Pennsylvania Department of Environmental Protection

Northwest Regional Office
CLEAN WATER PROGRAM

NPDES PERMIT FACT SHEET INDIVIDUAL SEWAGE

Application Type	**Renewal**	Application No.	**PA0239194**
Facility Type	**Non-Municipal**	APS ID	**482342**
Major / Minor	**Minor**	Authorization ID	**1270924**

Applicant and Facility Information

Applicant Name	**Christy A & Kenneth J Humanic**	Facility Name	**Cherrytree Land Development**
Applicant Address	4342 State Route 8	Facility Address	4342 State Route 8 Route 8 & Black Road
	Titusville, PA 16354-7562		Titusville, PA 16354
Applicant Contact	Kenneth Humanic	Facility Contact	
Applicant Phone	(814) 827-9600	Facility Phone	
Applicant Email	ken@eandk.net		
Client ID	208896	Site ID	550438
Ch 94 Load Status	Not Overloaded	Municipality	Cherrytree Township
Connection Status	No Limitations	County	Venango
Date Application Received	April 29, 2019	EPA Waived?	Yes
Date Application Accepted	July 21, 2025	If No, Reason	

Purpose of Application: Renewal of a NPDES Permit for a Permitted Discharge of 0.035 MGD

Summary of Review

This is a NPDES permit renewal for a permitted design discharge of 0.035 MGD.

New monthly average limits for Ammonia Nitrogen, TRC and Dissolved Oxygen are being proposed as part of this renewal.

Sludge use and disposal description and location(s): No sludge treatment or disposal is proposed.

Act 14 – Proof of Notification was submitted and received.

SPECTIAL CONDITIONS: NONE

The EPA waiver is in effect.

There are NO open violations in WMS for the subject Client ID (208896) as of August 4, 2025.

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		Aeshah Shameseldin Aeshah Shameseldin / Project Manager	August 4, 2025
X		Adam Olesnanik Adam Olesnanik, P.E. / Environmental Engineer Manager	August 5, 2025

Discharge, Receiving Waters and Water Supply Information

Outfall No.	001	Design Flow (MGD)	0.035
Latitude	41º 35' 0.20"	Longitude	-79º 40' 33.43"
Quad Name	Titusville South	Quad Code	41079E6
Wastewater Description:	Sewage Effluent		

Receiving Waters	Unnamed Tributary to Oil Creek	Stream Code	54208
NHD Com ID	100473881	RMI	0.21
Drainage Area	0.22	Yield (cfs/mi^2)	0.068
Q_{7-10} Flow (cfs)	0.0149	Q_{7-10} Basis	Calculated
Elevation (ft)	1501	Slope (ft/ft)	---
Watershed No.	16-E	Chapter 93 Class.	CWF
Existing Use	---	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)	7.0	Default
Temperature (°F)	68	Default
Hardness (mg/L)	100	Default
Other:		

Nearest Downstream Public Water Supply Intake	Aqua Pennsylvania, Inc. - Emlenton		
PWS Waters	Allegheny River	Flow at Intake (cfs)	---
PWS RMI	90.0	Distance from Outfall (mi)	---

Changes Since Last Permit Issuance: None.

Other Comments: None.

Treatment Facility Summary				
Treatment Facility Name: Cherrytree Land Development				
WQM Permit No.	**Issuance Date**			
None				
Waste Type	**Degree of Treatment**	**Process Type**	**Disinfection**	**Avg Annual Flow (MGD)**
Sewage	Secondary With Ammonia Reduction	Activated Sludge	Hypochlorite	0.035
Hydraulic Capacity (MGD)	**Organic Capacity (lbs/day)**	**Load Status**	**Biosolids Treatment**	**Biosolids Use/Disposal**
0.035		Not Overloaded		

Changes Since Last Permit Issuance: None.

Other Comments: The system is intended to serve a development of approximately 400 acres. Project flows include approximately 40 residential EDU's. 87.5 commercial EDU's and 250 industrial EDU's. Estimated total flows are 16,000 GPD for residential, 35,000 GPD for commercial and 100,000 GPD for industrial uses, serving an estimated residential population of 140. Upon full buildout, the site is expected to include approximately 377.5 EDU's. Lot sizes for residential, commercial and industrial areas will be finalized as needed to support the facility.

The project consists of multiple phases. Planning approval was for a sewage discharge of 0.035-MGD for the first phase. Details regarding the follow-up phases are unknown. The total anticipated discharge upon full buildout is 0.151-MGD, with an estimated organic load of 144-PPD, however, the ultimate design has not been clearly approved by planning. No WQM permit is currently available. Neither the wastewater treatment system nor the associated discharge currently exists.

Currently the waste sources are: one private house, a small manufacturing company (E&K Group consisting of E&K Equipment Inc, Eagle Hoist & Winch Co, Eagle Custom Fab and E&K Surplus Supply) and Timber Lake Lodge.

Currently a holding tank is in use.

Compliance History

DMR Data for Outfall 001 (from June 1, 2024, to May 31, 2025)

Parameter	MAY-25	APR-25	MAR-25	FEB-25	JAN-25	DEC-24	NOV-24	OCT-24	SEP-24	AUG-24	JUL-24	JUN-24
No discharge in past year.												

Compliance History

Effluent Violations for Outfall 001, from: July 1, 2024, To: May 31, 2025

Parameter	Date	SBC	DMR Value	Units	Limit Value	Units
No violations to report						

Summary of Inspections: None.

Other Comments: None.

Development of Effluent Limitations

Outfall No. 001 **Design Flow (MGD)** .035
Latitude 41º 35' 0.20" **Longitude** -79º 40' 33.43"
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)
E. Coli	Report (No./100 ml)	IMAX	-	§ 92a.61

Comments: Monitoring for E. Coli is placed in the permit in accordance with the Department's SOP entitled "Establishing Effluent Limitations for Individual Sewage Permits."

Water Quality-Based Limitations

CBOD5, Ammonia, and DO are evaluated using WQM 7.0 (Attachment 1). TRC is evaluated using the Department's TRC evaluation spreadsheet (Attachment 2).

The following limitations were determined through water quality modeling (output files attached):

Parameter	Limit (mg/l)	SBC	Model
Dissolved Oxygen	6.0	Daily Min.	WQM 7.0
CBOD5	25	Average Monthly	WQM 7.0
	50	IMAX	
Ammonia Nitrogen (May 1 – Oct 31)	2.02	Average Monthly	WQM 7.0
	4.04	IMAX	
TRC	0.049	Average Monthly	TRC evaluation spreadsheet

Comments: The WQM modeling has determined a more stringent average monthly Ammonia Nitrogen limit under perennial conditions. As part of this renewal, new monitoring requirements are being proposed.

The Department's TRC evaluation spreadsheet has determined a more stringent average monthly limit for TRC under perennial conditions. As part of this renewal, new monitoring requirements are being proposed.

As there are currently no treatment facilities or discharge, an interim period with a compliance schedule will not be established in this renewal. The Permittee is advised to consider the newly established limits in the design and development of any future treatment facilities.

Best Professional Judgment (BPJ) Limitations

Comments: Monitoring for total nitrogen, total phosphorus, $CBOD_5$ and TSS are placed in the permit in accordance with the Department's SOP entitled "Establishing Effluent Limitations for Individual Sewage Permits."

Anti-Backsliding

N/A

Proposed Effluent Limitations and Monitoring Requirements

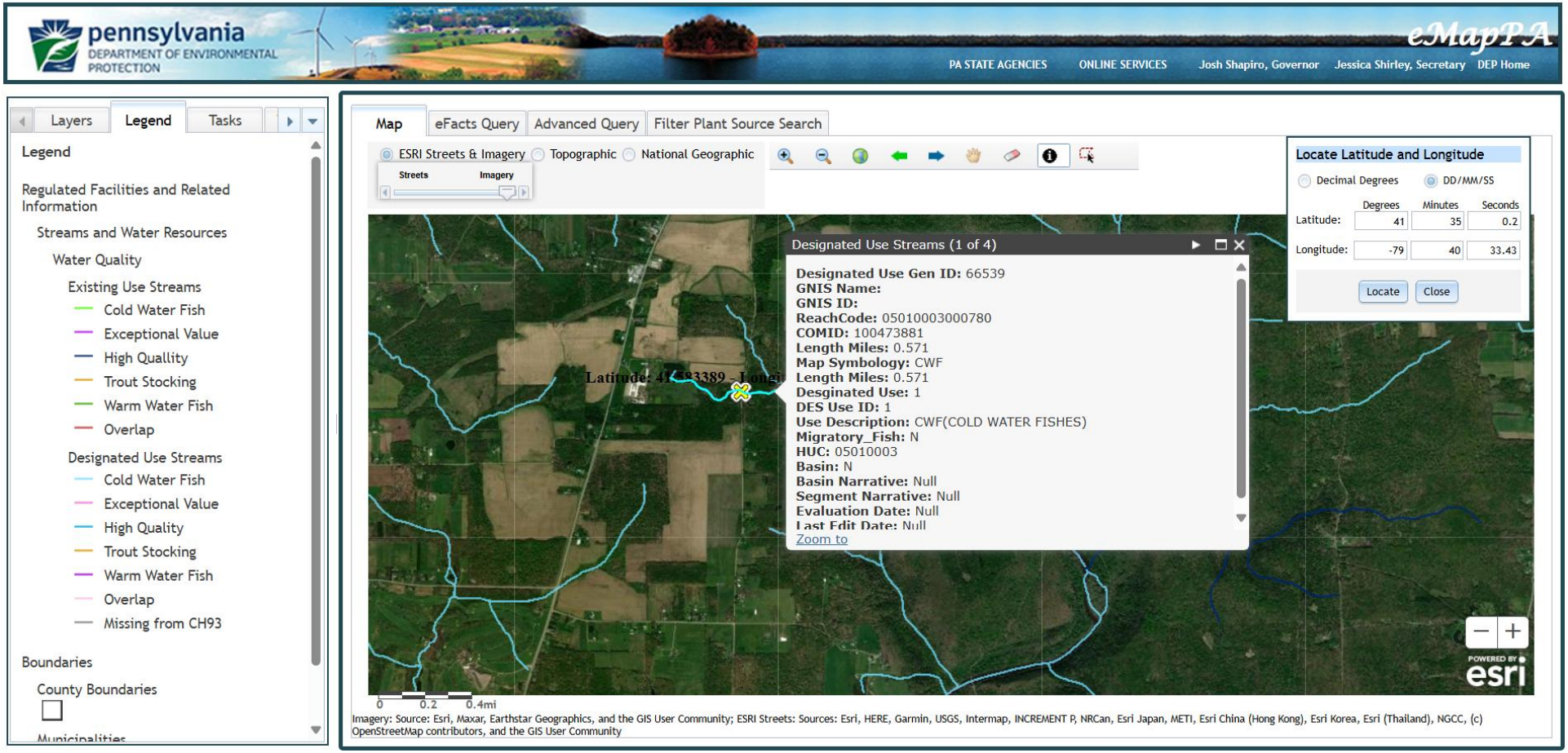
The limitations and monitoring requirements specified below are proposed for the draft permit, and reflect the most stringent limitations amongst technology, water quality and BPJ. Instantaneous Maximum (IMAX) limits are determined using multipliers of 2 (conventional pollutants) or 2.5 (toxic pollutants). 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	Daily Maximum	Instant. Maximum		
Flow (MGD)	Report	XXX	XXX	XXX	XXX	XXX	1/week	Measured
pH (S.U.)	XXX	XXX	6.0 Inst Min	XXX	XXX	9.0	1/day	Grab
DO	XXX	XXX	6.0 Daily Min	XXX	XXX	XXX	1/day	Grab
TRC	XXX	XXX	XXX	0.049	XXX	0.16	1/day	Grab
CBOD5	XXX	XXX	XXX	25.0	XXX	50	2/month	8-Hr Composite
TSS	XXX	XXX	XXX	30.0	XXX	60	2/month	8-Hr Composite
Fecal Coliform (No./100 ml) Oct 1 - Apr 30	XXX	XXX	XXX	2000 Geo Mean	XXX	10000	2/month	Grab
Fecal Coliform (No./100 ml) May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	XXX	1000	2/month	Grab
E. Coli (No./100 ml)	XXX	XXX	XXX	XXX	Report	XXX	1/year	Grab
Total Nitrogen	XXX	XXX	XXX	Report	XXX	XXX	2/month	8-Hr Composite
Ammonia Nov 1 - Apr 30	XXX	XXX	XXX	6.06	XXX	12.12	2/month	8-Hr Composite
Ammonia May 1 - Oct 31	XXX	XXX	XXX	2.02	XXX	4.04	2/month	8-Hr Composite
Total Phosphorus	XXX	XXX	XXX	Report	XXX	XXX	2/month	8-Hr Composite

Compliance Sampling Location: Outfall 001, after disinfection.

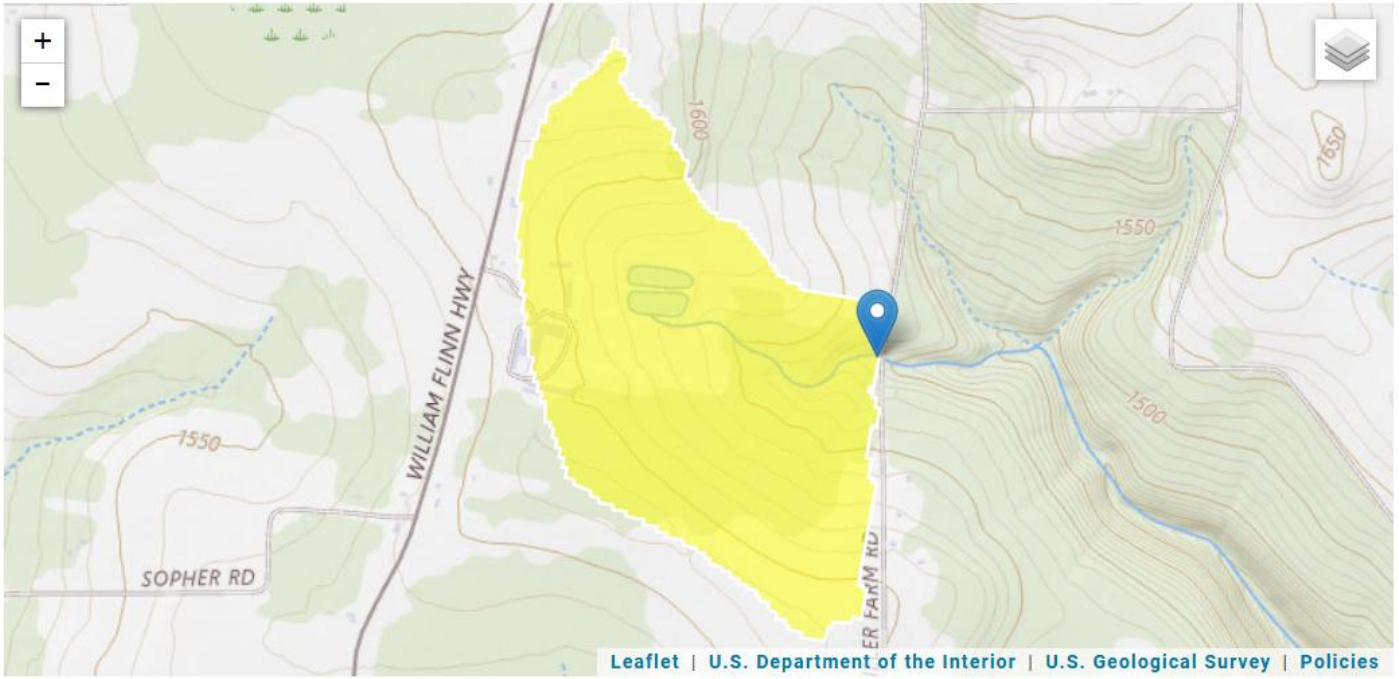
Outfall Location - eMap with Aerial Imagery



Drainage Area Location – StreamStats with Aerial Imagery

StreamStats Report

Region ID:	PA
Workspace ID:	PA20250722195231943000
Clicked Point (Latitude, Longitude):	41.58345, -79.67601
Time:	2025-07-22 15:52:53 -0400



Collapse All

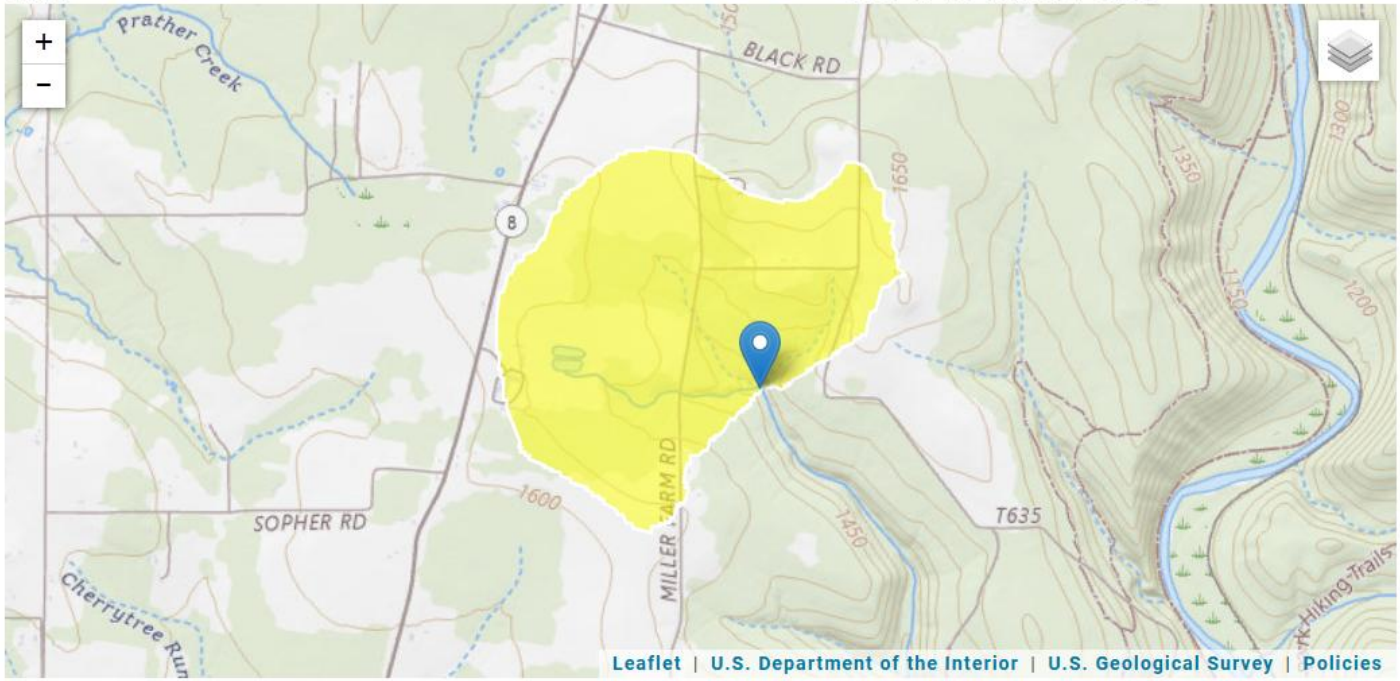
Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	0.22	square miles

Perennial Reach - Drainage Area Location – StreamStats with Aerial Imagery

StreamStats Report

Region ID:	PA
Workspace ID:	PA20250722195452625000
Clicked Point (Latitude, Longitude):	41.58355, -79.67183
Time:	2025-07-22 15:55:14 -0400



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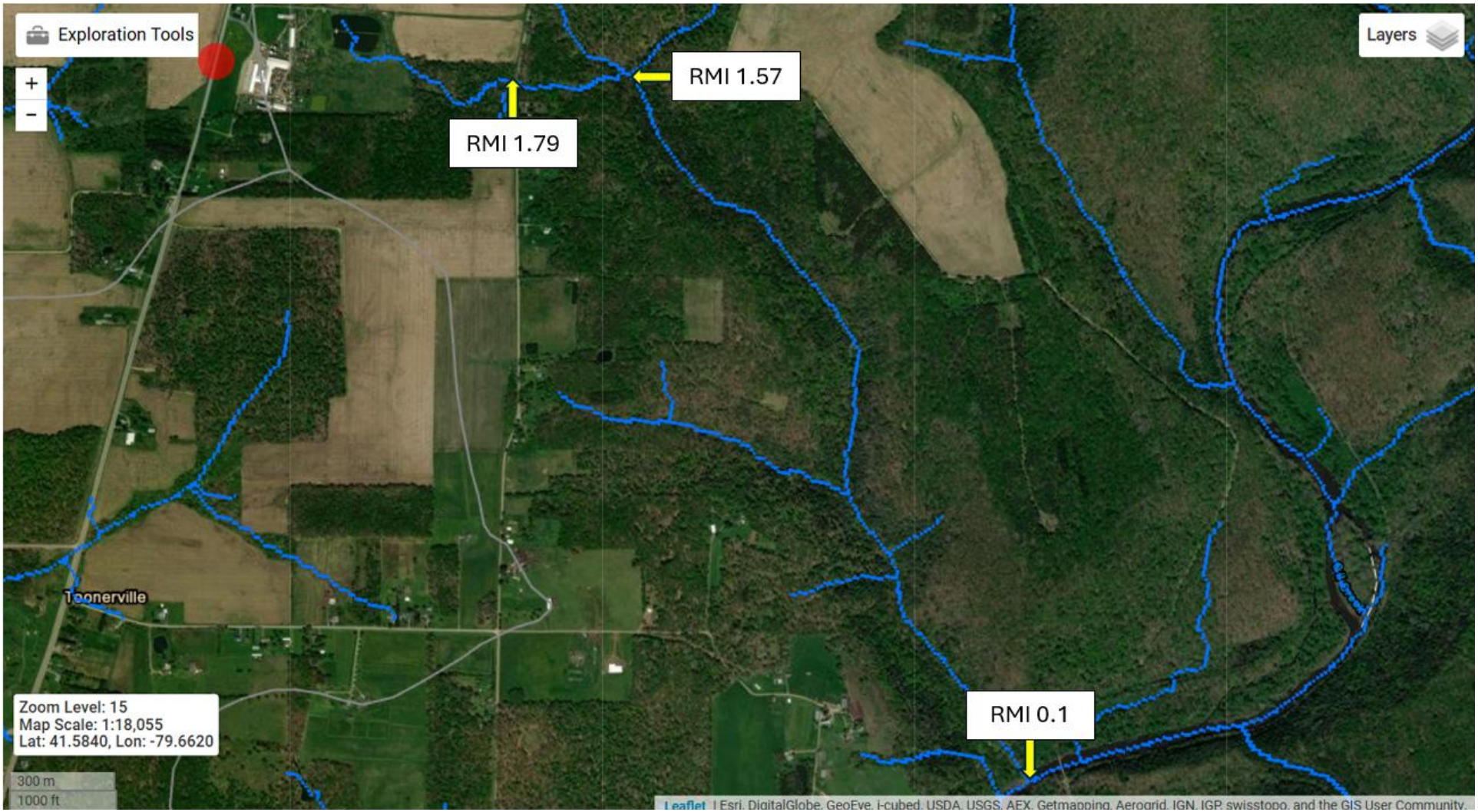
Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	0.67	square miles

For modeling purposes, the outfall location was assigned an RMI value of 1.79, although the actual value on the receiving stream is 0.21.



Attachment 1

WQM 7.0 Effluent Limits

SWP Basin	Stream Code	Stream Name
16E	54205	Trib 54205 to Oil Creek

RMI	Name	Permit Number	Disc Flow (mgd)	Parameter	Effl. Limit 30-day Ave. (mg/L)	Effl. Limit Maximum (mg/L)	Effl. Limit Minimum (mg/L)
1.790	Cherrytree Land	PA0239194	0.035	CBOD5	25		
				NH3-N	2.02	4.04	
				Dissolved Oxygen			6

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	0.64	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 D.O.Simulation

SWP Basin	Stream Code	Stream Name
16E	54205	Trib 54205 to Oil Creek

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
1.790	0.035	23.918	7.000
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
2.371	0.361	6.575	0.081
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
20.02	1.462	1.60	0.946
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
6.485	29.122	Owens	6
Reach Travel Time (days)			
0.166			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.017	19.45	1.58	6.50
0.033	18.89	1.55	6.53
0.050	18.35	1.53	6.57
0.067	17.82	1.50	6.61
0.083	17.31	1.48	6.66
0.100	16.81	1.46	6.70
0.116	16.33	1.43	6.75
0.133	15.86	1.41	6.80
0.150	15.40	1.39	6.84
0.166	14.96	1.37	6.89

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
1.570	0.035	22.715	7.000
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
3.643	0.364	10.003	0.075
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
10.98	1.176	0.93	0.863
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
7.305	26.472	Owens	6
Reach Travel Time (days)			
1.195			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.120	9.37	0.84	7.83
0.239	7.99	0.76	7.84
0.359	6.81	0.68	7.84
0.478	5.81	0.62	7.84
0.598	4.95	0.56	7.84
0.717	4.22	0.50	7.84
0.837	3.60	0.45	7.84
0.956	3.07	0.41	7.84
1.076	2.62	0.37	7.84
1.195	2.23	0.33	7.84

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
16E	54205	Trib 54205 to Oil Creek	**1.790**	1501.00	0.22	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	0.068	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
Cherrytree Land	PA0239194	0.0350	0.0000	0.0000	0.000	25.00	7.00

Parameter Data

Parameter Name	Disc Conc (mg/L)	Trib Conc (mg/L)	Stream Conc (mg/L)	Fate Coef (1/days)
CBOD5	25.00	2.00	0.00	1.50
Dissolved Oxygen	4.00	8.24	0.00	0.00
NH3-N	25.00	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
16E	54205	Trib 54205 to Oil Creek	**1.570**	1430.00	0.67	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	0.068	0.00	0.00	0.000	0.000	0.0	0.00	0.00	20.00	7.00	0.00	0.00
Q1-10		0.00	0.00	0.000	0.000							
Q30-10		0.00	0.00	0.000	0.000							

Discharge Data

Name	Permit Number	Existing Disc Flow (mgd)	Permitted Disc Flow (mgd)	Design Disc Flow (mgd)	Reserve Factor	Disc Temp (°C)	Disc pH
		0.0000	0.0000	0.0000	0.000	25.00	7.00

Parameter Data

Parameter Name	Disc Conc (mg/L)	Trib Conc (mg/L)	Stream Conc (mg/L)	Fate Coef (1/days)
CBOD5	25.00	2.00	0.00	1.50
Dissolved Oxygen	3.00	8.24	0.00	0.00
NH3-N	25.00	0.00	0.00	0.70

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
16E	54205	Trib 54205 to Oil Creek	**0.100**	1111.00	1.71	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	0.068	0.00	0.00	0.000	0.000	0.0	0.00	0.00	20.00	7.00	0.00	0.00
Q1-10		0.00	0.00	0.000	0.000							
Q30-10		0.00	0.00	0.000	0.000							

Discharge Data

Name	Permit Number	Existing Disc Flow (mgd)	Permitted Disc Flow (mgd)	Design Disc Flow (mgd)	Reserve Factor	Disc Temp (°C)	Disc pH
		0.0000	0.0000	0.0000	0.000	25.00	7.00

Parameter Data

Parameter Name	Disc Conc (mg/L)	Trib Conc (mg/L)	Stream Conc (mg/L)	Fate Coef (1/days)
CBOD5	25.00	2.00	0.00	1.50
Dissolved Oxygen	3.00	8.24	0.00	0.00
NH3-N	25.00	0.00	0.00	0.70

WQM 7.0 Wasteload Allocations

SWP Basin	Stream Code	Stream Name
16E	54205	Trib 54205 to Oil 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
1.790	Cherrytree Land	11.78	13.85	11.78	13.85	0	0
1.570		NA	NA	12.8	NA	NA	NA

NH3-N Chronic Allocations

RMI	Discharge Name	Baseline Criterion (mg/L)	Baseline WLA (mg/L)	Multiple Criterion (mg/L)	Multiple WLA (mg/L)	Critical Reach	Percent Reduction
1.790	Cherrytree Land	1.49	2.02	1.49	2.02	0	0
1.570		NA	NA	1.62	NA	NA	NA

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)		
1.79	Cherrytree Land	25	25	2.02	2.02	6	6	0	0
1.57		NA	NA	NA	NA	NA	NA	NA	NA

WQM 7.0 Hydrodynamic Outputs

SWP Basin	Stream Code	Stream Name
16E	54205	Trib 54205 to Oil 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												
1.790	0.01	0.00	0.01	.0541	0.06112	.361	2.37	6.58	0.08	0.166	23.92	7.00
1.570	0.05	0.00	0.05	.0541	0.04110	.364	3.64	10	0.08	1.195	22.72	7.00
Q1-10 Flow												
1.790	0.01	0.00	0.01	.0541	0.06112	NA	NA	NA	0.08	0.174	24.25	7.00
1.570	0.03	0.00	0.03	.0541	0.04110	NA	NA	NA	0.07	1.322	23.25	7.00
Q30-10 Flow												
1.790	0.02	0.00	0.02	.0541	0.06112	NA	NA	NA	0.08	0.160	23.63	7.00
1.570	0.06	0.00	0.06	.0541	0.04110	NA	NA	NA	0.08	1.098	22.33	7.00

Attachment 2

TRC EVALUATION

Input appropriate values in A3:A9 and D3:D9

0.0149	= Q stream (cfs)	0.5	= CV Daily
0.035	= 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)	0	=Decay Coefficient (K)

Source	Reference	AFC Calculations		Reference	CFC Calculations	
TRC	1.3.2.iii	WLA afc =	0.107	1.3.2.iii	WLA cfc =	0.097
PENTOXSD TRG	5.1a	LTAMULT afc =	0.373	5.1c	LTAMULT cfc =	0.581
PENTOXSD TRG	5.1b	LTA_afc=	0.040	5.1d	LTA_cfc =	0.056

Source		Effluent Limit Calculations		
PENTOXSD TRG	5.1f	AML MULT =	1.231	
PENTOXSD TRG	5.1g	AVG MON LIMIT (mg/l) =	0.049	AFC
		INST MAX LIMIT (mg/l) =	0.160	

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)**