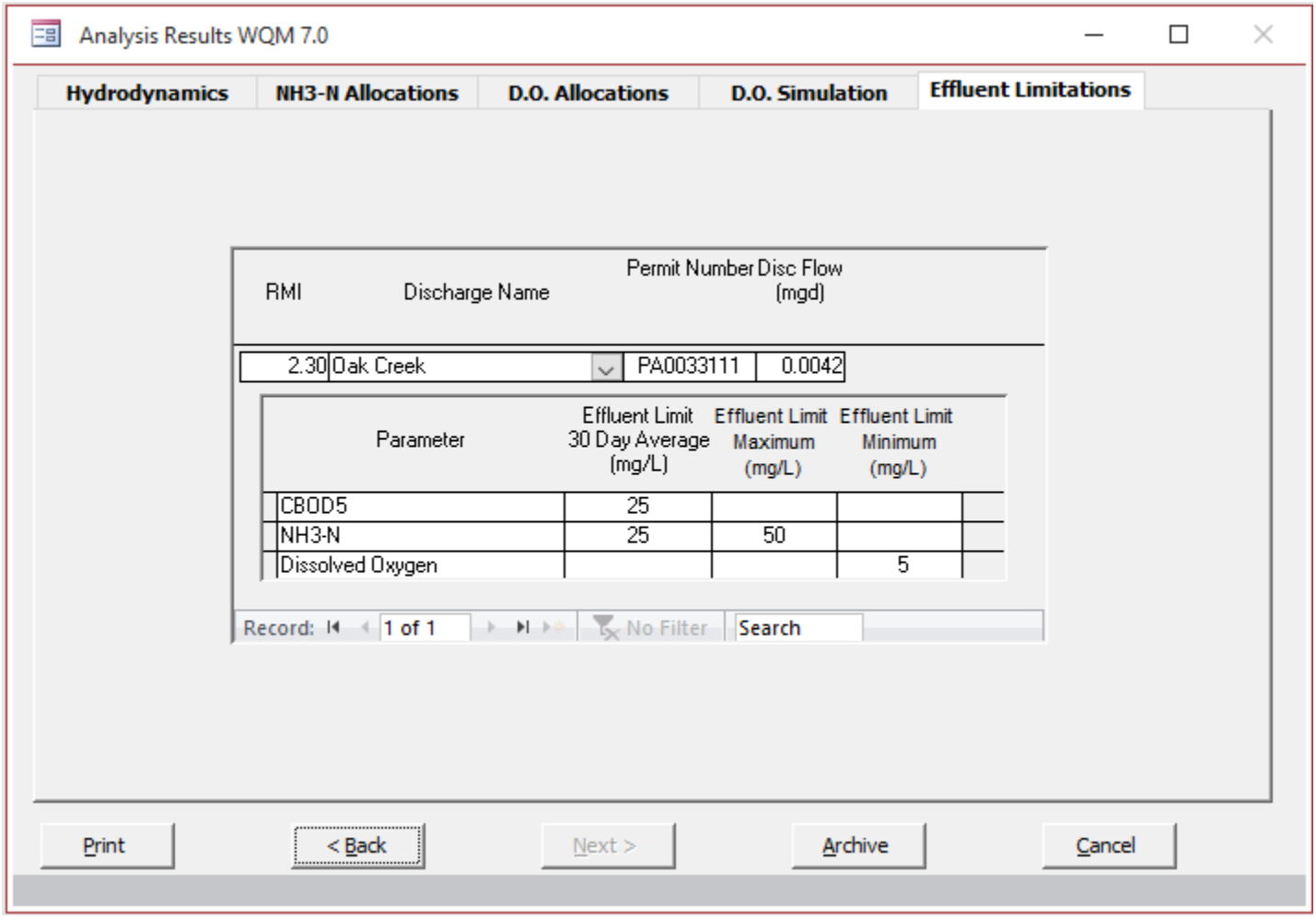
Analysis Results WQM 7.0
Hydrodynamics
NH3-N Allocations
D.O. Allocations
D.O. Simulation
Effluent Limitations
RMI
Discharge Name
Permit Number
Disc Flow (mgd)
2.30
Oak Creek
PA0033111
0.0042
Parameter
Effluent Limit 30 Day Average (mg/L)
Effluent Limit Maximum (mg/L)
Effluent Limit Minimum (mg/L)
CBOD5 25
NH3-N 25 50
Dissolved Oxygen 5
Record: 1 of 1
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rptEffLimits

WQM 7.0 Effluent Limits

SWP Basin	Stream Code	Stream Name
07J	7781	"ROCK RUN"

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)
2.300	Oak Creek	PA0033111	0.004	CBOD5	25		
				NH3-N	25	50	
				Dissolved Oxygen			5

Friday, November 12, 2021 Version 1.1 Page 1 of 1

Page: 1 No Filter

rpt_WLA

WQM 7.0 Wasteload Allocations

SWP Basin	Stream Code	Stream Name
07J	7781	"ROCK RUN"

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
2.300	Oak Creek	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
2.300	Oak Creek	1.89	25	1.89	25	0	0

Dissolved Oxygen Allocations

		CBOD5		NH3-N		Dissolved Oxygen			
RMI	Discharge Name	Baseline (mg/L)	Multiple (mg/L)	Baseline (mg/L)	Multiple (mg/L)	Baseline (mg/L)	Multiple (mg/L)	Critical Reach	Percent Reduction
2.30	Oak Creek	25	25	25	25	5	5	0	0

Friday, November 12, 2021 Version 1.1 Page 1 of 1

Page: 1 No Filter

rptDOSim

WQM 7.0 D.O. Simulation

SWP Basin	Stream Code	Stream Name
07J	7781	"ROCK RUN"

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
2.300	0.004	20.000	7.000
Reach Width (ft)	Reach Depth (ft)	Reach WDRatio	Reach Velocity (fps)
12.945	0.485	26.701	0.106
Reach CBOD5 (mg/L)	Reach Kc (1/days)	Reach NH3-N (mg/L)	Reach Kn (1/days)
2.22	0.675	0.34	0.700
Reach DO (mg/L)	Reach Kr (1/days)	Kr Equation	Reach DO Goal (mg/L)
8.211	18.411	Owens	6
Reach Travel Time (days)			
1.325			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	DO (mg/L)
0.133	2.20	0.22	8.24
0.265	2.18	0.20	8.24
0.398	2.16	0.18	8.24
0.530	2.14	0.17	8.24
0.663	2.12	0.15	8.24
0.795	2.10	0.14	8.24
0.928	2.07	0.13	8.24
1.060	2.05	0.12	8.24
1.193	2.03	0.11	8.24
1.325	2.01	0.10	8.24

Friday, November 12, 2021 Version 1.1 Page 1 of 1

Page: 1 No Filter

rptModelSpecs

WQM 7.0 Modeling Specifications

Parameters	Both	Use Inputted Q1-10 and Q30-10 Flows	☑
WLA Method	EMPR	Use Inputted WD Ratio	☐
Q1-10/Q7-10 Ratio	0.64	Use Inputted Reach Travel Times	☐
Q30-10/Q7-10 Ratio	1.36	Temperature Adjust Kr	☑
D.O. Saturation	90.00%	Use Balanced Technology	☑
D.O. Goal	6		

Friday, November 12, 2021 Version 1.1 Page 1 of 1

Page: 1 No Filter

rptHydro

WQM 7.0 Hydrodynamic Outputs

SWP Basin	Stream Code	Stream Name
07J	7781	"ROCK RUN"

RMI	Stream Flow (cfs)	PWS With (cfs)	Nat Stream Flow (cfs)	Disc Analysis Flow (cfs)	Reach Slope (ft/ft)	Depth (ft)	Width (ft)	WD Ratio	Velocity (fps)	Reach Trav Time (days)	Analysis Temp (°C)	Analysis pH
Q7-10 Flow												
2.300	0.66	0.00	0.66	.0065	0.00305	.485	12.95	26.7	0.11	1.325	20.00	7.00
Q1-10 Flow												
2.300	0.42	0.00	0.42	.0065	0.00305	NA	NA	NA	0.08	1.696	20.00	7.00
Q30-10 Flow												
2.300	0.90	0.00	0.90	.0065	0.00305	NA	NA	NA	0.13	1.117	20.00	7.00

Friday, November 12, 2021 Version 1.1 Page 1 of 1

Page: 1 No Filter

rptGeneral

Input Data WQM7.0

SWP Basin	Stream Code	Stream Name	RMI	Elevation (ft)	Drainage Area (sq mi)	Slope (ft/ft)	PWS Withdrawal (mgd)	Apply FC
07J	7781	"ROCK RUN"	2.300	443.00	6.59	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	0.00	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

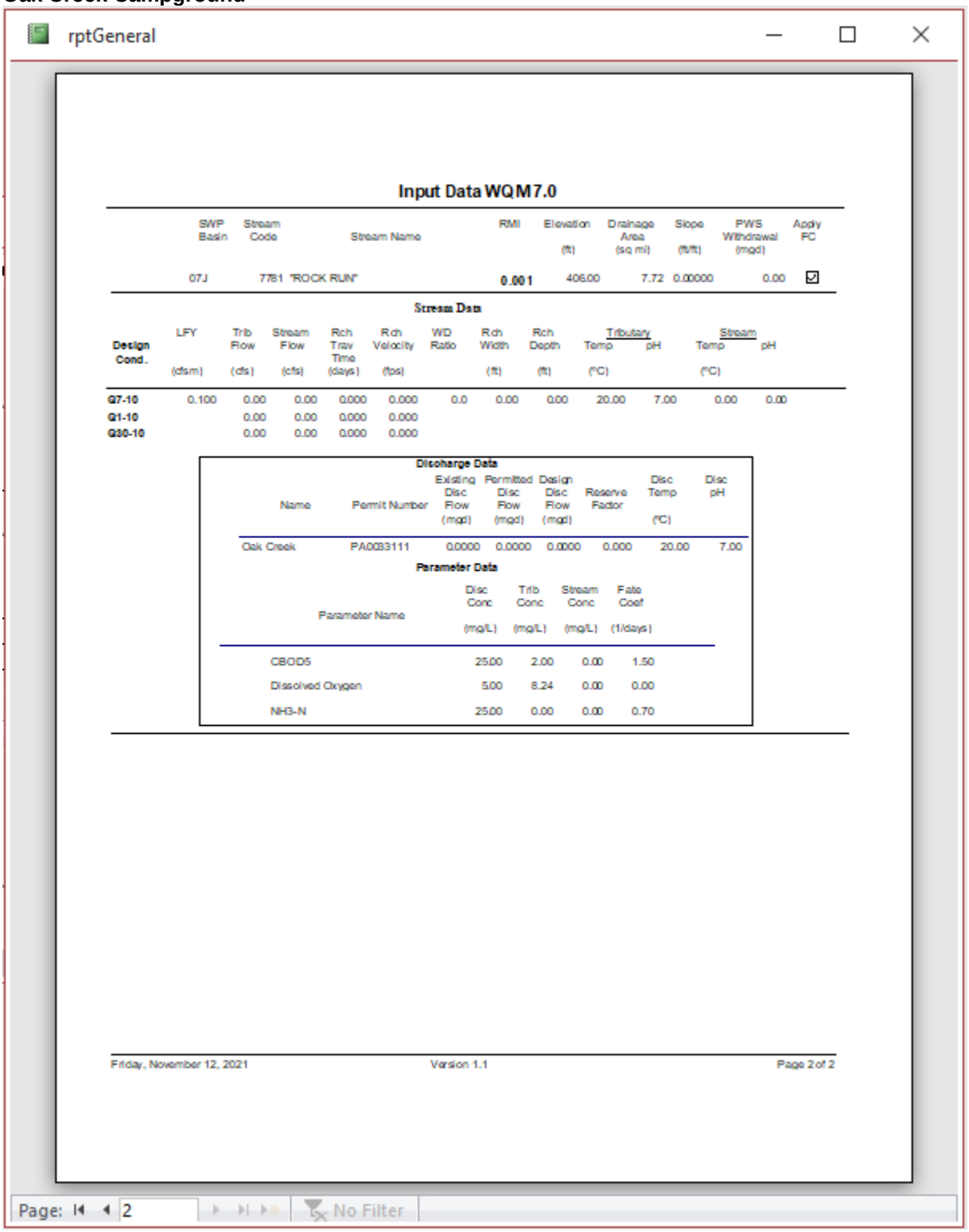
Name	Permit Number	Existing Disc Flow (mgd)	Permitted Disc Flow (mgd)	Design Disc Flow (mgd)	Reserve Factor	Disc Temp (°C)	Disc pH
Oak Creek	PA0033111	0.0042	0.0042	0.0042	0.000	20.00	7.00

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	5.00	8.24	0.00	0.00
NH3-N	25.00	0.00	0.00	0.70

Friday, November 12, 2021 Version 1.1 Page 1 of 2

Page: 1 No Filter



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
07J	7781	"ROCK RUN"	**0.001**	406.00	7.72	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	0.00	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
Oak Creek	PA0033111	0.0000	0.0000	0.0000	0.000	20.00	7.00

Parameter Data

Parameter Name	Disc Conc (mg/L)	Trib Conc (mg/L)	Stream Conc (mg/L)	Fate Coef (1/days)
CBOD5	25.00	2.00	0.00	1.50
Dissolved Oxygen	5.00	8.24	0.00	0.00
NH3-N	25.00	0.00	0.00	0.70

Friday, November 12, 2021 Version 1.1 Page 2 of 2

TRC EVALUATION

Input appropriate values in A3:A9 and D3:D9

0.68	= Q stream (cfs)	0.5	= CV Daily
0.00423	= 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 = 33.168	1.3.2.iii	WLA cfc = 32.329
PENTOXSD TRG	5.1a	LTAMULT afc = 0.373	5.1c	LTAMULT cfc = 0.581
PENTOXSD TRG	5.1b	LTA_afc= 12.359	5.1d	LTA_cfc = 18.794

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)**

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
	Total Monthly	Daily Maximum	Minimum	Average Monthly	Maximum	Instant. Maximum		
Flow (MGD)	Report Avg Mo	Report	XXX	XXX	XXX	XXX	1/week	Measured
pH (S.U.)	XXX	XXX	6.0	XXX	9.0	XXX	1/day	Grab
Total Residual Chlorine	XXX	XXX	XXX	0.5	XXX	1.6	1/day	Grab
Carbonaceous Biochemical Oxygen Demand (CBOD5)	XXX	XXX	XXX	25.0	XXX	50.0	2/month	Grab
Total Suspended Solids	XXX	XXX	XXX	30.0	XXX	60.0	2/month	Grab
Fecal Coliform (CFU/100 ml) May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	XXX	1000	2/month	Grab
Fecal Coliform (CFU/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	Grab

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs)		Concentrations (mg/L)				Minimum Measurement Frequency	Required Sample Type
	Total Monthly	Total Annual	Minimum	Average Monthly	Weekly Average	Instant. Maximum		
Ammonia-Nitrogen	Report	Report	XXX	Report	XXX	XXX	1/quarter	Grab
Nitrate-Nitrite as N	Report	XXX	XXX	Report	XXX	XXX	1/quarter	Grab
Total Kjeldahl Nitrogen	Report	XXX	XXX	Report	XXX	XXX	1/quarter	Grab
Total Phosphorus	Report	Report	XXX	Report	XXX	XXX	1/quarter	Grab
Total Nitrogen	Report	Report	XXX	Report	XXX	XXX	1/quarter	Calculation

Proposed Effluent Limitations and Monitoring Requirements

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

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

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly	Daily Maximum	Minimum	Average Monthly	Maximum	Instant. Maximum		
Flow (MGD)	Report	Report	XXX	XXX	XXX	XXX	1/week	Measured
pH (S.U.)	XXX	XXX	6.0	XXX	XXX	9.0	1/day	Grab
TRC	XXX	XXX	XXX	0.5	XXX	1.6	1/day	Grab
CBOD5	XXX	XXX	XXX	25.0	XXX	50.0	2/month	Grab
TSS	XXX	XXX	XXX	30.0	XXX	60.0	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
E. Coli (No./100 ml)	XXX	XXX	XXX	Report	XXX	XXX	2/month	Grab
Ammonia	XXX	XXX	XXX	Report	XXX	XXX	2/month	Grab

Compliance Sampling Location:

Other Comments:

Proposed Effluent Limitations and Monitoring Requirements

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

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

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Monthly	Annual	Monthly	Monthly Average	Maximum	Instant. Maximum		
Ammonia-Nitrogen	Report	Report	XXX	Report	XXX	XXX	1/quarter	Grab
Nitrate-Nitrite as N	Report	XXX	XXX	Report	XXX	XXX	1/quarter	Grab
Total Kjeldahl Nitrogen	Report	XXX	XXX	Report	XXX	XXX	1/quarter	Grab
Total Phosphorus	Report	Report	XXX	Report	XXX	XXX	1/quarter	Grab
Total Nitrogen	Report	Report	XXX	Report	XXX	XXX	1/quarter	Calculation

Compliance Sampling Location:

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, 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: