pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Southcentral Regional Office
CLEAN WATER PROGRAM

Application Type	**Renewal**	Application No.	**PA0081787**
Facility Type	**Non-Municipal**	APS ID	**277295**
Major / Minor	**Minor**	Authorization ID	**1183586**

NPDES PERMIT FACT SHEET INDIVIDUAL SEWAGE

Applicant and Facility Information

Applicant Name	**Telco Development Inc.**	Facility Name	**Gretna Springs MHP**
Applicant Address	5 Maple Avenue	Facility Address	5 Maple Avenue
	Manheim, PA 17545-8911		Manheim, PA 17545-8911
Applicant Contact	Earl Hurst	Facility Contact	Earl Hurst
Applicant Phone	(717) 272-1313	Facility Phone	(717) 272-1313
Client ID	65475	Site ID	445620
Ch 94 Load Status	Not Overloaded	Municipality	West Cornwall Township
Connection Status		County	Lebanon
Date Application Received	May 24, 2017	EPA Waived?	Yes
Date Application Accepted	June 8, 2017	If No, Reason	

Purpose of Application .

Summary of Review

1.0 General Discussion

This fact sheet supports the re-issuance of an existing NPDES permit for discharge of treated domestic wastewater from Telco Development (Gretna Springs) adult/retirement community wastewater treatment plant located in West Cornwall Township, Lebanon County. The adult/retirement community was planned to contain 211 residential units with original designed capacity for 0.528 MGD to be built in two phases. The first phase for 0.0264 MGD was constructed and is now believed to be able to handle the entire development. Careful observation of flows will need to be maintained to ensure adequate treatment capacity. Telco Developer Inc owns, and operates the wastewater treatment plant, which provides sanitary services for the adult/retirement community. The discharge goes to Chiques (Chickies) Creek which is classified for warm water fishes (WWF) and Migratory Fishes (MF). The existing NPDES permit was issued on November 28, 2012 with an effective date of December 1, 2012 and expiration date of November 30, 2017. The applicant submitted permit renewal application to the Department on May 24, 2017. The permittee is currently operating under the terms and conditions in the existing permit under administrative extension provisions pending Department action on the renewal application.

A topographic map showing the discharge location is presented in attachment A

1.1 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*,

Approve	Deny	Signatures	Date
X		J. Pascal Kwedza, P.E. / Environmental Engineer	July 18, 2019
		Daniel W. Martin, P.E. / Environmental Engineer Manager	
		Maria D. Bebenek, P.E. / Program Manager	

Summary of Review

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.

1.2 Changes to the existing Permit

- Monitoring for Total nitrogen, Nitrate-Nitrite, and TKN has been increased to semiannual to collect adequate data for the Chesapeake Bay Program.
- Ammonia-Nitrogen limit is more stringent

1.3 Existing Permit Limits and Monitoring Requirements

DISCHARGE LIMITATIONS							MONITORING REQUIREMENTS	
	Mass Units (lbs/day)		Concentrations (mg/l)					
Discharge Parameter	Average Monthly	Maximum Daily	Inst. Minimum	Average Monthly	Maximum Daily	Inst. Maximum	Monitoring Frequency	Sample Type
Flow (mgd)	Monitor & Report	Monitor & Report	XXX	XXX	XXX	XXX	continuous	Measured
pH (S.U.)	XXX	XXX	6.0	XXX	XXX	9.0	1/day	Grab
D.O.	XXX	XXX	5.0	XXX	XXX	XXX	1/day	Grab
Total Residual Chlorine	XXX	XXX	XXX	0.22	XXX	0.73	1/day	Grab
Total Suspended Solids	XXX	XXX	XXX	30	XXX	60	2/month	24-hour comp
$CBOD_5$	XXX	XXX	XXX	25	XXX	50	2/month	24-hour comp
Fecal Coliform (5/1 to 9/30)	XXX	XXX	XXX	200	XXX	1,000	2/month	Grab
Fecal Coliform (10/1 to 4/30)	XXX	XXX	XXX	2,000	XXX	10,000	2/month	Grab
Nitrate-Nitrite	XXX	XXX	XXX	Report	XXX	XXX	1/yr	24-hour comp
Total Nitrogen	XXX	XXX	XXX	Report	XXX	XXX	1/yr	Calculation
Ammonia Nov 1 - Apr 30	XXX	XXX	XXX	3.5	XXX	7.0	2/month	24-hour comp
Ammonia May 1 - Oct 31	XXX	XXX	XXX	10.5	XXX	21	2/month	24-hour comp
TKN	XXX	XXX	XXX	Report	XXX	XXX	1/yr	24-hour comp
Total Phosphorus	XXX	XXX	XXX	2.0	XXX	4.0	2/month	24-hour comp

1.4 Discharge, Receiving Waters and Water Supply Information

Outfall No.	001	Design Flow (MGD)	.0264
Latitude	40º 14' 49.96"	Longitude	-76º 26' 37.54"
Quad Name	Manheim	Quad Code	1734
Wastewater Description:	Sewage Effluent		

Receiving Waters	Chiques Creek	Stream Code	07919
NHD Com ID	57461967	RMI	28.6
Drainage Area	0.4 sq mi	Yield (cfs/mi^2)	
Q_{7-10} Flow (cfs)	0.06	Q_{7-10} Basis	USGS 01576500
Elevation (ft)		Slope (ft/ft)	
Watershed No.	7-G	Chapter 93 Class.	WWF, MF
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)		
Temperature (°F)		
Hardness (mg/L)		
Other:		

Nearest Downstream Public Water Supply Intake	Columbia Borough		
PWS Waters	Susquehanna	Flow at Intake (cfs)	3801
PWS RMI		Distance from Outfall (mi)	<41

Changes Since Last Permit Issuance:

Other Comments:

1.4.1 Water Supply Intake

The nearest water supply intake is 41 miles downstream at Columbia Borough, Lancaster County on the Susquehanna River by the Columbia Borough Water Company. No impact is expected from this discharge.

2.0 Treatment Facility Summary

Treatment Facility Name: Gretna Springs Adult Community

WQM Permit No.	Issuance Date

Waste Type	Degree of Treatment	Process Type	Disinfection	Avg Annual Flow (MGD)
Sewage	Secondary	Extended aeration	Hypochlorite	0.0264

Hydraulic Capacity (MGD)	Organic Capacity (lbs/day)	Load Status	Biosolids Treatment	Biosolids Use/Disposal
0.0264		Not Overloaded	Aerobic Digestion	

Changes Since Last Permit Issuance: None

2.1 Treatment Facility

Treatment units are:

- EQ tank
- 4 aeration tanks in series
- 2 clarifiers
- Tablet chlorinator w/CCT
- Tablet dechlorinator w/contact tank
- 2 sludge holding tanks

EQ tank receives wastewater from 2 pump stations, influent is pumped from EQ tank to the 1st of the 4 aeration tanks in series. Lime is manually added as needed to the 2nd aeration tank for pH control, Delpac is added to 3rd aeration tank at set daily dose, RAS to returned to 1st and 2nd aeration tanks. Effluent from the 4th aeration tank is divided equally to the two clarifiers. WAS is sent to 2 holding tanks. Chlorinated effluent goes through 2 contact tanks, dechlorinated at end of the 2nd contact tank prior to discharge. Pump stations have alarms, emergency generator powers plant community building and pump stations, 2 blowers for plant w/1 as back-up, 1 small blower for holding tanks, composite sampler uses peristaltic pump & can be set for 24 hr. sampling.

3.0 Compliance History

DMR Data for Outfall 001 (from June 1, 2018 to May 31, 2019)

Parameter	MAY-19	APR-19	MAR-19	FEB-19	JAN-19	DEC-18	NOV-18	OCT-18	SEP-18	AUG-18	JUL-18	JUN-18
Flow (MGD) Average Monthly	0.019	0.018	0.019	0.018	0.018	0.016	0.022	0.017	0.019	0.02	0.018	0.016
Flow (MGD) Daily Maximum	0.031	0.025	0.037	0.025	0.031	0.022	0.033	0.021	0.033	0.034	0.037	0.019
pH (S.U.) Minimum	7.27	7.22	7.24	7.30	7.32	7.2	7.16	7.41	7.43	7.33	7.36	6.93
pH (S.U.) Maximum	7.58	7.6	7.67	7.61	7.59	7.51	7.59	7.66	7.76	7.63	7.64	7.67
DO (mg/L) Minimum	8.2	8.8	8.6	10.10	9.9	8.2	7.80	7.7	7.3	7.2	7.1	6.70
TRC (mg/L) Average Monthly	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.02	0.02	0.02
TRC (mg/L) Instantaneous Maximum	0.08	0.07	0.05	0.07	0.08	0.07	0.06	0.09	0.09	0.04	0.04	0.03
CBOD5 (mg/L) Average Monthly	4	< 3	3	< 3	< 3	< 3	< 3	3	< 3	< 3	< 3	< 4
TSS (mg/L) Average Monthly	8	3	6	3	6	14	10	1	4	1	1	1
Fecal Coliform (CFU/100 ml) Geometric Mean	< 3	< 2	< 3	< 2	< 2	< 1	< 2	< 2	7	< 3	< 1	9
Fecal Coliform (CFU/100 ml) Instantaneous Maximum	4	< 2	4	< 2	< 2	< 2	< 2	< 2	8	6	< 2	22
Nitrate-Nitrite (lbs/day) Annual Average									< 3.7			
Nitrate-Nitrite (mg/L) Annual Average									< 27.4			
Total Nitrogen (lbs/day) Annual Average									< 3.7			
Total Nitrogen (mg/L) Annual Average									< 27.9			
Ammonia (mg/L) Average Monthly	< 0.3	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1

TKN (lbs/day) Annual Average									< 0.07			
TKN (mg/L) Annual Average									< 0.5			
Total Phosphorus (lbs/day) Annual Average									0.07			
Total Phosphorus (mg/L) Annual Average									0.53			
Total Phosphorus (mg/L) Average Monthly	0.40	0.3	0.5	0.32	0.48	0.47	0.6	0.56	0.55	0.67	0.6	0.51

3.2 Compliance History	
Summary of DMRs:	Discharge Monitoring Reports (DMRs) review for the facility for the last 12 months of operation presented on the table above indicate permit limits have been met consistently. No permit violation noted on DMRs during the period reviewed.
Summary of Inspections:	The facility was inspected 8 times during the past permit cycle. Inspection reports review for the facility during the period indicate permit limits have been met satisfactorily. The reports indicate good operation and maintenance of the facility. The facility has good compliance record

4.0 Development of Effluent Limitations

Outfall No. 001 **Design Flow (MGD)** .0264
Latitude 40º 14' 48.00" **Longitude** -76º 26' 37.00"
Wastewater Description: Sewage Effluent

4.1 Basis for Effluent Limitations

In general, the Clean Water Act(AWA) requires that the effluent limits for a particular pollutant be the more stringent of either technology-based limits or water quality-based limits. Technology-based limits are set according to the level of treatment that is achievable using available technology. A water quality-based effluent limit is designed to ensure that the water quality standards applicable to a waterbody are being met and may be more stringent than technology-based effluent limits.

4.1.1 Technology-Based Limitations

The following technology-based limitations apply, subject to water quality analysis and BPJ where applicable:

Pollutant	Limit (mg/l)	SBC	Federal Regulation	State Regulation
$CBOD_5$	25	Average Monthly	133.102(a)(4)(i)	92a.47(a)(1)
	40	Average Weekly	133.102(a)(4)(ii)	92a.47(a)(2)
Total Suspended Solids	30	Average Monthly	133.102(b)(1)	92a.47(a)(1)
	45	Average Weekly	133.102(b)(2)	92a.47(a)(2)
pH	6.0 – 9.0 S.U.	Min – Max	133.102(c)	95.2(1)
Fecal Coliform (5/1 – 9/30)	200 / 100 ml	Geo Mean	-	92a.47(a)(4)
Fecal Coliform (5/1 – 9/30)	1,000 / 100 ml	IMAX	-	92a.47(a)(4)
Fecal Coliform (10/1 – 4/30)	2,000 / 100 ml	Geo Mean	-	92a.47(a)(5)
Fecal Coliform (10/1 – 4/30)	10,000 / 100 ml	IMAX	-	92a.47(a)(5)
Total Residual Chlorine	0.5	Average Monthly	-	92a.48(b)(2)

Comments: Weekly averages are not applicable to this discharge

4.2 Water Quality-Based Limitations

4.2.1 Streamflows

Streamflows for the water quality analysis were determined by correlating with the yield of USGS gauging station No. Streamflow will be correlated with past streamflow records taken from the nearby USGS gage station on the Conestoga River at Lancaster City. Q_{7-10}, Q_{30-10}, and winter Q_{7-10} will be calculated by 0.16 cfs/mi^2, 1.27 and 1.17 x Q_{7-10}. Q_{1-10} will be calculated using a factor of 0.64 x Q_{7-10}, which was derived by Central Office in their February 1987 NH_3 Implementation Guidance. The drainage area at the discharge point taken from the previous protection report = 0.4 mi^2. The resulting streamflows at the point of first at the confluence of chickies creek are as follows:

Q_{7-10}	=	0.4 mi^2 x 0.16 cfs/mi^2	=	0.06 cfs
Q_{30-10}	=	0.06 cfs x 1.36	=	0.08cfs
Q_{7-10} (winter)	=	0.06 cfs x 1.17	=	0.07 cfs
Q_{1-10}	=	0.06 cfs x 0.64	=	0.04 cfs

NH_3N Calculations

NH_3N calculations will be based on the Department's Implementation Guidance of Section 93.7 Ammonia Criteria, dated 11/4/97 (ID #391-2000-013). The following data is necessary to determine the instream NH_3N criteria used in the attached computer model of the stream:

STP pH	=	7.36	(Taken from past DMRs between July – September)
STP Temp	=	25°C	(Default)
Stream pH	=	7.85	(Taken from the Chickies Creek WQN station at the stream mouth)
Stream Temp	=	20°C	(Taken from the Chickies Creek WQN station at the stream mouth)
Background NH_3N	=	0.0	(Assumed)

4.2.4 $CBOD_5$:

Gretna Springs MHP's discharge, the discharge from PA Dutch Country Golf course and the discharge from Pinch Pond Campground were modelled together due to their proximity to each other. The attached model result of WQM 7.0 stream model (attachment B) indicates that, for Gretna Springs' discharge of 0.026MGD, a limitation of 25 mg/l CBOD5 as a monthly average limit (AML) and 50 mg/l as instantaneous maximum (IMAX) is adequate to protect the water quality of the stream. This limit is consistent with the existing permit and the STP has been complying with this limitation. Therefore, a limit of 25mg/l AML, and 50 mg/l IMAX is again recommended for this permit cycle.

4.2.5 NH_3-N:

The attached model result of the WQM 7.0 stream model (attachment B) also indicates that a limitation of 2.5mg/l NH_3-N as a monthly average is necessary to protect the aquatic life from toxicity effects during the summer months. This limit is slightly more stringent than the existing permit, but the facility's DMR data indicate the facility can meet the new limit. Therefore, an average monthly summer limit of 2.5mg/l will be required in the permit. Winter months will have 3 times the summer limit(7.5mg/l)

4.2.6 Dissolved Oxygen

The existing permit contains a limit of 5 mg/l for Dissolved Oxygen (DO). DEP's Technical Guidance for the Development and Specification of Effluent Limitations (362-0400-001, 10/97) suggests that either the adopted minimum stream D.O. criteria for the receiving stream or the effluent level determined through water quality modeling be used for the limit. Since the WQM 7.0 model was run using a minimum D.O. of 5.0 mg/l, this limit will be continued in the renewed permit with a daily monitoring requirement per DEP guidance.

4.2.7 Total Suspended Solids(TSS):

There is no water quality criterion for TSS. A limit of 30 mg/l AML will be required based on the minimum level of effluent quality attainable by secondary treatment as defined in 40 CFR 133.102b(1) and 25 PA § 92a.47(a)(1)

4.2.8 Total Residual Chlorine:

The attached computer printout presented in attachment C utilizes the equations and calculations as presented in the Department's 2003 Implementation Guidance for Residual Chlorine (TRC) (ID # 391-2000-015) for developing chlorine limitations. The results presented in attachment C indicates that a water quality limit of 0.22 mg/l monthly average and IMAX of 0.73 mg/l would be needed to prevent toxicity concerns. The limitation recommended is consistent with the existing. DMR and inspection report indicate the facility is meeting the permit requirement.

4.2.9 Toxics

A reasonable potential (RP) analysis was done for pollutants in the discharge. The discharge consists entirely of domestic wastewater with no pollutants of concern that need further analysis.

4.2.10 Chesapeake Bay Strategy:

The Department formulated a strategy in April 2007, to comply with the EPA and Chesapeake Bay Foundation requirements to reduce point source loadings of Total Nitrogen (TN) and Total Phosphorus (TP) to the Bay. In the Strategy, sewage dischargers have been prioritized by Central Office based on their delivered TN loadings to the Bay. The highest priority (Phases 1, 2, and 3) dischargers will receive annual loading caps based on their design flow on August 29, 2005 and concentrations of 6 mg/l TN and 0.8 mg/l TP. Phase 4 (0.2 -0.4mgd) and Phase 5(below 0.2mdg) will be required to monitor and report TN and TP during permit renewal at a monitoring frequency following Table 6-3 of DEP's Technical Guidance for Development and Specification of effluent Limitations (No. 362-0400-001). Any facility in Phases 4 and 5 that undergoes expansion is subjected to cap load right away.

EPA published the Chesapeake Bay Total Maximum Daily Load (TMDL) in December of 2010. Despite extensive restoration efforts during the past 25 years, the TMDL was prompted by insufficient progress and continued poor water quality in the Chesapeake Bay and its tidal tributaries.

In order to address the TMDL, Pennsylvania developed in addition to the Bay Strategy, a Chesapeake Watershed Implementation Plan (WIP) Phase 1 in January 2011 and Phase 2 in March 2012. In accordance with the Phase 2 WIP and its supplement, re-issuing permits for significant dischargers follow the same phased approach formulated in the original Bay strategy, whilst Phase 4 and Phase 5 will be required to monitor and report TN and TP during permit renewal. This facility is, classified as a phase 5, and has been monitoring and will continue monitoring and reporting Nitrate-Nitrite as N, Total Kjeldahl Nitrogen and Total Nitrogen semi-annually throughout the next permit cycle. There is limitation on Total Phosphorus no monitoring is required

4.2.11 Phosphorus

The average monthly limit of 2mg/l phosphorus in the existing permit was based on the requirement to control phosphorus loading to Lower Susquehanna River Basin. That requirement has been superseded by the development of Chesapeake Bay TMDL in 2010, however due to anti-backsliding restrictions the limit will remain in the permit.

5.0 Other Requirements

5.1 Anti-backsliding

Not applicable to this permit

5.2 Stormwater:

No storm water outfall is associated with this facility

5.3 Biosolids Management

Sludge is hold up in 2 sludge holding tanks and hauled out by a licensed hauler (Klines) periodically to Manheim.

5.4 Anti-Degradation (93.4)

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.

5.5 Class A Wild Trout Fisheries

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

5.6 303d Listed Streams:

The discharge is not located on a 303d listed stream segment. The withdrawn 2001 Chickies Creek TMDL does not apply to this area of Chickies Creek.

5.7 Basis for Effluent and Surface Water Monitoring

Section 308 of the CWA and federal regulation 40 CFR 122.44(i) require monitoring in permits to determine compliance with effluent limitations. Monitoring may also be required to gather effluent and surface water data to determine if additional effluent limitations are required and/or to monitor effluent impacts on receiving water quality. The permittee is responsible for conducting the monitoring and for reporting results on Discharge Monitoring Reports (DMRs).

5.8 Effluent Monitoring

Monitoring frequencies are based on the nature and effect of the pollutant, as well as a determination of the minimum sampling necessary to adequately monitor the facility's performance. Permittees have the option of taking more frequent samples than are required under the permit. These samples can be used for averaging if they are conducted using EPA-approved test methods (generally found in 40 CFR 136) and if the Method Detection Limits are less than the effluent limits. The sampling location must be after the last treatment unit and prior to discharge to the receiving water. If no discharge occurs during the reporting period, "no discharge" shall be reported on the DMR.

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.

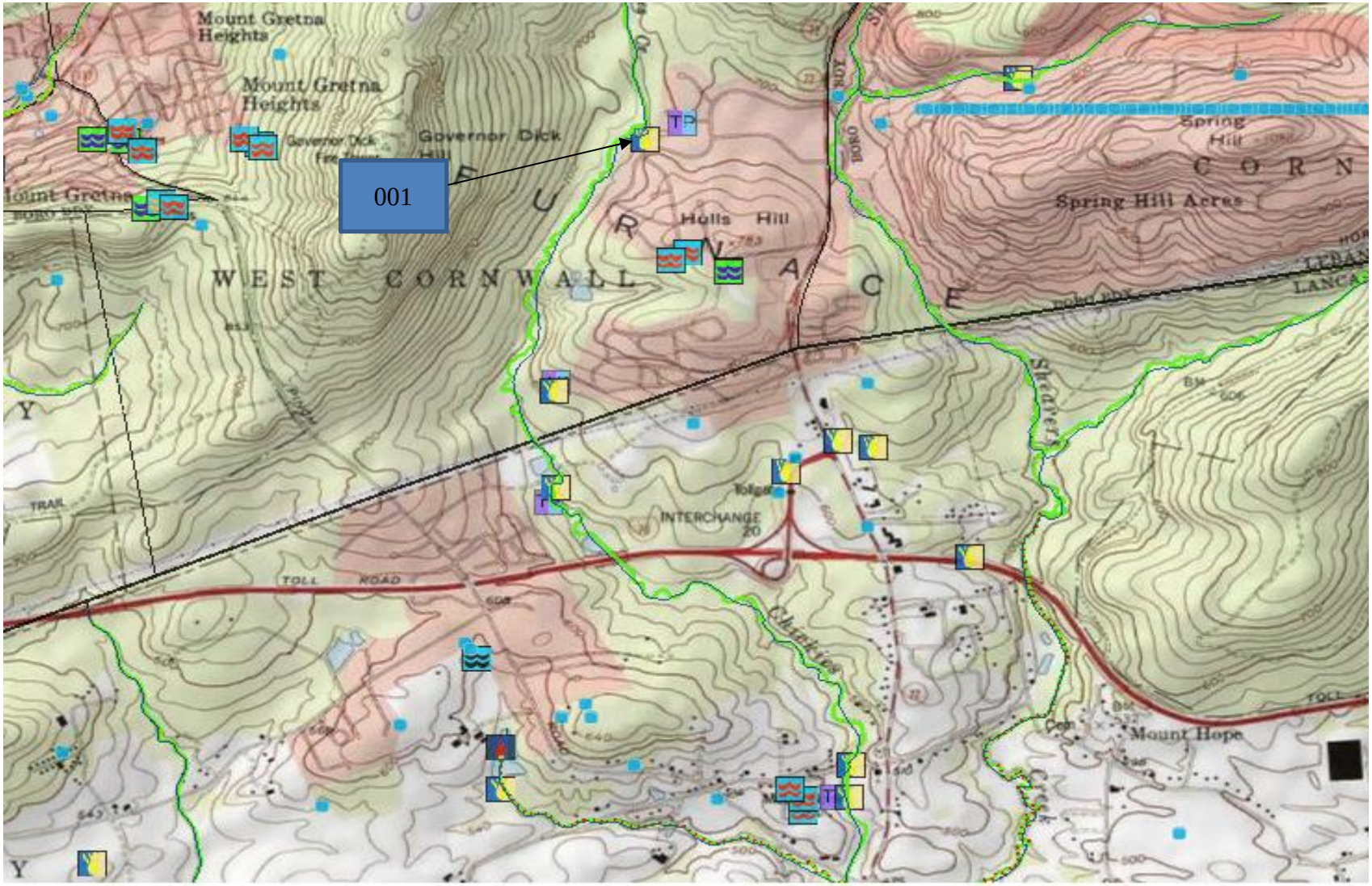
Parameter	Mass Units (lbs/day) (2)		Concentrations (mg/L)				Minimum (3) Measurement Frequency	Required Sample Type
	Average Monthly	Average Weekly	Minimum	Average Monthly	Maximum	Instant. Maximum		
Flow (MGD)	Report	Report Daily Max	XXX	XXX	XXX	XXX	Continuous	Measured
pH (S.U.)	XXX	XXX	6.0 Daily Min	XXX	9.0 Daily Max	XXX	1/day	Grab
DO	XXX	XXX	5.0	XXX	XXX	XXX	1/day	Grab
TRC	XXX	XXX	XXX	0.22	XXX	0.73	1/day	Grab
CBOD5	XXX	XXX	XXX	25	XXX	50	2/month	24-Hr Composite
TSS	XXX	XXX	XXX	30	XXX	60	2/month	24-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
Nitrate-Nitrite	XXX	XXX	XXX	XXX	Report Daily Max	XXX	1/6 months	24-Hr Composite
Total Nitrogen	XXX	XXX	XXX	XXX	Report Daily Max	XXX	1/6 months	Calculation
Ammonia Nov 1 - Apr 30	XXX	XXX	XXX	7.5	XXX	15	2/month	24-Hr Composite
Ammonia May 1 - Oct 31	XXX	XXX	XXX	2.5	XXX	5	2/month	24-Hr Composite
TKN	XXX	XXX	XXX	XXX	Report Daily Max	XXX	1/6 months	24-Hr Composite
Total Phosphorus	XXX	XXX	XXX	2.0	XXX	4	2/month	24-Hr Composite

Compliance Sampling Location: Outfall 001

7.0 Tools and References Used to Develop Permit	
☒	WQM for Windows Model (see Attachment **B**)
☐	PENTOXSD for Windows Model (see Attachment)
☒	TRC Model Spreadsheet (see Attachment **C**)
☐	Temperature Model Spreadsheet (see Attachment)
☐	Toxics Screening Analysis Spreadsheet (see Attachment)
☐	Water Quality Toxics Management Strategy, 361-0100-003, 4/06.
☐	Technical Guidance for the Development and Specification of Effluent Limitations, 362-0400-001, 10/97.
☐	Policy for Permitting Surface Water Diversions, 362-2000-003, 3/98.
☒	Policy for Conducting Technical Reviews of Minor NPDES Renewal Applications, 362-2000-008, 11/96.
☐	Technology-Based Control Requirements for Water Treatment Plant Wastes, 362-2183-003, 10/97.
☐	Technical Guidance for Development of NPDES Permit Requirements Steam Electric Industry, 362-2183-004, 12/97.
☐	Pennsylvania CSO Policy, 385-2000-011, 9/08.
☒	Water Quality Antidegradation Implementation Guidance, 391-0300-002, 11/03.
☐	Implementation Guidance Evaluation & Process Thermal Discharge (316(a)) Federal Water Pollution Act, 391-2000-002, 4/97.
☒	Determining Water Quality-Based Effluent Limits, 391-2000-003, 12/97.
☐	Implementation Guidance Design Conditions, 391-2000-006, 9/97.
☐	Technical Reference Guide (TRG) WQM 7.0 for Windows, Wasteload Allocation Program for Dissolved Oxygen and Ammonia Nitrogen, Version 1.0, 391-2000-007, 6/2004.
☐	Interim Method for the Sampling and Analysis of Osmotic Pressure on Streams, Brines, and Industrial Discharges, 391-2000-008, 10/1997.
☐	Implementation Guidance for Section 95.6 Management of Point Source Phosphorus Discharges to Lakes, Ponds, and Impoundments, 391-2000-010, 3/99.
☐	Technical Reference Guide (TRG) PENTOXSD for Windows, PA Single Discharge Wasteload Allocation Program for Toxics, Version 2.0, 391-2000-011, 5/2004.
☒	Implementation Guidance for Section 93.7 Ammonia Criteria, 391-2000-013, 11/97.
☐	Policy and Procedure for Evaluating Wastewater Discharges to Intermittent and Ephemeral Streams, Drainage Channels and Swales, and Storm Sewers, 391-2000-014, 4/2008.
☒	Implementation Guidance Total Residual Chlorine (TRC) Regulation, 391-2000-015, 11/1994.
☐	Implementation Guidance for Temperature Criteria, 391-2000-017, 4/09.
☐	Implementation Guidance for Section 95.9 Phosphorus Discharges to Free Flowing Streams, 391-2000-018, 10/97.
☐	Implementation Guidance for Application of Section 93.5(e) for Potable Water Supply Protection Total Dissolved Solids, Nitrite-Nitrate, Non-Priority Pollutant Phenolics and Fluorides, 391-2000-019, 10/97.
☐	Field Data Collection and Evaluation Protocol for Determining Stream and Point Source Discharge Design Hardness, 391-2000-021, 3/99.
☐	Implementation Guidance for the Determination and Use of Background/Ambient Water Quality in the Determination of Wasteload Allocations and NPDES Effluent Limitations for Toxic Substances, 391-2000-022, 3/1999.
☒	Design Stream Flows, 391-2000-023, 9/98.
☐	Field Data Collection and Evaluation Protocol for Deriving Daily and Hourly Discharge Coefficients of Variation (CV) and Other Discharge Characteristics, 391-2000-024, 10/98.
☐	Evaluations of Phosphorus Discharges to Lakes, Ponds and Impoundments, 391-3200-013, 6/97.
☐	Pennsylvania's Chesapeake Bay Tributary Strategy Implementation Plan for NPDES Permitting, 4/07.
☒	SOP: Establishing Effluent limitation for individual sewage permit
☐	Other: WIP 2 and supplement

8. Attachments

A. Topographical Map



B. WQM Model Results

WQM 7.0 Effluent Limits

SWP Basin	Stream Code	Stream Name
07G	7919	CHICKIES 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)
28.600	Gretna Springs	PA0081787	0.026	CBOD5	25		
				NH3-N	2.91	5.82	
				Dissolved Oxygen			5

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)
27.800	PA Dutch Countr	PA0081191	0.025	CBOD5	25		
				NH3-N	6.48	12.96	
				Dissolved Oxygen			5

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)
27.300	Pinch Pond	PA0086461	0.017	CBOD5	25		
				NH3-N	18.31	36.62	
				Dissolved Oxygen			5

Permit No. PA0081787

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
07G	7919	CHICKIES CREEK	**28.600**	625.00	0.40	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	0.160	0.00	0.00	0.000	0.000	0.0	0.00	0.00	20.00	7.85	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
Gretna Springs	PA0081787	0.0264	0.0264	0.0264	0.000	25.00	7.36

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

Permit No. PA0081787

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
07G	7919	CHICKIES CREEK	**27.800**	580.00	1.20	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	0.160	0.00	0.00	0.000	0.000	0.0	0.00	0.00	20.00	7.85	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
PA Dutch Countr	PA0081191	0.0250	0.0250	0.0250	0.000	25.00	7.40

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

Permit No. PA0081787

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
07G	7919	CHICKIES CREEK	**27.300**	540.00	2.35	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	0.160	0.00	0.00	0.000	0.000	0.0	0.00	0.00	20.00	7.85	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
Pinch Pond	PA0086461	0.0172	0.0172	0.0172	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

Permit No. PA0081787

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
07G	7919	CHICKIES CREEK	**26.300**	520.00	2.36	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	0.160	0.00	0.00	0.000	0.000	0.0	0.00	0.00	20.00	7.85	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	0.00	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

Permit No. PA0081787

WQM 7.0 Hydrodynamic Outputs

SWP Basin	Stream Code	Stream Name
07G	7919	CHICKIES 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												
28.600	0.06	0.00	0.06	.0408	0.01065	.359	3.78	10.53	0.08	0.632	21.95	7.59
27.800	0.19	0.00	0.19	.0795	0.01515	.41	6.21	15.14	0.11	0.287	21.46	7.65
27.300	0.38	0.00	0.38	.1061	0.00379	.453	9.41	20.77	0.11	0.540	21.10	7.63
Q1-10 Flow												
28.600	0.04	0.00	0.04	.0408	0.01065	NA	NA	NA	0.07	0.726	22.50	7.54
27.800	0.12	0.00	0.12	.0795	0.01515	NA	NA	NA	0.09	0.338	21.96	7.60
27.300	0.24	0.00	0.24	.1061	0.00379	NA	NA	NA	0.09	0.650	21.53	7.57
Q30-10 Flow												
28.600	0.09	0.00	0.09	.0408	0.01065	NA	NA	NA	0.09	0.565	21.60	7.63
27.800	0.26	0.00	0.26	.0795	0.01515	NA	NA	NA	0.12	0.252	21.17	7.69
27.300	0.51	0.00	0.51	.1061	0.00379	NA	NA	NA	0.13	0.471	20.86	7.67

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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		

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WQM 7.0 Wasteload Allocations

SWP Basin	Stream Code	Stream Name
07G	7919	CHICKIES 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
28.600	Gretna Springs	4.64	9.3	4.64	8.18	3	12
27.800	PA Dutch Countr	4.06	16.96	4.41	14.93	3	12
27.300	Pinch Pond	4.6	46.17	4.78	40.65	3	12

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
28.600	Gretna Springs	1.19	3.73	1.19	2.91	3	22
27.800	PA Dutch Countr	1.07	8.31	1.19	6.48	3	22
27.300	Pinch Pond	1.16	23.47	1.22	18.31	3	22

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)		
28.60	Gretna Springs	25	25	2.91	2.91	5	5	0	0
27.80	PA Dutch Countr	25	25	6.48	6.48	5	5	0	0
27.30	Pinch Pond	25	25	18.31	18.31	5	5	0	0

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WQM 7.0 D.O.Simulation

SWP Basin	Stream Code	Stream Name
07G	7919	CHICKIES CREEK

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
28.600	0.026	21.948	7.591
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
3.776	0.359	10.529	0.077
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
10.96	1.233	1.13	0.813
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
6.980	27.273	Owens	5
Reach Travel Time (days)			
0.632			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.063	10.06	1.08	7.75
0.126	9.24	1.02	7.95
0.189	8.49	0.97	7.95
0.253	7.80	0.92	7.95
0.316	7.16	0.88	7.95
0.379	6.57	0.83	7.95
0.442	6.04	0.79	7.95
0.505	5.54	0.75	7.95
0.568	5.09	0.71	7.95
0.632	4.68	0.68	7.95

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
27.800	0.051	21.464	7.653
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
6.209	0.410	15.141	0.107
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
6.31	1.099	1.19	0.784
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
7.669	26.086	Owens	5
Reach Travel Time (days)			
0.287			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.029	6.10	1.16	8.02
0.057	5.90	1.13	8.02
0.086	5.70	1.11	8.02
0.115	5.51	1.08	8.02
0.143	5.33	1.06	8.02
0.172	5.16	1.04	8.02
0.201	4.98	1.01	8.02
0.229	4.82	0.99	8.02
0.258	4.66	0.97	8.02
0.287	4.51	0.95	8.02

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WQM 7.0 D.O.Simulation

SWP Basin	Stream Code	Stream Name
07G	7919	CHICKIES CREEK

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
27.300	0.069	21.101	7.630
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
9.412	0.453	20.775	0.113
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
4.68	0.848	1.54	0.762
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
7.940	22.371	Owens	5
Reach Travel Time (days)			
0.540			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.054	4.46	1.48	8.08
0.108	4.25	1.42	8.08
0.162	4.05	1.36	8.08
0.216	3.86	1.31	8.08
0.270	3.68	1.26	8.08
0.324	3.50	1.21	8.08
0.378	3.34	1.16	8.08
0.432	3.18	1.11	8.08
0.486	3.03	1.07	8.08
0.540	2.89	1.02	8.08

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C. TRC Calculations

Copy of TRC_CALC1

TRC EVALUATION

Input appropriate values in A3:A9 and D3:D9

0.06	= Q stream (cfs)	0.5	= CV Daily
0.0264	= 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 =	0.488	1.3.2.iii	WLA cfc =	0.468
PENTOXSD TRG	5.1a	LTAMULT afc =	0.373	5.1c	LTAMULT cfc =	0.581
PENTOXSD TRG	5.1b	LTA_afc=	0.182	5.1d	LTA_cfc =	0.272

Source		Effluent Limit Calculations		
PENTOXSD TRG	5.1f	AML MULT =	1.231	
PENTOXSD TRG	5.1g	AVG MON LIMIT (mg/l) =	0.224	AFC
		INST MAX LIMIT (mg/l) =	0.731	

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)

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