pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Northwest Regional Office
CLEAN WATER PROGRAM

Application Type	**Renewal**	Application No.	**PA0222160**
Facility Type	**Non-Municipal**	APS ID	**1048645**
Major / Minor	**Minor**	Authorization ID	**1371026**

NPDES PERMIT FACT SHEET INDIVIDUAL SEWAGE

Applicant and Facility Information

Applicant Name	**John Chrzanowski**	Facility Name	**Hemlock MHP**
Applicant Address	PO Box 72158	Facility Address	Hemlock Road
	Thorndale, PA 19372-0158		Grove City, PA 16127
Applicant Contact	John Chrzanowski	Facility Contact	
Applicant Phone	(484) 467-0670	Facility Phone	(484) 467-0670
Applicant E Mail	Hemlock.village@verizon.net	Facility E Mail	
Client ID	289964	Site ID	464861
Municipality	Wolf Creek Township	County	Mercer
Ch 94 Load Status	Not Overloaded	Connection Status	No Limitations
Received	September 29, 2021	EPA Waived?	Yes
Accepted	October 5, 2021	If No, Reason	

Purpose of Application: NPDES permit renewal

Summary of Review

WMS reports compliance with no current violations. Previously they were cited for effluent violations on November 9 and October 10, 2021. The October 2021 discharge report summary shows significant high values for CBOD5, TSS, and fecal coliform and a one-time low DO value. Current monitoring shows improved operation and possibly more frequent disinfection inspections. Sewage sludge is sent to Hermitage STP for final treatment.

Daily DO, pH and TRC monitoring is proposed. This is up from 4 per week. The daily monitoring frequency was previously proposed but relaxed in the issued permit. Also, annual e. coli monitoring is proposed.

The facility has a phased build out. Phase I operation is for 34 sites, 0.00939-MGD and 15.2-PPD. Ultimate design is for 67 sites, 0.01675-MGD and 34.92-PPD. Formerly a polishing sand filter and solution hypochlorite disinfection was permitted. This authorization has been cancelled as not necessary.

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		William H. Mentzer William H. Mentzer, P.E. Environmental Engineering Specialist	July 26, 2021
X		Vacant Environmental Engineer Manager	Okay to Draft JCD 8/8/2022

Discharge, Receiving Waters and Water Supply Information

Outfall No.	001	Design Flow (MGD)	0.01675
Latitude DP	41º 12' 12.00"	Longitude DP	-80º 2' 19.00"
Latitude NHD	41º 12' 25.49"	Longitude NHD	-80º 2' 23.06"
Quad Name	Grove City	Quad Code	0905
Wastewater:	Treated mobile home park domestic wastes		
Receiving Waters	Tributary to East Branch Wolf Creek	Stream Code	unknown
NHD Com ID	126219135	RMI	0.27
Drainage Area	0.01	Yield (cfs/mi^2)	0
Q_{7-10} Flow (cfs)	0	Q_{7-10} Basis	Dry stream
Elevation (ft)	1300	Slope (ft/ft)	0.02945
Watershed No.	20-C	Chapter 93 Class.	CWF
Existing Use	**statewide**	Existing Use Qualifier	none
Exceptions to Use	none	Exceptions to Criteria	none
Comments	NHD outfall is at E Branch Wolf Creek 34348 Node RMI 1.01 and stream RMI 1.36204, drainage 20.19 sq mile and elevation 1257.33 feet. Wolf Creek 34242 confluence is at RMI 16.117734, Drainage 23.1 square miles and elevation 1246.29-feet		
Low Flow	Muddy Creek at Isle, low flow 0.4-cfs, drainage 29.4 sq mi, yield 0.013605-cfs/square mile		
Assessment Status	Attaining Use(s)		
Cause(s) of Impairment			
Source(s) of Impairment			
TMDL Status		Name	

Background/Ambient Data		Data Source
pH (SU)		
Temperature (°F)		
Hardness (mg/L)		
Other:		

Nearest Downstream Public Water Supply Intake	Pennsylvania American Water		
PWS Waters	Connoquenessing Creek	Flow at Intake (cfs)	NA
PWS RMI	0.01	Distance from Outfall (mi)	41.82

Changes Since Last Permit Issuance: Formerly the first down stream public water supply intake was by the Pennsylvania American Water Ellwood City District. This intake has been discontinued and replaced by the Pennsylvania American Water intake at the mouth of the Connoquenessing Creek

Other Comments: none

Treatment Facility Summary

Treatment Facility Name: Hemlock MHP

WQM Permit No.	Issuance Date	Flow	PPD	Homes
4397411 T3	**18 October 2011**	0.01675	34.92	67
4397411 T3	16 December 2011	0.00939	15.42	34

Waste Type	Degree of Treatment	Process Type	Disinfection	Avg Annual Flow (MGD)
Sewage	Secondary,Tertiary	Rotat Biological Contactors W/Sol Rmov,Rotating Biological Contactors	Hypochlorite	0.00939

Hydraulic Capacity (MGD)	Organic Capacity (lbs/day)	Load Status	Biosolids Treatment	Biosolids Use/Disposal
0.0168	15.2	Not Overloaded	Gravity Thickening	Other WWTP

Changes Since Last Permit Issuance: None

Other Comments:

Treatment: equalization, primary clarification, Geo-drum (Geo-Form) reactor, final clarification, sludge handling (holding), and chlorination. Facility was built in 1998. Final (ultimate) design organic load is 34.93-PPD.

A sand filter has been proposed, never built and the facility design cancelled. The facility two phase build-out remains. The tertiary treatment citation above may be related to the cancelled sand filter facilities.

Final design is for 67 homes, 0.01675-MGD and 34.92 –PPD.

Compliance History

DMR Data for Outfall 001 (from September 1, 2020 to August 31, 2021)

Parameter	AUG-21	JUL-21	JUN-21	MAY-21	APR-21	MAR-21	FEB-21	JAN-21	DEC-20	NOV-20	OCT-20	SEP-20
Flow (MGD) Average Monthly	0.005	0.025	0.045	0.050	0.50	0.050	0.005	0.055	0.053	0.045	0.005	0.055
pH (S.U.) Minimum	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
pH (S.U.) Instant Maximum	7.4	7.4	7.6	7.3	7.4	7.4	7.3	7.3	7.5	7.3	7.4	7.4
DO (mg/L) Minimum	4.0	4.0	3.9	4.0	4.1	4.0	4.1	4.3	4.5	4.0	4.0	4.0
TRC (mg/L) Average Monthly	0.31	0.3	0.40	0.19	0.31	0.28	0.3	0.32	0.32	0.33	0.26	0.28
TRC (mg/L) Instant Maximum	0.51	0.49	0.53	0.41	0.47	0.49	0.49	0.49	0.49	0.49	0.42	0.49
CBOD5 (mg/L) Average Monthly	23.4	20.0	**54.9**	**46.7**	**33.4**	**39.5**	**46.8**	19.8	**25.9**	15.75	10.6	14.5
CBOD5 (mg/L) Instant Maximum	28.8	26.3	57.3	56.1	44.3	57.3	70.4	22.3	38.9	16.3	13.4	22.7
TSS (mg/L) Average Monthly	**40.0**	**55.0**	**78.0**	**43.0**	28.0	33.0	32.0	15.0	16.5	12.0	16.0	18.0
TSS (mg/L) Instant Maximum	56.0	67.0	116.0	60.0	38.0	48.0	54.0	19.0	28.0	19.0	16.0	33.0
Fecal Coliform (#/100 ml) Geometric Mean	49.0	49	1	**1087.8**	110	49.2	49.2	1	2	49.2	163.2	49
Fecal Coliform (#/100 ml) Instant Maximum	**2420**	**2420**	1	**2420**	**2420**	2420	2420	1	2	2420	2420.0	2420
Total Nitrogen (mg/L) Average Monthly	28.4	36.3	51.3	54.0	31.0	33.9	30.4	32.7	32.3	34.8	33.25	34.6
Ammonia (mg/L) Average Monthly	20.7	21.4	36.9	36.7	23.3	27.0	21.7	20.6	24.7	23.6	24.4	20.7
Total Phosphorus (mg/L) Ave Monthly	5.34	6.2	8.22	5.91	4.44	4.31	2.9	4.15	4.72	4.93	4.77	4.62

Marginal DO June.
High CBOD5 June, May, April, March, February, December,
High TSS in August, July, June, May, March, February,
High Coliform August, July, May, April, March, February, November, October and September

DMR Data for Outfall 001 (from September 1, 2021 to May 31, 2022)

Parameter	MAY-22	APR-22	MAR-22	FEB-22	JAN-22	DEC-21	NOV-21	OCT-21	SEP-21
Flow (MGD) Average Monthly	0.005	0.050	54	0.055	0.051	0.053	0.051	0.004	0.048
pH (S.U.) Minimum	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
pH (S.U.) Instantaneous Maximum	7.3	7.2	7.2	7.3	7.2	7.2	7.2	7.3	7.3
DO (mg/L) Minimum	4.0	4.1	4.1	4.1	4.3	4.3	4.6	4.3	4.0
TRC (mg/L) Average Monthly	0.25	0.26	0.3	**1.55**	.0.27	0.3	0.3	0.29	0.3
TRC (mg/L) Instantaneous Maximum	0.38	0.47	0.46	**21.0**	0.41	0.47	0.46	0.46	0.43
CBOD5 (mg/L) Average Monthly	**32.8**	< 15.5	< 18.0	11.7	19.7	12.9	10.7	13.4	9.1
CBOD5 (mg/L) Instantaneous Maximum	48.5	27.9	< 23.0	18.8	22.7	13.2	12.9	10.8	9.8
TSS (mg/L) Average Monthly	23.0	20.0	3.0	15.0	12.0	13.0	19.5	11.0	23.0
TSS (mg/L) Instantaneous Maximum	34.0	27.0	4.0	20.0	14.0	14.0	23.0	11.0	24.0
Fecal Coliform (#/100 ml) Geometric Mean	1	**2420**	< 1.0	< 1	1.0	1.0	1.0	< 1	< 1.0
Fecal Coliform (#100 ml) Instantaneous Maximum	1	**2420**	1	< 1	1.0	1.0	1.0	< 1	1.0
Total Nitrogen (mg/L) Average Monthly	33.4	37.1	25.8	27.3	31.3	32.5	32.1	31.0	26.5
Ammonia (mg/L) Average Monthly	21.7	25.9	15.4	17.8	21.8	11.47	25.2	22.6	21.2

High fecals in April.
High TRC in February.
High CBOD5 in May.
Improved operation.
The high CBD5 should not be significant.
The high TRC and fecals indicate the need for more frequent monitoring,

Compliance History

Effluent Violations for Outfall 001, from: October 1, 2020 To: August 31, 2021

Parameter	Date	SBC	DMR Value	Units	Limit Value	Units
DO	06/30/21	Min	3.9	mg/L	4.0	mg/L
CBOD5	06/30/21	Avg Mo	54.9	mg/L	25.0	mg/L
CBOD5	02/28/21	Avg Mo	46.8	mg/L	25.0	mg/L
CBOD5	03/31/21	Avg Mo	39.5	mg/L	25.0	mg/L
CBOD5	12/31/20	Avg Mo	25.9	mg/L	25.0	mg/L
CBOD5	04/30/21	Avg Mo	33.4	mg/L	25.0	mg/L
CBOD5	05/31/21	Avg Mo	46.7	mg/L	25.0	mg/L
CBOD5	06/30/21	IMAX	57.3	mg/L	50.0	mg/L
CBOD5	05/31/21	IMAX	56.1	mg/L	50.0	mg/L
CBOD5	03/31/21	IMAX	57.3	mg/L	50.0	mg/L
CBOD5	02/28/21	IMAX	70.4	mg/L	50.0	mg/L
TSS	06/30/21	Avg Mo	78.0	mg/L	30.0	mg/L
TSS	08/31/21	Avg Mo	40.0	mg/L	30.0	mg/L
TSS	03/31/21	Avg Mo	33.0	mg/L	30.0	mg/L
TSS	07/31/21	Avg Mo	55.0	mg/L	30.0	mg/L
TSS	05/31/21	Avg Mo	43.0	mg/L	30.0	mg/L
TSS	02/28/21	Avg Mo	32.0	mg/L	30.0	mg/L
TSS	06/30/21	IMAX	116.0	mg/L	60.0	mg/L
TSS	07/31/21	IMAX	67.0	mg/L	60.0	mg/L
Fecal Coliform	05/31/21	Geo Mean	1087.8	CFU/100 ml	200	CFU/100 ml
Fecal Coliform	07/31/21	IMAX	2420	CFU/100 ml	1000	CFU/100 ml
Fecal Coliform	05/31/21	IMAX	2420	CFU/100 ml	1000	CFU/100 ml
Fecal Coliform	08/31/21	IMAX	2420	CFU/100 ml	1000	CFU/100 ml

Effluent Violations for Outfall 001, from: September 1, 2021 To: May 31, 2022

Parameter	Date	SBC	DMR Value	Units	Limit Value	Units
TRC	02/28/22	Avg Mo	1.55	mg/L	.5	mg/L
TRC	02/28/22	IMAX	21.0	mg/L	1.6	mg/L
CBOD5	05/31/22	Avg Mo	32.8	mg/L	25.0	mg/L
Fecal Coliform	04/30/22	Geo Mean	2420	CFU/100 ml	2000	CFU/100 ml

Development of Effluent Limitations

Outfall No. 001 **Design Flow (MGD)** 0.00939
Latitude 41º 12' 12.00" **Longitude** -80º 2' 19.00"
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©	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)
DO	4.0	Daily minimum		BPJ

Comments: Weekly requirements are for POTWs.

Water Quality-Based Limitations

A sewerage based "Reasonable Potential Analysis" determined the following parameters were candidates for limitations or monitoring: BOD5, CBOD5, TSS, ammonia, nitrogen, phosphorus, DO, TRC, UV radiation, bacteria and pH.

The existing permit has ammonia. Nitrogen and phosphorus monitoring. E coli annual monitoring is proposed.

An artificial East Branch Wolf Creek dry stream reach at RMU 1.45 was created for Water Quality evaluation. No water quality requirements are necessary.

The TRC modelling show the 0.5-mg/L TRC BAT requirements with zero discharge as adequate.

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

Parameter	Limit (mg/l)	SBC	Model
BOD%	25	NA	25
Ammonia	25	NA	25
DO	4.0	NA	4.0

Comments: Modelling in stream DO affects the dry stream DO requirements.

Best Professional Judgment (BPJ) Limitations

Comments: Applies to DO only/

Anti-Backsliding

Not considered because of secondary treatment non-compliance

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
20C	34348	EAST BRANCH WOLF CREEK	**1.450**	1300.00	0.01	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	0.014	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
Hemlock MHP	PA0222160	0.0168	0.0168	0.0168	0.000	25.00	7.20

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
20C	34348	EAST BRANCH WOLF CREEK	1.010	1257.33	20.19	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	0.014	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
20C	34348	EAST BRANCH WOLF CREEK	**0.000**	1246.29	23.10	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	0.014	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 Hydrodynamic Outputs

SWP Basin	Stream Code	Stream Name
20C	34348	EAST BRANCH WOLF 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												
1.450	0.00	0.00	0.00	.0259	0.01837	.384	.81	2.11	0.08	0.322	24.97	7.20
1.010	0.28	0.00	0.28	.0259	0.00207	.463	12.66	27.36	0.05	1.198	20.43	7.01
Q1-10 Flow												
1.450	0.00	0.00	0.00	.0259	0.01837	NA	NA	NA	0.08	0.322	24.98	7.20
1.010	0.18	0.00	0.18	.0259	0.00207	NA	NA	NA	0.04	1.498	20.64	7.02
Q30-10 Flow												
1.450	0.00	0.00	0.00	.0259	0.01837	NA	NA	NA	0.08	0.321	24.96	7.20
1.010	0.37	0.00	0.37	.0259	0.00207	NA	NA	NA	0.06	1.022	20.32	7.01

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	95.00%	Use Balanced Technology	☑
D.O. Goal	5		

WQM 7.0 Wasteload Allocations

SWP Basin	Stream Code	Stream Name
20C	34348	EAST BRANCH WOLF 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
1.010	Hemlock	15.61	50	15.61	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
1.010	Hemlock	1.84	25	1.84	25	0	0

Dissolved Oxygen Allocations

RMI	Discharge Name	CBOD5		NH3-N		Dissolved Oxygen		Critical Reach	Percent Reduction
		Baseline (mg/L)	Multiple (mg/L)	Baseline (mg/L)	Multiple (mg/L)	Baseline (mg/L)	Multiple (mg/L)		
1.01	Hemlock	25	25	25	25	4	4	0	0

WQM 7.0 D.O.Simulation

SWP Basin	Stream Code	Stream Name
20C	34348	EAST BRANCH WOLF CREEK

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
1.010	0.017	20.430	7.013
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
12.655	0.463	27.361	0.052
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
3.98	0.495	2.24	0.724
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
7.878	12.513	Owens	5
Reach Travel Time (days)			
1.198			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.120	3.74	2.05	8.20
0.240	3.52	1.88	8.24
0.359	3.32	1.73	8.24
0.479	3.12	1.58	8.24
0.599	2.94	1.45	8.24
0.719	2.77	1.33	8.24
0.839	2.60	1.22	8.24
0.959	2.45	1.12	8.24
1.078	2.31	1.03	8.24
1.198	2.17	0.94	8.24

WQM 7.0 Effluent Limits

SWP Basin	Stream Code	Stream Name
20C	34348	EAST BRANCH WOLF 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)
1.010	Hemlock	PA0222160A	0.017	CBOD5	25		
				NH3-N	25	50	
				Dissolved Oxygen			4

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	95.00%	Use Balanced Technology	☑
D.O. Goal	5		

Wednesday, March 9, 2022 Version 1.1 Page 1 of 1

Proposed **Effluent Limitations and Monitoring**

WQM 7.0 Wasteload Allocations

SWP Basin	Stream Code	Stream Name
20C	34348	EAST BRANCH WOLF 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
1.450	Hemlock MHP	NA	50	9.08	50	0	0
1.010		NA	NA	15.6	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
1.450	Hemlock MHP	NA	25	1.25	25	0	0
1.010		NA	NA	1.84	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)		
1.45	Hemlock MHP	25	25	25	25	5	5	0	0
1.01		NA	NA	NA	NA	NA	NA	NA	NA

Wednesday, March 9, 2022 Version 1.1 Page 1 of 1

Requirements

WQM 7.0 D.O.Simulation

SWP Basin	Stream Code	Stream Name
20C	34348	EAST BRANCH WOLF CREEK

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
1.450	0.017	24.974	7.199
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
0.811	0.384	2.109	0.084
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
24.88	1.499	24.87	1.026
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
5.017	27.150	Owens	NA
Reach Travel Time (days)			
0.322			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.032	23.42	24.06	3.06
0.064	22.04	23.28	2.41
0.097	20.74	22.52	2.30
0.129	19.52	21.79	2.40
0.161	18.38	21.08	2.59
0.193	17.30	20.40	2.80
0.225	16.28	19.74	3.02
0.257	15.32	19.10	3.24
0.290	14.42	18.48	3.45
0.322	13.57	17.88	3.65

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
1.010	0.017	20.430	7.014
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
12.655	0.463	27.361	0.052
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
3.00	0.325	1.54	0.724
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
7.846	12.513	Owens	5
Reach Travel Time (days)			
1.198			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.120	2.88	1.42	8.24
0.240	2.77	1.30	8.24
0.359	2.66	1.19	8.24
0.479	2.56	1.09	8.24
0.599	2.46	1.00	8.24
0.719	2.36	0.92	8.24
0.839	2.27	0.84	8.24
0.959	2.18	0.77	8.24
1.078	2.10	0.71	8.24
1.198	2.02	0.65	8.24

Wednesday, March 9, 2022 Version 1.1 Page 1 of 1

Th e limitations and monitoring requirements specified below are

WQM 7.0 Effluent Limits

SWP Basin	Stream Code	Stream Name
20C	34348	EAST BRANCH WOLF 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)
1.450	Hemlock MHP	PA0222160	0.017	CBOD5	25		
				NH3-N	25	50	
				Dissolved Oxygen			5

proposed for the draft permit, and reflect the most stringent limitations

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
20C	34348	EAST BRANCH WOLF CREEK	**0.000**	1246.29	23.10	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	0.014	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
20C	34348	EAST BRANCH WOLF CREEK	**1.010**	1257.33	20.19	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	0.014	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
Hemlock	PA0222160A	0.0168	0.0168	0.0168	0.000	25.00	7.19

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

WQM 7.0 Hydrodynamic Outputs

SWP Basin	Stream Code	Stream Name
20C	34348	EAST BRANCH WOLF 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												
1.010	0.28	0.00	0.28	.0259	0.00207	.463	12.66	27.36	0.05	1.198	20.43	7.01
Q1-10 Flow												
1.010	0.18	0.00	0.18	.0259	0.00207	NA	NA	NA	0.04	1.498	20.64	7.02
Q30-10 Flow												
1.010	0.37	0.00	0.37	.0259	0.00207	NA	NA	NA	0.06	1.022	20.32	7.01

amongst technology, water quality and BPJ. Instantaneous

WQM 7.0 D.O.Simulation

SWP Basin	Stream Code	Stream Name
20C	34348	EAST BRANCH WOLF CREEK

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
1.010	0.017	20.430	7.013
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
12.655	0.463	27.361	0.052
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
3.98	0.495	2.24	0.724
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
7.878	12.513	Owens	5
Reach Travel Time (days)			
1.198			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.120	3.74	2.05	8.20
0.240	3.52	1.88	8.24
0.359	3.32	1.73	8.24
0.479	3.12	1.58	8.24
0.599	2.94	1.45	8.24
0.719	2.77	1.33	8.24
0.839	2.60	1.22	8.24
0.959	2.45	1.12	8.24
1.078	2.31	1.03	8.24
1.198	2.17	0.94	8.24

(conventional pollutants) or 2.5 (toxic pollutants). Sample

WQM 7.0 Wasteload Allocations

SWP Basin	Stream Code	Stream Name
20C	34348	EAST BRANCH WOLF 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
1.010	Hemlock	15.61	50	15.61	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
1.010	Hemlock	1.84	25	1.84	25	0	0

Dissolved Oxygen Allocations

RMI	Discharge Name	CBOD5		NH3-N		Dissolved Oxygen		Critical Reach	Percent Reduction
		Baseline (mg/L)	Multiple (mg/L)	Baseline (mg/L)	Multiple (mg/L)	Baseline (mg/L)	Multiple (mg/L)		
1.01	Hemlock	25	25	25	25	4	4	0	0

frequencies and types are derived from the “NPDES Permit Writer’s

WQM 7.0 Effluent Limits

SWP Basin	Stream Code	Stream Name
20C	34348	EAST BRANCH WOLF 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)
1.010	Hemlock	PA0222160A	0.017	CBOD5	25		
				NH3-N	25	50	
				Dissolved Oxygen			4

Manual" (362-0400-001), SOPs and/or BPJ.

	Discharger	John Chrzanowski							Monday, July 25, 2022			
	Site	Hemlock MHP						Revised	Monday, July 25, 2022			
	Municipality	Wolf Creek Township										
	County	Butler										
	NPDES Permit	PA0222160										
	0.5											
				TRC EVALUATION								
	Input appropriate values in B4:B8 and E4:E7											
	0.2747	**= Q stream (cfs)**			**0.5**	**= CV Daily**						
	0.0250	**= 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)**						
		= BAT/BPJ Value			**720**	**= CFC_Criteria Compliance Time (min)**						
	0	**= % Factor of Safety (FOS)**				**=Decay Coefficient (K)**						
	Source	Reference	λFC Calculations			Reference	CFC Calculations					
	TRC	**1.3.2.iii**	WLA afc = 2.285			**1.3.2.iii**	WLA cfc = 2.220					
	PENTOXSD TRG	**5.1a**	LTAMULT afc = 0.373			**5.1c**	LTAMULT cfc = 0.581					
	PENTOXSD TRG	**5.1b**	LTA_afc= 0.851			**5.1d**	LTA_cfc = 1.291					
	Source				Effluent Limit Calculations							
	PENTOXSD TRG	5.1f			AML MULT = 1.231							
	PENTOXSD TRG	5.1g			↓ LIMIT (mg/l) = 0.500		BAT/BPJ					
					(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)**

(0.011/EXP(-k*CFC_tc/1440))+(((CFC_Yc*Qs^0.011)/(1.547^Qd)....
...."EXP(-k*CFC_tc/1440)))+Xd+(CFC_Yc*Qs*Xs/1.547^Qd))*(1-FOS/100)

	Chlorine Required			=	perennial	Chlorine Demand	+ Chlorine Residual
Stream	Reach/Node			2	1	2	
Stream	Flow	Conditions			dry	perennial	
Stream	Code				unknown	34348	
	Function						
Samples					30	30	
reach	outfall		RMI		0.27	1.36	
	Reach End		RMI		0	0	
reach			feet		1425.6	7191.5712	
drainage			sq miles		0.01	20.19	
TRC	limitation	average	mg/L		0.009	0.500	
		maximum	mg/L		0.028	1.636	
elevation		modelled	feet		1300	1257.33	
elevation		modelled	feet		1257.33	1246.29	
slope		modelled	foot/foot		0.030	0.002	
low flow			cfs/sq mi		0.014	0.014	
discharge			mgd		0.0250	0.0250	
Runoff	Period		hours		24.000	24.000	

Dry stream discharge without aquatic life or need for aquatic life protection and rapid natural dechlorination. Downstream at perennial stream conditions no aquatic life protection is required and technology based requirements should suffice.

stream	flow		cfs	0.00014	0.27469
stream	flow		MGD	0.000088	0.177539
stream	flow	total	MGD	0.025088	0.202539
stream	chlorine	demand	mg/L	0.3	0.3
discharge	discharge	demand	mg/L		
stream	Total Stream/Waste		ratio	1.0	8.1

permitted	TRC	mean	BAT	0.5	0.5
permitted	TRC	maximum	BAT	1.6	1.6

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	Measured
pH (S.U.)	XXX	XXX	6.0 Inst Min	XXX	XXX	9.0	1/day	Grab
DO	XXX	XXX	4.0 Daily Min	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	50.0	2/month	Grab
TSS	XXX	XXX	XXX	30.0	XXX	60.0	2/month	Grab
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	XXX	XXX	XXX	Report	XXX	XXX	1/year	Grab
Total Nitrogen	XXX	XXX	XXX	Report	XXX	XXX	2/month	Grab
Ammonia	XXX	XXX	XXX	Report	XXX	XXX	2/month	Grab
Total Phosphorus	XXX	XXX	XXX	Report	XXX	XXX	2/month	Grab

Compliance Sampling Location: Outfall 001 after disinfection.