pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Northwest Regional Office
CLEAN WATER PROGRAM

Application Type	**Renewal**	Application No.	**PA0222381**
Facility Type	**Non-Municipal**	APS ID	**1088492**
Major / Minor	**Minor**	Authorization ID	**1439686**

NPDES PERMIT FACT SHEET INDIVIDUAL SEWAGE

Applicant and Facility Information

Applicant Name	**Clearfield Jefferson County Region Airport Authority**	Facility Name	**Dubois Region Airport**
Applicant Address	377 Aviation Way	Facility Address	377 Aviation Way
	Reynoldsville, PA 15851-8143		Reynoldsville, PA 15851-8143
Applicant Contact	Robert Shaffer	Facility Contact	
Applicant Phone	(814) 328-5311	Facility Phone	
Client ID	47734	Site ID	453087
Ch 94 Load Status	Not Overloaded	Municipality	Washington Township
Connection Status	No Limitations	County	Jefferson
Date Application Received	May 3, 2023	EPA Waived?	Yes
Date Application Accepted		If No, Reason	

Purpose of Application: Renewal application of an NPDES Permit for a Non-Municipal Minor Sewage Treatment Facility.

Summary of Review

This renewal application is for the treatment of sewage effluent. Based on discussions with the consultant, the airplane deicing activities are not completed indoors and qualifies for “no exposure” conditions.

Treatments consists of (WQM Permit No. 3397405): An Extended aeration style package plant consisting of a comminutor, aeration basin, clarifier, chlorination, dechlorination and aerated digestion.

Act 14 – Notification was submitted and received.

There are NO open violations in WMS for the subject Client ID (47734) as of 2/20/2024.

Sludge use and disposal description and location(s): The facility has disposed of .56 Dry Tons of sewage sludge to the Punxsutawney Boro over the last year.

Public Participation

DEP will publish notice of the receipt of the NPDES permit application and a tentative decision to issue the individual NPDES permit in the *Pennsylvania Bulletin* in accordance with 25 Pa. Code § 92a.82. Upon publication in the *Pennsylvania Bulletin*, DEP will accept written comments from interested persons for a 30-day period (which may be extended for one additional 15-day period at DEP’s discretion), which will be considered in making a final decision on the application. Any person may request or petition for a public hearing with respect to the application. A public hearing may be held if DEP determines that there is significant public interest in holding a hearing. If a hearing is held, notice of the hearing will be published in the *Pennsylvania Bulletin* at least 30 days prior to the hearing and in at least one newspaper of general circulation within the geographical area of the discharge.

Approve	Deny	Signatures	Date
X		Dustin Hargenrater Dustin Hargenrater / Civil Engineer Trainee	February 20, 2024
		(Vacant) / Program Manager	Okay to Draft JCD 3/4/2024

Discharge, Receiving Waters and Water Supply Information

Outfall No.	001	Design Flow (MGD)	0.006
Latitude	41º 10' 52.07"	Longitude	-78º 53' 59.14"
Quad Name	Hazen	Quad Code	41078B8
Wastewater Description:	Treated Sanitary Sewage Effluent		
Receiving Waters	Unnamed Tributary to Keys Run (CWF)	Stream Code	48598
NHD Com ID	123859849	RMI	Dry – 0.12 Perennial – 1.0299
Drainage Area	Dry - .08 Perennial – 0.12	Yield (cfs/mi^2)	Dry – 0.001 Perennial – 0.037
Q_{7-10} Flow (cfs)	Dry – 0 Perennial - 0.004	Q_{7-10} Basis	USGS – StreamStats
Elevation (ft)	Dry – 1760 Perennial - 1740	Slope (ft/ft)	.02355
Watershed No.	17-C	Chapter 93 Class.	CWF
Existing Use	**None**	Existing Use Qualifier	
Exceptions to Use		Exceptions to Criteria	
Assessment Status	Attaining Use(s)		
Cause(s) of Impairment			
Source(s) of Impairment			
TMDL Status		Name	

Background/Ambient Data		Data Source
pH (SU)	7.43	Monitoring Point: 150821 (Located 1.88 mi downstream of discharge)
Temperature (°F)	68	Default - CWF
Hardness (mg/L)		
Other:		

Nearest Downstream Public Water Supply Intake		Hawthorne Area Water Authority	
PWS Waters	Redbank Creek	Flow at Intake (cfs)	30.5
PWS RMI	28.0	Distance from Outfall (mi)	36.5

Changes Since Last Permit Issuance: None

Treatment Facility Summary				
Treatment Facility Name: Dubois Region Airport				
WQM Permit No.	**Issuance Date**			
3397405	11/18/1997			
Waste Type	**Degree of Treatment**	**Process Type**	**Disinfection**	**Avg Annual Flow (MGD)**
Sewage	Secondary With Ammonia Reduction	Extended Aeration	Hypochlorite	0.006
Hydraulic Capacity (MGD)	**Organic Capacity (lbs/day)**	**Load Status**	**Biosolids Treatment**	**Biosolids Use/Disposal**
0.006	33.8	Not Overloaded	Aerobic Digestion	Punxsutawney Boro

Changes Since Last Permit Issuance: Biosolids Use/Disposal updated to Punxsutawney Boro.

Other Comments: The facility has installed a dechlorinator within the permit term to reduce violations of TRC and Fecal Coliform, currently there are still violations for TRC and Fecal Coliform within the permit term but they are in extreme weather months which is expected to cause fluctuations in Fecal Coliform and TRC.

Stormwater Outfalls

Outfall No.	Lat	Long	Receiving Stream
001	41º 10' 53.57"	78º 53' 45.06"	UNT - Keys Run
002	41º 11' 0.43	78º 53' 28.67"	Kyle Run
003A	41º 10' 56.39"	78º 53' 49.67"	UNT - Keys Run
003B	41º 10' 55.77"	78º 53' 49.97"	UNT - Keys Run
003C	41º 10' 55.37"	78º 53' 49.96"	UNT - Keys Run
005	41º 10' 55.22"	78º 53' 47.71"	UNT - Keys Run
006	41º 10' 48.09"	78º 54' 1.87"	UNT - Keys Run
007A	41º 11' 18.33"	78º 53' 32.53"	Keys Run
007B	41º 11' 1.32"	78º 53' 25.78”	Kyle Run
007C	41º 11' 1.37"	78º 53' 41.9"	Keys Run

Other Comments: These outfalls qualify for a no exposure exemption so they will not be included in the permit.

Note: The application identifies 001 as a stormwater outfall and 004 as the sewage discharge. The NPDES permit will denote Outfall 001 as the sewage discharge.

Compliance History

DMR Data for Outfall 001 (from May 1, 2022 to April 30, 2023)

Parameter	APR-23	MAR-23	FEB-23	JAN-23	DEC-22	NOV-22	OCT-22	SEP-22	AUG-22	JUL-22	JUN-22	MAY-22
Flow (MGD) Average Monthly	0.0009	0.00105	0.00053	0.001091	0.000985	0.00073	0.00071	0.00056	0.00064	0.00062	0.0007	0.00046
pH (S.U.) Instantaneous Minimum	6.8	6.7	6.8	6.2	6.0	6.8	6.9	6.9	6.8	6.0	6.9	6.8
pH (S.U.) Instantaneous Maximum	7.3	7.4	7.3	7.3	7.2	7.7	7.7	8.0	7.3	7.1	7.4	7.2
DO (mg/L) Instantaneous Minimum	5.0	6.0	8.0	4.0	6.0	5.0	5.0	4.0	5.0	6.0	5.0	5.0
TRC (mg/L) Average Monthly	< 0.02	< 0.01	< 0.01	< 0.03	< 0.04	< 0.02	< 0.02	0.02	< 0.02	0.01	< 0.02	0.01
TRC (mg/L) Instantaneous Maximum	0.05	0.05	0.43	0.05	0.07	0.04	0.04	0.04	0.04	0.04	0.04	0.03
CBOD5 (mg/L) Average Monthly	4	< 2	3.0	8	5	13	< 3	12	17	22	12	8
TSS (mg/L) Average Monthly	6	11	10	13	19	24	11	23	6	6	7	< 23
Fecal Coliform (No./100 ml) Geometric Mean	23	4	< 180	1842	1177	63	3	< 2	6	4	19	5
Fecal Coliform (No./100 ml) Weekly Average	135	5	> 2420	2420	1414	1986	3	3	36	5	38	9
Total Nitrogen (mg/L) Average Quarterly		1.0			31.1			29.1			17.6	
Total Phosphorus (mg/L) Average Quarterly		0.57			4.25			1.7			1.68	

Compliance History

Effluent Violations for Outfall 001, from: June 1, 2022 To: April 30, 2023

Parameter	Date	SBC	DMR Value	Units	Limit Value	Units
Fecal Coliform	02/28/23	Wkly Avg	> 2420	No./100 ml	10000	No./100 ml

Other Comments: According to the DMR value for the effluent violation listed above, this violation is in compliance as the DMR value of 2420 is well below the limit value.

Summary of Inspections:

Inspection ID: 3465838
Date of Inspection: 11/29/2022
Type of Inspection: Compliance Evaluation
Inspection Result: No Violations Noted
Inspector: Brian Tollini

Development of Effluent Limitations

Outfall No. 001 **Design Flow (MGD)** 0.006
Latitude 41º 10' 54.62" **Longitude** -78º 53' 51.15"
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

This discharge was modeled using WQM 7.0 to evaluate CBOD5, Ammonia-Nitrogen, and Dissolved Oxygen parameters. The modeling results show technology based effluent limitations for CBOD5 are appropriate. The modeling results also confirm that Ammonia-Nitrogen and Dissolved Oxygen limitations are necessary to meet in-stream water quality criterion. Since this facility discharges to a dry stream the dry stream was modeled first. Dry stream conditions exist for roughly .32 miles above the beginning of perennial conditions, the sewage is discharged directly into the dry stream from the facility .12 miles above perennial conditions. The following modeling considerations were used when modeling the dry stream:

D.O. Goal: 2 mg/L for dry streams
CBOD5: In stream concentration of 0 for dry streams
NH3-N: In stream concentration of 0 for dry streams
Yield: 0.001 used for dry streams
Discharge pH: Calculated used averages of June-September (dry season) for the facility

Using the dry stream models D.O. Simulation, we can accurately represent the concentration of the parameters entering the stream at perennial conditions. The perennial stream modeling suggest that more stringent limits were not necessary for CBOD, Dissolved Oxygen, and Ammonia-Nitrogen. This determination was made because the inputted data from the D.O. Simulation did not change when modeling the stream for perennial conditions. This suggests that the effluent that is being discharged is equivalent to secondary treatment standards. This facility was originally intended to begin monitoring for Ammonia-Nitrogen in the last permit term, however the previous reviewer did not code the monitor only limit into WMS. For the new permit term, the facility will be subject to a monitor only condition for Ammonia-Nitrogen with a testing frequency of twice per month to remain consistent with Table 6-3 Self-Monitoring Requirements for Sewage Discharges. Since no actual limit is being placed on the effluent at this time, no compliance schedule will be developed.

Total Residual Chlorine limitations were calculated using the TRC_CALC model and showed no change from the previous limit.

WQM Modeling and TRC_CALC output files will be attached to the bottom of this fact sheet.

Best Professional Judgment (BPJ) Limitations

Comments: BPJ limits to be used for this permit will be for Dissolved Oxygen. Although this parameter was calculated using WQM 7.0, the limits for Dissolved Oxygen are the same as the default values per the SOP for Establishing Effluent Limitations for Individual Sewage Permits.

Anti-Backsliding

N/A

Additional Considerations

Nutrient monitoring is required to establish the nutrient load from the wastewater treatment facility and the impacts that load may have on the quality of the receiving stream(s). Sewage discharges with design flows > 2,000 gpd require monitoring, at a minimum, for Total Nitrogen and Total Phosphorous in new and reissued permits. A monitoring frequency of once per year is acceptable as the discharge is not to waters impaired for nutrients. A monitoring frequency of once per quarter was established in the previous permit cycle and will remain the same.

Monitoring frequency of the proposed effluent limits are based on Table 6-3, Self-Monitoring Requirements for Sewage Dischargers, from the Departments Technical Guidance for the Development and Specification of Effluent Limitations.

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	Average Weekly	Minimum	Average Monthly	Maximum	Instant. Maximum		
Flow (MGD)	Report	XXX	XXX	XXX	XXX	XXX	1/week	Estimate
pH (S.U.)	XXX	XXX	6.0 Inst Min	XXX	XXX	9.0	1/day	Grab
DO	XXX	XXX	4.0 Inst Min	XXX	XXX	XXX	1/day	Grab
TRC	XXX	XXX	XXX	0.5	XXX	1.6	1/day	Grab
CBOD5	XXX	XXX	XXX	25	XXX	50	2/month	Grab
TSS	XXX	XXX	XXX	30	XXX	60	2/month	Grab
Fecal Coliform (No./100 ml) Oct 1 - Apr 30	XXX	XXX	XXX	2000 Geo Mean	10000 Wkly Avg	XXX	2/month	Grab
Fecal Coliform (No./100 ml) May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	1000 Wkly Avg	XXX	2/month	Grab
E. Coli (No./100 ml)	XXX	XXX	XXX	XXX	XXX	Report	1/year	Grab
Total Nitrogen	XXX	XXX	XXX	Report Avg Qrtly	XXX	XXX	1/quarter	Grab
Ammonia-Nitrogen	XXX	XXX	XXX	Report Avg Monthly	XXX	XXX	2/month	Grab
Total Phosphorus	XXX	XXX	XXX	Report Avg Qrtly	XXX	XXX	1/quarter	Grab

Compliance Sampling Location: Outfall 001, after disinfection

Development of WQBEL – TRC_CALC

TRC_CALC

TRC EVALUATION

Input appropriate values in A3:A9 and D3:D9

0.037	= Q stream (cfs)	0.5	= CV Daily
0.006	= Q discharge (MGD)	0.5	= CV Hourly
24	= 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 = 1.291	1.3.2.iii	WLA cfc = 1.251
PENTOXSD TRG	5.1a	LTAMULT afc = 0.373	5.1c	LTAMULT cfc = 0.581
PENTOXSD TRG	5.1b	LTA_afc= 0.481	5.1d	LTA_cfc = 0.727

Source		Effluent Limit Calculations	
PENTOXSD TRG	5.1f	AML MULT = 1.261	
PENTOXSD TRG	5.1g	AVG MON LIMIT (mg/l) = 0.500	BAT/BPJ
		INST MAX LIMIT (mg/l) = 1.597	

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)**

Development of WQBEL – WQM Dry Stream Model

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
17C	48598	Trib 48598 to Keys Run	**0.120**	1760.00	0.08	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	0.001	0.00	0.00	0.000	0.000	0.0	0.00	0.00	20.00	7.43	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
Dubois Reg. Air	PA0222381	0.0060	0.0060	0.0060	0.000	20.00	6.98

Parameter Data

Parameter Name	Disc Conc (mg/L)	Trib Conc (mg/L)	Stream Conc (mg/L)	Fate Coef (1/days)
CBOD5	25.00	0.00	0.00	1.50
Dissolved Oxygen	4.00	8.24	0.00	0.00
NH3-N	25.00	0.00	0.00	0.70

Input Data WQM 7.0

SWP Basin	Stream Code	Stream Name	RMI	Elevation (ft)	Drainage Area (sq mi)	Slope (ft/ft)	PWS Withdrawal (mgd)	Apply FC
17C	48598	Trib 48598 to Keys Run	**0.000**	1740.00	0.12	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	0.001	0.00	0.00	0.000	0.000	0.0	0.00	0.00	20.00	7.43	0.00	0.00
Q1-10		0.00	0.00	0.000	0.000							
Q30-10		0.00	0.00	0.000	0.000							

Discharge Data

Name	Permit Number	Existing Disc Flow (mgd)	Permitted Disc Flow (mgd)	Design Disc Flow (mgd)	Reserve Factor	Disc Temp (°C)	Disc pH
		0.0000	0.0000	0.0000	0.000	20.00	7.43

Parameter Data

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

WQM 7.0 Hydrodynamic Outputs

SWP Basin	Stream Code	Stream Name
17C	48598	Trib 48598 to Keys Run

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												
0.120	0.00	0.00	0.00	NA	0.03157	.252	1.19	4.73	0.03	0.236	20.00	6.98
Q1-10 Flow												
0.120	0.00	0.00	0.00	NA	0.03157	NA	NA	NA	0.00	0.000	0.00	0.00
Q30-10 Flow												
0.120	0.00	0.00	0.00	NA	0.03157	NA	NA	NA	0.00	0.000	0.00	0.00

WQM 7.0 Modeling Specifications

Parameters	D.O.	Use Inputted Q1-10 and Q30-10 Flows	☐
WLA Method	Simulation	Use Inputted W/D Ratio	☐
Q1-10/Q7-10 Ratio	0.64	Use Inputted Reach Travel Times	☐
Q30-10/Q7-10 Ratio	1.36	Temperature Adjust Kr	☑
D.O. Saturation	90.00%	Use Balanced Technology	☑
D.O. Goal	2		

WQM 7.0 D.O.Simulation

SWP Basin	Stream Code	Stream Name
17C	48598	Trib 48598 to Keys Run

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
0.120	0.006	20.000	6.982
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
1.193	0.252	4.730	0.031
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
24.78	1.500	24.78	0.700
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
4.037	27.127	Owens	2
Reach Travel Time (days)			
0.236			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.024	23.92	24.38	4.14
0.047	23.09	23.98	4.24
0.071	22.29	23.59	4.35
0.094	21.52	23.20	4.47
0.118	20.77	22.82	4.58
0.141	20.05	22.45	4.68
0.165	19.35	22.08	4.79
0.189	18.68	21.72	4.89
0.212	18.03	21.36	4.99
0.236	17.40	21.01	5.09

WQM 7.0 Effluent Limits

SWP Basin	Stream Code	Stream Name
17C	48598	Trib 48598 to Keys Run

RMI	Name	Permit Number	Disc Flow (mgd)
0.120	Dubois Reg. Air	PA0222381	0.006

Development of WQBEL – WQM Perennial Conditions Modeling

Input Data WQM 7.0

SWP Basin	Stream Code	Stream Name	RMI	Elevation (ft)	Drainage Area (sq mi)	Slope (ft/ft)	PWS Withdrawal (mgd)	Apply FC
17C	48598	Trib 48598 to Keys Run	1.030	1740.00	0.12	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	0.037	0.00	0.00	0.000	0.000	0.0	0.00	0.00	20.00	7.43	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
Dubois Reg Arpt	PA0222381	0.0060	0.0060	0.0060	0.000	20.00	6.98

Parameter Data

Parameter Name	Disc Conc (mg/L)	Trib Conc (mg/L)	Stream Conc (mg/L)	Fate Coef (1/days)
CBOD5	17.40	2.00	0.00	1.50
Dissolved Oxygen	5.09	8.24	0.00	0.00
NH3-N	21.01	0.10	0.00	0.70

Input Data WQM 7.0

SWP Basin	Stream Code	Stream Name	RMI	Elevation (ft)	Drainage Area (sq mi)	Slope (ft/ft)	PWS Withdrawal (mgd)	Apply FC
17C	48598	Trib 48598 to Keys Run	**0.130**	1588.00	0.53	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	0.041	0.02	0.00	0.000	0.000	0.0	0.00	0.00	20.00	7.43	0.00	0.00
Q1-10		0.00	0.00	0.000	0.000							
Q30-10		0.00	0.00	0.000	0.000							

Discharge Data

Name	Permit Number	Existing Disc Flow (mgd)	Permitted Disc Flow (mgd)	Design Disc Flow (mgd)	Reserve Factor	Disc Temp (°C)	Disc pH
		0.0000	0.0000	0.0000	0.000	20.00	7.43

Parameter Data

Parameter Name	Disc Conc (mg/L)	Trib Conc (mg/L)	Stream Conc (mg/L)	Fate Coef (1/days)
CBOD5	25.00	2.00	0.00	1.50
Dissolved Oxygen	4.00	8.24	0.00	0.00
NH3-N	25.00	0.00	0.00	0.70

WQM 7.0 Hydrodynamic Outputs

SWP Basin	Stream Code	Stream Name
17C	48598	Trib 48598 to Keys Run

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												
1.030	0.00	0.00	0.00	.0093	0.03199	.265	1.47	5.53	0.04	1.551	20.00	7.08
Q1-10 Flow												
1.030	0.00	0.00	0.00	.0093	0.03199	NA	NA	NA	0.00	0.000	0.00	0.00
Q30-10 Flow												
1.030	0.01	0.00	0.00	.0093	0.03199	NA	NA	NA	0.00	0.000	0.00	0.00

WQM 7.0 Modeling Specifications

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

WQM 7.0 Wasteload Allocations

SWP Basin	Stream Code	Stream Name
17C	48598	Trib 48598 to Keys Run

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)		
1.03	Dubois Reg Arpt	17.4	17.4	21.01	21.01	5.09	5.09	0	0

WQM 7.0 D.O.Simulation

SWP Basin	Stream Code	Stream Name
17C	48598	Trib 48598 to Keys Run

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
1.030	0.006	20.000	7.083
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
1.466	0.265	5.532	0.035
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
12.38	1.175	14.19	0.700
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
6.118	27.034	Owens	6
Reach Travel Time (days)			
1.551			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.155	10.32	12.73	6.90
0.310	8.60	11.42	7.18
0.465	7.17	10.25	7.43
0.620	5.97	9.19	7.63
0.776	4.98	8.25	7.82
0.931	4.15	7.40	7.98
1.086	3.46	6.64	8.12
1.241	2.88	5.96	8.24
1.396	2.40	5.34	8.24
1.551	2.00	4.79	8.24

WQM 7.0 Effluent Limits

SWP Basin	Stream Code	Stream Name
17C	48598	Trib 48598 to Keys Run

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)
1.030	Dubois Reg Arpt	PA0222381	0.006	CBOD5	17.4		
				NH3-N	21.01	42.02	
				Dissolved Oxygen			5.09