pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Southcentral Regional Office
CLEAN WATER PROGRAM

Application Type	**Renewal**	Application No.	**PA0081710**
Facility Type	**Non-Municipal**	APS ID	**700241**
Major / Minor	**Minor**	Authorization ID	**1434670**

NPDES PERMIT FACT SHEET
INDIVIDUAL SEWAGE

Applicant and Facility Information

Applicant Name	**MHC Circle M, LP**	Facility Name	**Circle M Campground**
Applicant Address	2 N Riverside Plaza, Suite 800	Facility Address	2111 Millersville Road
	Chicago, IL 60606-2682		Lancaster, PA 17603
Applicant Contact	Greggory Kane	Facility Contact	Linda Coterwas
Applicant Phone	(312) 279-1400	Facility Phone	(717) 872-4651
Client ID	275112	Site ID	452728
Ch 94 Load Status	Not Overloaded	Municipality	Pequea Township
Connection Status	No Limitations	County	Lancaster
Date Application Received	March 29, 2023	EPA Waived?	Yes
Date Application Accepted	April 13, 2023	If No, Reason	

Purpose of Application: NPDES Renewal.

Summary of Review

MHC Circle M, LP has applied to the Pennsylvania Department of Environmental Protection (DEP) for reissuance of its National Pollutant Discharge Elimination System (NPDES) permit. The existing permit was issued on September 27, 2018, and became effective on October 1, 2018, authorizing discharge of treated sewage from the Circle M Campground WWTP into the Conestoga River. The existing permit expiration date was September 30, 2023, and the permit has been administratively extended since that time.

Changes in this renewal: E. Coli monitoring has been added to the permit.

Sludge use and disposal description and location(s): Sludge holding tank with offsite disposal

Supplemental information for this facility is provided at the end of this fact sheet.

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		Benjamin R. Lockwood Benjamin R. Lockwood / Environmental Engineering Specialist	January 31, 2024
X		Maria D. Bebenek for Daniel W. Martin, P.E. / Environmental Engineer Manager	February 1, 2024

Discharge, Receiving Waters and Water Supply Information

Outfall No.	001	Design Flow (MGD)	.06
Latitude	40º 0' 37.94"	Longitude	76º 19' 38.95"
Quad Name		Quad Code	
Wastewater Description:	Sewage Effluent		
Receiving Waters	Conestoga River (WWF)	Stream Code	7548
NHD Com ID	57465227	RMI	12.2
Drainage Area	390 mi^2	Yield (cfs/mi^2)	0.149
Q_{7-10} Flow (cfs)	58	Q_{7-10} Basis	USGS PA StreamStats
Elevation (ft)	215	Slope (ft/ft)	
Watershed No.	7-J	Chapter 93 Class.	WWF
Existing Use	N/A	Existing Use Qualifier	N/A
Exceptions to Use	N/A	Exceptions to Criteria	N/A
Assessment Status	Impaired		
Cause(s) of Impairment	Pathogens		
Source(s) of Impairment	Agriculture, Urban Runoff/Storm Sewers		
TMDL Status	N/A	Name	N/A
Nearest Downstream Public Water Supply Intake	PPL Holtwood Electric Plant		
PWS Waters	Susquehanna River	Flow at Intake (cfs)	
PWS RMI		Distance from Outfall (mi)	21.5

Changes Since Last Permit Issuance: USGS PA StreamStats provided a drainage area of 390 mi^2 and a Q_{7-10} flow of 58 cfs at the point of discharge.

Other Comments: None

Treatment Facility Summary				
Waste Type	**Degree of Treatment**	**Process Type**	**Disinfection**	**Avg Annual Flow (MGD)**
Sewage	Secondary	Extended Aeration	Chlorine Tablets	0.06
Hydraulic Capacity (MGD)	**Organic Capacity (lbs/day)**	**Load Status**	**Biosolids Treatment**	**Biosolids Use/Disposal**
0.06		Not Overloaded	Sludge Holding Tank	Other WWTP

Changes Since Last Permit Issuance: None

Other Comments: The treatment process is as follows: Bar Screen, 3 Equalization Tanks, Distribution Box, 2 Treatment Trains consisting of 4 Aeration Tanks and a Clarifier Tank, Sludge Holding Tank, Chlorine Tablet Feeder and Chlorine Contact Tank, Outfall 001 to the Conestoga River.

Compliance History	
Summary of DMRs:	A summary of the past 12-month DMR effluent data is present on the next page of this fact sheet.
Summary of Inspections:	6/13/2019: A routine inspection was conducted. 4 pump stations convey wastewater to the WWTP; they were observed during the inspection. It was requested that the Applicant maintain a log of pump station monitoring, and regularly clean and check the alarms. An accumulation of rags was present in the eastern EQ chamber. The WWTP effluent appeared clear with a slight yellow tint. Field results were within permitted limits. 5/13/2020: An administrative inspection was conducted. All treatment units were online and operable. There were not outstanding issues or needs at the time.

Other Comments: There are no open violations for this Applicant.

Compliance History

DMR Data for Outfall 001 (from December 1, 2022 to November 30, 2023)

Parameter	NOV-23	OCT-23	SEP-23	AUG-23	JUL-23	JUN-23	MAY-23	APR-23	MAR-23	FEB-23	JAN-23	DEC-22
Flow (MGD) Average Monthly	0.001387	0.00828	0.00925	0.01059	0.01613	0.01398	0.00751	0.00676	0.00191	0.00187	0.00158	0.00062
Flow (MGD) Daily Maximum	0.00921	0.01569	0.01776	0.02291	0.0336	0.02927	0.01653	0.01669	0.00798	0.00827	0.00581	0.00304
pH (S.U.) Instantaneous Minimum	7.8	7.7	7.7	7.7	7.7	7.7	7.7	7.8	7.9	8.1	7.9	8.0
pH (S.U.) Instantaneous Maximum	8.1	8.0	8.1	8.0	8.0	8.1	8.1	8.4	8.4	8.3	8.3	8.3
DO (mg/L) Instantaneous Minimum	7.4	8.0	7.1	6.9	6.7	7.3	7.3	7.8	10.8	10.8	12.2	8.7
TRC (mg/L) Average Monthly	0.2	0.3	0.4	0.4	0.4	0.3	0.5	0.3	0.2	0.2	0.2	0.1
TRC (mg/L) Instantaneous Maximum	0.86	1.02	1.37	1.41	1.41	1.47	0.97	0.98	0.57	0.74	0.87	0.49
CBOD5 (mg/L) Average Monthly	< 2.4	< 2.4	< 2.4	< 2.4	< 2.4	< 2.4	< 2.4	< 5.9	< 2.4	< 2.4	< 2.4	< 2.4
TSS (mg/L) Average Monthly	2.0	1.5	3.0	2.0	1.5	3.0	2.5	8.5	6.5	8.5	12.0	5.5
Fecal Coliform (No./100 ml) Average Monthly	< 1	< 1	< 1	< 2	< 1	< 1	< 1	> 49	< 1	< 1	< 1	< 1
Fecal Coliform (No./100 ml) Instantaneous Maximum	< 1	< 1	< 1	6	< 1	< 1	< 1	> 2420	< 1	< 1	1	< 1
Nitrate-Nitrite (lbs/day) Annual Average												7
Nitrate-Nitrite (mg/L) Annual Average												67.6
Total Nitrogen (lbs/day) Annual Average												< 7

Total Nitrogen (mg/L) Annual Average												< 68.1
Ammonia (lbs/day) Annual Average												0.02
Ammonia (mg/L) Annual Average												0.2
TKN (lbs/day) Annual Average												< 0.05
TKN (mg/L) Annual Average												< 0.5
Total Phosphorus (lbs/day) Average Monthly	0.02	< 0.04	0.1	0.1	0.2	0.1	0.08	0.03	0.004	0.009	0.003	0.0002
Total Phosphorus (mg/L) Average Monthly	1.1	< 0.4	1.0	0.9	0.9	0.8	0.7	0.5	0.6	1.1	1.3	0.7

Existing Effluent Limitations and Monitoring Requirements

The table below summarizes effluent limits and monitoring requirements implemented in the existing NPDES permit.

Outfall 001

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day)		Concentrations (mg/L)				Minimum Measurement Frequency	Required Sample Type
	Annual Average	Average Weekly	Minimum	Average Monthly	Maximum	Instant. Maximum		
Flow (MGD)	Report Avg Mo	Report Daily Max	XXX	XXX	XXX	XXX	1/week	Measured
pH (S.U.)	XXX	XXX	6.0 Inst Min	XXX	XXX	9.0	1/day	Grab
Dissolved Oxygen	XXX	XXX	5.0 Inst Min	XXX	XXX	XXX	1/day	Grab
Total Residual Chlorine (TRC)	XXX	XXX	XXX	0.5	XXX	1.6	1/day	Grab
Carbonaceous Biochemical Oxygen Demand (CBOD5)	XXX	XXX	XXX	25.0	XXX	50	2/month	24-Hr Composite
Total Suspended Solids	XXX	XXX	XXX	30.0	XXX	60	2/month	24-Hr Composite
Fecal Coliform (No./100 ml) Oct 1 - Apr 30	XXX	XXX	XXX	2000	XXX	10000	2/month	Grab
Fecal Coliform (No./100 ml) May 1 - Sep 30	XXX	XXX	XXX	200	XXX	1000	2/month	Grab
Nitrate-Nitrite as N	Report	XXX	XXX	Report Annl Avg	XXX	XXX	1/year	24-Hr Composite
Total Nitrogen	Report	XXX	XXX	Report Annl Avg	XXX	XXX	1/year	Calculation
Ammonia-Nitrogen	Report	XXX	XXX	Report Annl Avg	XXX	XXX	1/year	24-Hr Composite
Total Kjeldahl Nitrogen	Report	XXX	XXX	Report Annl Avg	XXX	XXX	1/year	24-Hr Composite
Total Phosphorus	Report Avg Mo	XXX	XXX	2.0	XXX	4	2/month	24-Hr Composite

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s):

at Outfall 001

Development of Effluent Limitations

Outfall No. 001 **Design Flow (MGD)** .06
Latitude 40º 0' 37.94" **Longitude** 76º 19' 38.95"
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)

Water Quality-Based Limitations

$CBOD_5$, NH_3-N

Pursuant to 40 CFR § 122.44(d)(1)(i), more stringent requirements should be considered when pollutants are discharged at the levels which have the reasonable potential to cause or contribute to excursions above water quality standards.

WQM 7.0 ver. 1.1b is a water quality model designed to assist DEP in determining appropriate water quality based effluent limits (WQBELs) for carbonaceous biochemical oxygen demand ($CBOD_5$), ammonia (NH_3-N) and dissolved oxygen (D.O.). DEP's Technical Guidance No. 391-2000-007 provides the technical methods contained in WQM 7.0 for determining wasteload allocations and for determining recommended NPDES effluent limits for point source discharges. The model was utilized for this permit renewal. The model output indicated a $CBOD_5$ average monthly limit of 25 mg/l, an NH_3-N average monthly limit of 25 mg/l, and a D.O. minimum limit of 5.0 mg/l were protective of water quality. The flow data used to run the model was acquired from USGS PA StreamStats and is included as an attachment. The $CBOD_5$ limit of 25 mg/l is the same as the existing permit limit, and will remain. The existing permit contains NH_3-N monitoring. SOP No. BCW-PMT-033 (Establishing Effluent Limitations for Individual Sewage Permits) recommends, for existing discharges, a year-round monitoring requirement for ammonia-nitrogen at a minimum when WQM modeling results for summer indicates that an average monthly limit of 25 mg/L is acceptable. Therefore, the monitoring requirement for NH_3-N in the permit will remain.

There are no industrial/commercial users contributing industrial wastewater to the system and MHC Circle M, LP does not currently have an EPA-approved pretreatment program. Accordingly, evaluating reasonable potential of toxic pollutants is not necessary as effluent levels of toxic pollutants are expected to be insignificant.

Additional Considerations

Chesapeake Bay Total Maximum Daily Load (TMDL)

DEP developed a strategy to comply with the EPA and Chesapeake Bay Foundation requirements by reducing point source loadings of Total Nitrogen (TN) and Total Phosphorus (TP). This strategy can be located in the *Pennsylvania Chesapeake Watershed Implementation Plan* (WIP), dated January 11, 2011. Subsequently, an update to the WIP was published as the Phase 2 WIP. As part of the Phase 2 WIP, a *Phase 2 Watershed Implementation Plan Wastewater Supplement* (Phase 2

Supplement) was developed, providing an update on TMDL implementation for point sources and DEP's current implementation strategy for wastewater. A new update to the WIP was published as the Phase 3 WIP in August 2019. As part of the Phase 3 WIP, a *Phase 3 Watershed Implementation Plan Wastewater Supplement* (Phase 3 Supplement) was developed, and was most recently revised on December 17, 2019, and is the basis for the development of any Chesapeake Bay related permit parameters. Sewage discharges have been prioritized based on their design flow to the Bay. The highest priority (Phases 1, 2, and 3) dischargers will receive annual Cap Loads based on their design flow on August 29, 2005 and concentrations of 6 mg/l TN and 0.8 mg/l TP. These limits may be achieved through a combination of treatment technology, credits, or offsets. For Phase 4 and 5 facilities, Cap Loads are not currently being implemented for renewed or amended permits for facilities that do not increase design flow.

This facility is considered a Phase 5 non-significant facility with a design flow less than 0.2 MGD but greater than 0.002 MGD. According to the Phase 3 WIP, TN and TP monitoring is recommended for this facility, which is consistent with the existing permit.

Total Phosphorus

For Total Phosphorus (TP), the current NPDES permit requires the permittee to comply with average monthly and IMAX limits of 2.0 mg/L and 4 mg/L, respectively. Previously, DEP's Implementation Guidance for Section 95.9 Phosphorus Discharges to Free Flowing Streams (Guidance No. 391-2000-018) was used to evaluate if phosphorus limitations were necessary. According to the guidance, phosphorus limits would be needed if contributions from this facility exceeded 0.25% of the total phosphorus load of all discharges in the Lower Susquehanna River Basin. It was previously determined that this facility exceeded 0.25% of the total phosphorus load, and a TP limit of 2.0 mg/l was included in the permit. The existing TP limit of 2.0 mg/l will remain unchanged in the permit to protect the Lower Susquehanna River.

Dissolved Oxygen

A minimum D.O. limit of 5.0 mg/L is a D.O. water quality criterion found in 25 Pa. Code § 93.7(a). This limit is included in the existing NPDES permit based BPJ. It is still recommended to include this limit in the draft permit to ensure that the facility continues to achieve compliance with DEP water quality standards.

Fecal Coliform

PA Code § 92a.47.(a)(4) requires a monthly average limit of 200/100 mL as a geometric mean and an instantaneous maximum limit not greater than 1,000/100 mL from May through September for fecal coliform. PA Code § 92a.47.(a)(5) requires a monthly average limit of 2,000/100 mL as a geometric mean and an instantaneous maximum limit not greater than 10,000/100 mL from October through April for fecal coliform. These limits are consistent with the existing permit requirements.

E. Coli

PA Code § 92a.61 requires IMAX reporting of E. Coli. Per DEP's SOP No. BCW-PMT-033, sewage dischargers with a design flow of 0.002 – 0.05 mgd will include E. Coli monitoring with a frequency of 1/year. This parameter has been added to the renewal permit.

Total Residual Chlorine

The attached computer printout utilizes the equations and calculations as presented in the Department's May 1, 2003 Implementation Guidance for Total Residual Chlorine (TRC) (ID No. 391-2000-015) for developing chlorine limitations. The Guidance references Chapter 92, Section 92.2d (3) which establishes a standard BAT limit of 0.5 mg/l unless a facility-specific BAT has been developed. The attached printout indicates that a water quality limit of 0.5 mg/l would be needed to prevent toxicity concerns. This is the same as the existing permit limit; therefore, a TRC limit of 0.5 mg/l monthly average and 1.6 mg/l instantaneous maximum will remain in the permit.

Sampling Frequency & Sample Type

The monitoring requirements were established based on BPJ and/or Table 6-3 of DEP's Technical Guidance No. 362-0400-001.

Anti-Degradation

The effluent limits for this discharge have been developed to ensure that existing instream water uses and the level of water quality necessary to protect the existing uses are maintained and protected. No High Quality Waters are impacted by this discharge. No Exceptional Value Waters are impacted by this discharge.

303(d) Listed Streams

The discharge is located on a stream segment that is designated on the 303(d) list as impaired. There is a recreational impairment for agriculture and urban runoff/storm sewers due to pathogens.

Class A Wild Trout Fisheries

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

Anti-Backsliding

Pursuant to 40 CFR § 122.44(l)(1), all proposed permit requirements addressed in this fact sheet are at least as stringent as the requirements implemented in the existing NPDES permit unless any exceptions are addressed by DEP in this fact sheet.

Proposed Effluent Limitations and Monitoring Requirements

The limitations and monitoring requirements specified below are proposed for the draft permit, and reflect the most stringent limitations amongst technology, water quality and BPJ. Instantaneous Maximum (IMAX) limits are determined using multipliers of 2 (conventional pollutants) or 2.5 (toxic pollutants). Sample frequencies and types are derived from the "NPDES Permit Writer's Manual" (386-0400-001), SOPs and/or BPJ.

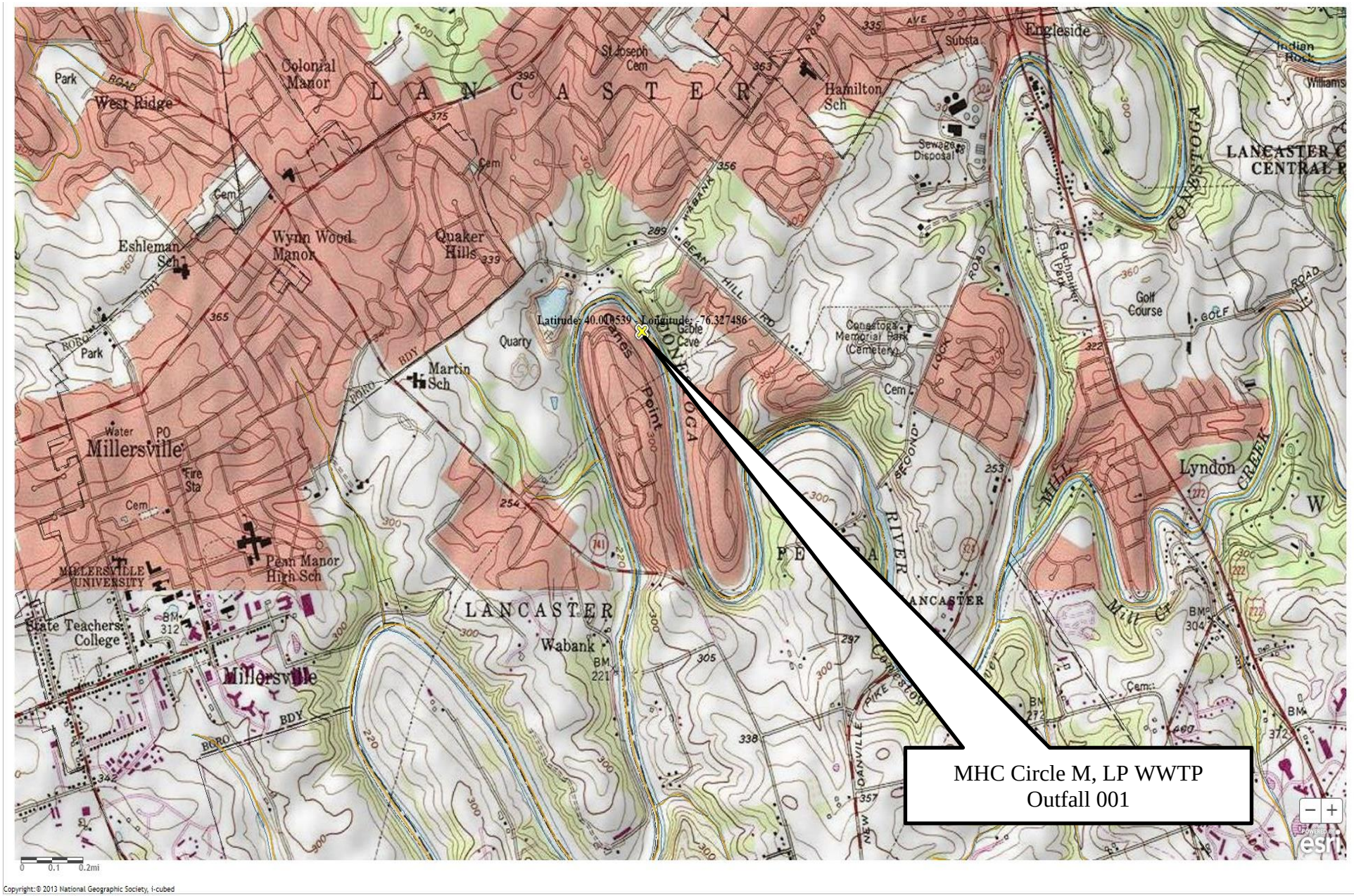
Outfall 001, Effective Period: Permit Effective Date through Permit Expiration Date.

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

Compliance Sampling Location: Outfall 001

Other Comments: None

Tools and References Used to Develop Permit	
☒	WQM for Windows Model (see Attachment)
☐	Toxics Management Spreadsheet (see Attachment)
☒	TRC Model Spreadsheet (see Attachment)
☐	Temperature Model Spreadsheet (see Attachment)
☐	Water Quality Toxics Management Strategy, 361-0100-003, 4/06.
☒	Technical Guidance for the Development and Specification of Effluent Limitations, 386-0400-001, 10/97.
☐	Policy for Permitting Surface Water Diversions, 386-2000-019, 3/98.
☐	Policy for Conducting Technical Reviews of Minor NPDES Renewal Applications, 386-2000-018, 11/96.
☐	Technology-Based Control Requirements for Water Treatment Plant Wastes, 386-2183-001, 10/97.
☐	Technical Guidance for Development of NPDES Permit Requirements Steam Electric Industry, 386-2183-002, 12/97.
☐	Pennsylvania CSO Policy, 386-2000-002, 9/08.
☐	Water Quality Antidegradation Implementation Guidance, 391-0300-002, 11/03.
☐	Implementation Guidance Evaluation & Process Thermal Discharge (316(a)) Federal Water Pollution Act, 386-2000-008, 4/97.
☒	Determining Water Quality-Based Effluent Limits, 386-2000-004, 12/97.
☐	Implementation Guidance Design Conditions, 386-2000-007, 9/97.
☒	Technical Reference Guide (TRG) WQM 7.0 for Windows, Wasteload Allocation Program for Dissolved Oxygen and Ammonia Nitrogen, Version 1.0, 386-2000-016, 6/2004.
☐	Interim Method for the Sampling and Analysis of Osmotic Pressure on Streams, Brines, and Industrial Discharges, 386-2000-012, 10/1997.
☐	Implementation Guidance for Section 95.6 Management of Point Source Phosphorus Discharges to Lakes, Ponds, and Impoundments, 386-2000-009, 3/99.
☐	Technical Reference Guide (TRG) PENTOXSD for Windows, PA Single Discharge Wasteload Allocation Program for Toxics, Version 2.0, 386-2000-015, 5/2004.
☐	Implementation Guidance for Section 93.7 Ammonia Criteria, 386-2000-022, 11/97.
☐	Policy and Procedure for Evaluating Wastewater Discharges to Intermittent and Ephemeral Streams, Drainage Channels and Swales, and Storm Sewers, 386-2000-013, 4/2008.
☐	Implementation Guidance Total Residual Chlorine (TRC) Regulation, 386-2000-011, 11/1994.
☐	Implementation Guidance for Temperature Criteria, 386-2000-001, 4/09.
☐	Implementation Guidance for Section 95.9 Phosphorus Discharges to Free Flowing Streams, 386-2000-021, 10/97.
☐	Implementation Guidance for Application of Section 93.5(e) for Potable Water Supply Protection Total Dissolved Solids, Nitrite-Nitrate, Non-Priority Pollutant Phenolics and Fluorides, 386-2000-020, 10/97.
☐	Field Data Collection and Evaluation Protocol for Determining Stream and Point Source Discharge Design Hardness, 386-2000-005, 3/99.
☐	Implementation Guidance for the Determination and Use of Background/Ambient Water Quality in the Determination of Wasteload Allocations and NPDES Effluent Limitations for Toxic Substances, 386-2000-010, 3/1999.
☐	Design Stream Flows, 386-2000-003, 9/98.
☐	Field Data Collection and Evaluation Protocol for Deriving Daily and Hourly Discharge Coefficients of Variation (CV) and Other Discharge Characteristics, 386-2000-006, 10/98.
☐	Evaluations of Phosphorus Discharges to Lakes, Ponds and Impoundments, 386-3200-001, 6/97.
☐	Pennsylvania's Chesapeake Bay Tributary Strategy Implementation Plan for NPDES Permitting, 4/07.
☒	SOP: BCW-PMT-033
☐	Other:


Latitude: 40.001539 , Longitude: -76.327486
MHC Circle M, LP WWTP
Outfall 001
LANCASTER
Millersville
Wabank
Quaker Hills
Wynn Wood Manor
Colonial Manor
West Ridge
Eshleman Sch
Martin Sch
Penn Manor High Sch
State Teachers College
Engleside
Hamilton Sch
Sewage Disposal
Golf Course
Conestoga Memorial Park (Cemetery)
Quarry
Gable Cave
Lyndon
Indian Rock
Williams
Fire Sta
Water
PO
Cem
Park
Substa
St Joseph Cem
Buchanan Park
Lock
Second
Mill Ct
New Danville Pike
Conestoga River
Lancaster Central
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MHC Circle M, LP Outfall 001 RMI = 12.2

Region ID: PA
Workspace ID: PA20240131131036243000
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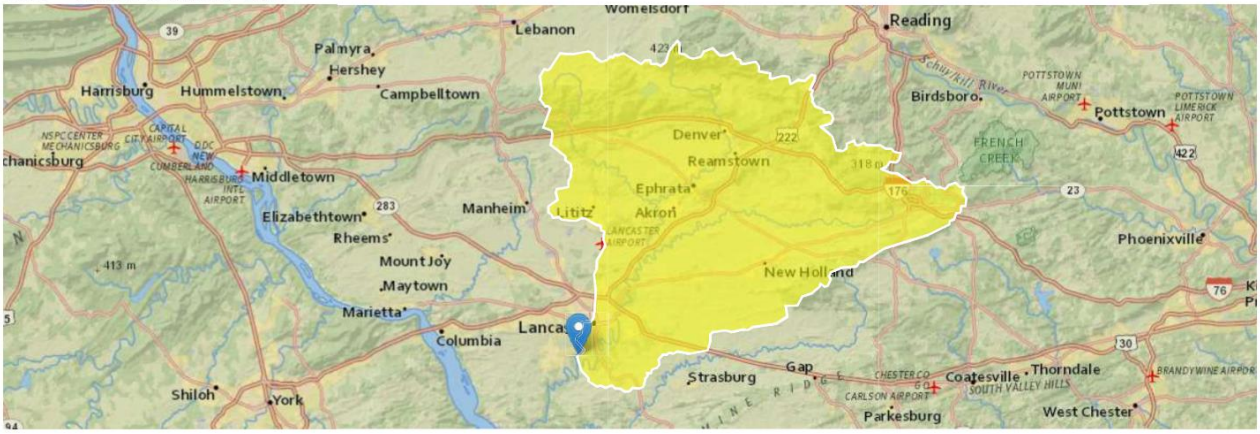
Time: 2024-01-31 08:10:57 -0500



Collapse All

Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
BSLOPD	Mean basin slope measured in degrees	4.099	degrees
DRNAREA	Area that drains to a point on a stream	390	square miles
ROCKDEP	Depth to rock	5	feet
URBAN	Percentage of basin with urban development	9.4137	percent

Low-Flow Statistics

Low-Flow Statistics Parameters [Low Flow Region 1]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	390	square miles	4.78	1150
BSLOPD	Mean Basin Slope degrees	4.099	degrees	1.7	6.4
ROCKDEP	Depth to Rock	5	feet	4.13	5.21
URBAN	Percent Urban	9.4137	percent	0	89

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

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

Statistic	Value	Unit	SE	ASEp
7 Day 2 Year Low Flow	101	ft^3/s	46	46
30 Day 2 Year Low Flow	126	ft^3/s	38	38
7 Day 10 Year Low Flow	58	ft^3/s	51	51
30 Day 10 Year Low Flow	71.4	ft^3/s	46	46
90 Day 10 Year Low Flow	105	ft^3/s	41	41

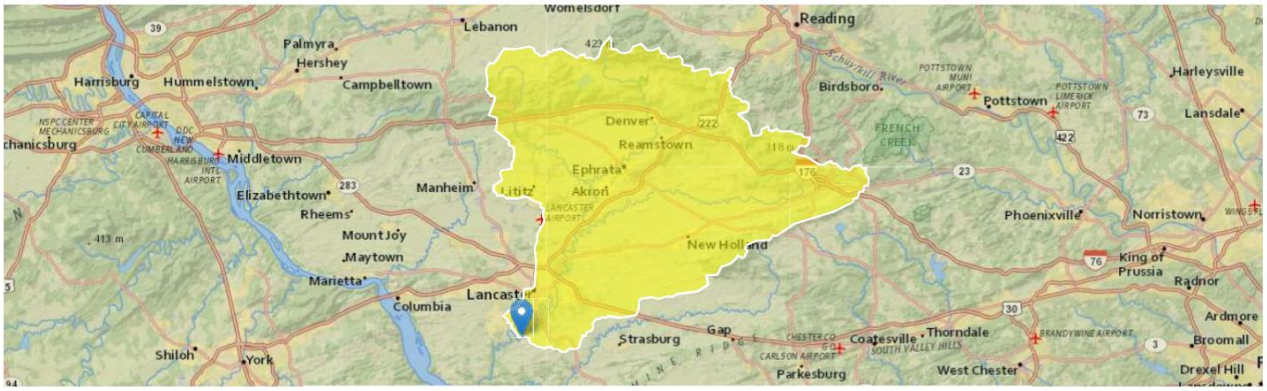
Low-Flow Statistics Citations

Stuckey, M.H.,2006, Low-flow, base-flow, and mean-flow regression equations for Pennsylvania streams: U.S. Geological Survey Scientific Investigations Report 2006-5130, 84 p. (http://pubs.usgs.gov/sir/2006/5130/)

Application Version: 4.19.3
StreamStats Services Version: 1.2.22
NSS Services Version: 2.2.1

MHC Circle M, LP Downstream Point RMI = 10.48

Region ID: PA
Workspace ID: PA20240131131616749000
Clicked Point (Latitude, Longitude): 39.99131, -76.32679
Time: 2024-01-31 08:16:37 -0500



Collapse All

Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
BSLOPD	Mean basin slope measured in degrees	4.1019	degrees
DRNAREA	Area that drains to a point on a stream	392	square miles
ROCKDEP	Depth to rock	5	feet
URBAN	Percentage of basin with urban development	9.4707	percent

Low-Flow Statistics

Low-Flow Statistics Parameters [Low Flow Region 1]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	392	square miles	4.78	1150
BSLOPD	Mean Basin Slope degrees	4.1019	degrees	1.7	6.4
ROCKDEP	Depth to Rock	5	feet	4.13	5.21
URBAN	Percent Urban	9.4707	percent	0	89

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

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

Statistic	Value	Unit	SE	ASEp
7 Day 2 Year Low Flow	101	ft^3/s	46	46
30 Day 2 Year Low Flow	127	ft^3/s	38	38
7 Day 10 Year Low Flow	58.4	ft^3/s	51	51
30 Day 10 Year Low Flow	72	ft^3/s	46	46
90 Day 10 Year Low Flow	106	ft^3/s	41	41

Low-Flow Statistics Citations

Stuckey, M.H.,2006, Low-flow, base-flow, and mean-flow regression equations for Pennsylvania streams: U.S. Geological Survey Scientific Investigations Report 2006-5130, 84 p. (http://pubs.usgs.gov/sir/2006/5130/)

Application Version: 4.19.3
StreamStats Services Version: 1.2.22
NSS Services Version: 2.2.1

TRC_CALC

1A	B	C	D	E	F	G
2	**TRC EVALUATION**					
3	Input appropriate values in B4:B8 and E4:E7					
4	58	= Q stream (cfs)		0.5	= CV Daily	
5	0.06	= Q discharge (MGD)		0.5	= CV Hourly	
6	30	= no. samples		1	= AFC_Partial Mix Factor	
7	0.3	= Chlorine Demand of Stream		1	= CFC_Partial Mix Factor	
8	0	= Chlorine Demand of Discharge		15	= AFC_Criteria Compliance Time (min)	
9	0.5	= BAT/BPJ Value		720	= CFC_Criteria Compliance Time (min)	
	0	= % Factor of Safety (FOS)			=Decay Coefficient (K)	
10	Source	Reference	AFC Calculations		Reference	CFC Calculations
11	TRC	1.3.2.iii	WLA afc = 199.351		1.3.2.iii	WLA cfc = 194.344
12	PENTOXSD TRG	5.1a	LTAMULT afc = 0.373		5.1c	LTAMULT cfc = 0.581
13	PENTOXSD TRG	5.1b	LTA_afc= 74.283		5.1d	LTA_cfc = 112.983
14						
15	Source		Effluent Limit Calculations			
16	PENTOXSD TRG	5.1f	AML MULT = 1.231			
17	PENTOXSD TRG	5.1g	AVG MON LIMIT (mg/l) = 0.500		BAT/BPJ	
18			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)**

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	7548	CONESTOGA RIVER (formerly CREE	**12.200**	215.00	390.00	0.00000	0.00	☑

Stream Data

Design Cond.	LFY (cfsm)	Trib Flow (cfs)	Stream Flow (cfs)	Rch Trav Time (days)	Rch Velocity (fps)	WD Ratio	Rch Width (ft)	Rch Depth (ft)	Tributary Temp (°C)	Tributary pH	Stream Temp (°C)	Stream pH
Q7-10	0.100	0.00	58.00	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
MHC Circle M	PA0081710	0.0600	0.0600	0.0600	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	5.00	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
07J	7548	CONESTOGA RIVER (formerly CREE	**10.480**	209.00	392.00	0.00000	0.00	☑

Stream Data

Design Cond.	LFY (cfsm)	Trib Flow (cfs)	Stream Flow (cfs)	Rch Trav Time (days)	Rch Velocity (fps)	WD Ratio	Rch Width (ft)	Rch Depth (ft)	Tributary Temp (°C)	Tributary pH	Stream Temp (°C)	Stream pH
Q7-10	0.100	0.00	58.40	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
07J	7548	CONESTOGA RIVER (formerly 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												
12.200	58.00	0.00	58.00	.0928	0.00066	1.013	123.33	121.71	0.46	0.226	20.01	7.00
Q1-10 Flow												
12.200	37.12	0.00	37.12	.0928	0.00066	NA	NA	NA	0.36	0.290	20.01	7.00
Q30-10 Flow												
12.200	78.88	0.00	78.88	.0928	0.00066	NA	NA	NA	0.55	0.190	20.01	7.00

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	5		

WQM 7.0 Wasteload Allocations

SWP Basin	Stream Code	Stream Name
07J	7548	CONESTOGA RIVER (formerly 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
12.200	MHC Circle M	16.74	50	16.74	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
12.200	MHC Circle M	1.89	25	1.89	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)		
12.20	MHC Circle M	25	25	25	25	5	5	0	0

WQM 7.0 D.O.Simulation

SWP Basin	Stream Code	Stream Name
07J	7548	CONESTOGA RIVER (formerly CREEK)

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
12.200	0.060	20.008	7.000
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
123.326	1.013	121.709	0.465
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
2.04	0.025	0.04	0.700
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
8.238	1.433	Tsivoglou	5
Reach Travel Time (days)			
0.226			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.023	2.04	0.04	8.24
0.045	2.03	0.04	8.24
0.068	2.03	0.04	8.24
0.090	2.03	0.04	8.24
0.113	2.03	0.04	8.24
0.136	2.03	0.04	8.24
0.158	2.03	0.04	8.24
0.181	2.03	0.04	8.24
0.203	2.03	0.03	8.24
0.226	2.03	0.03	8.24

WQM 7.0 Effluent Limits

SWP Basin	Stream Code	Stream Name
07J	7548	CONESTOGA RIVER (formerly 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)
12.200	MHC Circle M	PA0081710	0.060	CBOD5	25		
				NH3-N	25	50	
				Dissolved Oxygen			5