pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Northwest Regional Office
CLEAN WATER PROGRAM

NPDES PERMIT FACT SHEET
INDIVIDUAL SEWAGE

Application Type	**Renewal**	Application No.	**PA0093149**
Facility Type	**Non-Municipal**	APS ID	**641171**
Major / Minor	**Minor**	Authorization ID	**1223832**

Applicant and Facility Information

Applicant Name	**Creekside Mushrooms, Ltd.**	Facility Name	**Creekside Mushrooms**
Applicant Address	1 Moonlight Drive	Facility Address	1 Moonlight Drive
	Worthington, PA 16262		Worthington, PA 16262
Applicant Contact	Randy Lasko, Plant Manager	Facility Contact	Randy Lasko, Plant Manager
Applicant Phone	(724) 297-5491, ext. 2	Facility Phone	(724) 297-5491, ext. 2
Client ID	65058	Site ID	237466
Ch 94 Load Status	Not Overloaded	Municipality	West Franklin Township
Connection Status	No Limitations	County	Armstrong County
Date Application Received	April 5, 2018	EPA Waived?	Yes
Date Application Accepted	April 11, 2018	If No, Reason	-
Purpose of Application	Renewal of an NPDES Permit for an existing discharge of treated sanitary wastewater. The previous industrial waste-related outfalls were removed from this renewal.		

Summary of Review

Act 14 - Proof of Notification was submitted and received.

A Part II Water Quality Management permit is not required at this time.

The applicant should be able to meet the limits of this permit, which will protect the uses of the receiving stream.

I. OTHER REQUIREMENTS:

A. Stormwater into sewers
B. Right of way
C. Solids handling
D. Public sewerage availability
E. Effluent Chlorine Optimization and Minimization

SPECIAL CONDITIONS:

II. Solids Management

There are no open violations in efacts associated with the subject Client ID (65058) as of 9/24/2021.

This facility is essentially closed, and the associated industrial operations ceased during the year 2009. All industrial material from the previous industrial activities has been removed as summarized in the Department's October 29, 2019 inspection report. Therefore, stormwater outfalls 002, 003, 004, 005, and 006 are proposed to be removed from this permit. A few employees remain at this facility for the purposes of general building and grounds maintenance. However, the sanitary sewage generated at this facility has been isolated and is now being collected in holding tanks for pumping and hauling to an offsite disposal facility. Outfall 001 is currently permitted for a combination of mushroom processing water, boiler blowdown, sanitary sewage, and stormwater runoff. Treatment for this outfall is permitted under WQM Permit No. 368S042 and includes a recycle pond that is pumped to an aerated primary pond, that then flows to a secondary pond via a gate, that then flows through a chlorine contact tank, dechlorination, and is then discharged to Outfall 001. The permittee has indicated that they plan to clean the lagoons, eliminate the treatment processes, convert the lagoons to stormwater ponds, and then terminate the facilities NPDES and WQM permits. The permittee is currently preparing a closure plan and request to terminate the permit. Until the closure is complete, the permit will be drafted and reissued for the outfall 001 discharge. This will also change the fee category from "Minor IW Facility without ELG" ($1,500 annual fee) to "Minor Sewage >= 0.05 MGD and < 1.0 MGD – Individual Permit" ($1,000 annual fee).

Approve	Deny	Signatures	Date
X		Stephen A. McCauley	1/21/2022
		Stephen A. McCauley, E.I.T. / Environmental Engineering Specialist	
X		Justin C. Dickey	1/21/2022
		Justin C. Dickey, P.E. / Environmental Engineer Manager	

Discharge, Receiving Waters and Water Supply Information

Outfall No.	001	Design Flow (MGD)	0.0915
Latitude	40º 49' 48.00"	Longitude	-79º 39' 17.00"
Quad Name	-	Quad Code	-
Wastewater Description:	Sewage Effluent		
Receiving Waters	Buffalo Creek (HQ-TSF)	Stream Code	42557
NHD Com ID	123973814	RMI	19.48
Drainage Area	81.2 mi^2	Yield (cfs/mi^2)	0.027
Q_{7-10} Flow (cfs)	2.25	Q_{7-10} Basis	calculated
Elevation (ft)	980	Slope (ft/ft)	0.002602
Watershed No.	18-F	Chapter 93 Class.	HQ-TSF*
Existing Use	-	Existing Use Qualifier	-
Exceptions to Use	-	Exceptions to Criteria	-
Assessment Status	Impaired**		
Cause(s) of Impairment	Algae, Siltation		
Source(s) of Impairment	Natural Sources, On-Site Treatment Systems (septic systems and similar decentralized systems)		
TMDL Status	Final, March 5, 2007	Name	UNT Buffalo Creek (AMD Metals)***

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

Nearest Downstream Public Water Supply Intake	Harrison Township Water Authority		
PWS Waters	Allegheny River	Flow at Intake (cfs)	2,250
PWS RMI	24.2	Distance from Outfall (mi)	24.5

* - Since this is neither a new, nor an expanding discharge to HQ/EV waters, there was no evaluation of anti-degradation requirements performed.

** - The receiving stream at the Outfall is impaired. The contribution of algae and siltation from a sewage plant of this nature is expected to be less than water quality criteria and therefore not contributing to the stream impairment. No new monitoring related to the stream impairment will be added with this renewal.

*** - There is a TMDL for AMD-related metals including Aluminum, Iron, and Manganese. Due to the TMDL, previous limits were set for Outfall 001 for those parameters. Since the limits are being attained and the TMDL is still in effect, the limits for Aluminum, Iron, and Manganese will be retained with this renewal.

Sludge use and disposal description and location(s): Sludge is not used, the final closure of the lagoons is anticipated to include land application as part of the closure plan.

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.

Narrative: This Fact Sheet details the determination of draft NPDES permit limits for an existing discharge of 0.0915 MGD of treated sewage and uncontaminated stormwater from an STP in West Franklin Township, Armstrong County.

The previous wastestreams at this facility included mushroom processing wastewaters, boiler blowdown, sewage treatment, and stormwater runoff. Since this facility is no longer processing mushrooms, and is therefore no longer classified as an industrial facility, the sewage treatment with uncontaminated stormwater was the only wastestream that was discharged until 2021. At that time, the sewage generated at this facility was isolated. Therefore, the current discharge is generally comprised of stormwater. Until the lagoons are cleaned out, the uncontaminated stormwater discharging to the treatment lagoons does come into contact with sewage sludge prior to being discharged. Therefore, there is the potential for the discharge of pollutants associated with a sewage discharge. The permittee is currently preparing a closure plan for the facility lagoons. In consideration of this, the Department is proposing the continued monitoring for sewage related parameters and TMDL related parameters. The lagoon closure is expected to occur in the beginning of the upcoming permit term and the NPDES permit will then be terminated.

Treatment permitted under Sewerage Permit No. 368S042-A2 consists of the following: An aeration tank, liquid sodium hypochlorite disinfection with a contact tank, sodium thiosulfate dechlorination tablets, and three settling ponds in series. Sludge removal from the ponds is performed via vacuum truck.

1. Streamflow:

Buffalo Creek near Freeport, PA - USGS Gage 03049000 (1942-2008):

$Q_{7\text{-}10}$:	3.8	cfs	(USGS StreamStats)
Drainage Area:	137	sq. mi.	(USGS StreamStats)
Yieldrate:	0.027	cfsm	calculated

Buffalo Creek at Outfall 001:

Yieldrate:	0.027	cfsm	calculated above
Drainage Area:	81.2	sq. mi.	(USGS StreamStats)
$Q_{7\text{-}10}$:	2.25	cfs	calculated

% of stream allocated: 100% Basis: No nearby discharges

2. Wasteflow:

Maximum discharge: 0.0915 MGD = 0.14 cfs

Runoff flow period: 24 hours Basis: Runoff flow for lagoon treatment

There is greater than 3 parts stream flow (Q7-10) to 1 part effluent (design flow). In accordance with the SOP, the treatment requirements in document number 391-2000-014, titled, "Policy and Procedure for Evaluating Wastewater Discharges to Intermittent and Ephemeral Streams, Drainage Channels and Swales, and Storm Sewers", dated April 12, 2008, are not required to be evaluated for this facility.

Flow will be required to be monitored as authorized under Chapter 92a.61, and as recommended in the SOP.

3. Parameters:

The following parameters were evaluated: pH, Total Suspended Solids, Fecal Coliform, E. Coli, Total Phosphorus, Total Nitrogen, NH_3-N, $CBOD_5$, Dissolved Oxygen, Total Residual Chlorine, influent Total Suspended Solids, and influent BOD5. NH_3-N, $CBOD_5$, and Dissolved Oxygen were evaluated using WQM 7.0 at the discharge point.

a. pH

Between 6.0 and 9.0 at all times

Basis: Application of Chapter 93.7 technology-based limits. The measurement frequency was previously set to 2/month. Table 6-3 in the "Technical Guidance for the Development and Specification of Effluent Limitations" (362-0400-001) recommends that the monitoring frequency be established at 1/day. However, the 2/month monitoring frequency will be retained considering that no active sewage discharge is occurring, and the discharge will be eliminated in the upcoming permit cycle.

b. Total Suspended Solids

Limits are 30 mg/l as a monthly average and 60 as an instantaneous maximum.

Basis: Application of Chapter 92a47 technology-based limits.

c. Fecal Coliform

05/01 - 09/30:	200/100ml	(monthly average geometric mean)
	1,000/100ml	(instantaneous maximum)
10/01 - 04/30:	2,000/100ml	(monthly average geometric mean)
	10,000/100ml	(instantaneous maximum)

Basis: Application of Chapter 92a47 technology-based limits

d. E. Coli

Monitoring for E. Coli will not be added since this discharge will be eliminated in the upcoming permit cycle.

e. Phosphorus

☐ Limit necessary due to:

☐ Discharge to lake, pond, or impoundment
☐ Discharge to stream

Basis: Chapter 96.5 does not apply.

☒ Limit not necessary

Basis: Total Phosphorus monitoring will not be established since the discharge will be eliminated in the upcoming permit cycle.

f. Total Nitrogen

Total Nitrogen monitoring will not be established since the discharge will be eliminated in the upcoming permit cycle.

g. Ammonia-Nitrogen (NH_3-N)

Median discharge pH to be used:	7.8	Standard Units (S.U.)
		Basis: eDMR data
Discharge temperature:	25°C	(default value used in the absence of data)
Median stream pH to be used:	7.0	Standard Units (S.U.)
		Basis: default value used in the absence of data
Stream Temperature:	25˚C	(default value used for TSF modeling)
Background NH_3-N concentration:	0.1	mg/l
		Basis: Default value
Calculated NH_3-N Summer limits:	21.7	mg/l (monthly average)
	43.4	mg/l (instantaneous maximum)
Calculated NH_3-N Winter limits:	25.0	mg/l (monthly average)
	50.0	mg/l (instantaneous maximum)

Result: WQ modeling resulted in the summer limits above (see Attachment 1). The winter limits are calculated as three times the summer limits, but since the technology-based limits would govern, they will be used. Since the previous NH3-N limits are more restrictive, and are attainable, they will be retained.

h. $CBOD_5$

Median discharge pH to be used:	7.8	Standard Units (S.U.)
		Basis: eDMR data
Discharge temperature:	25°C	(default value used in the absence of data)
Median stream pH to be used:	7.0	Standard Units (S.U.)
		Basis: default value used in the absence of data
Stream Temperature:	25˚C	(default value used for TSF modeling)
Background $CBOD_5$ concentration:	2.0	mg/l
		Basis: Default value
$CBOD_5$ Summer limits:	25.0	mg/l (monthly average)
	50.0	mg/l (instantaneous maximum)
$CBOD_5$ Winter limits:	25.0	mg/l (monthly average)
	50.0	mg/l (instantaneous maximum)

Result: WQ modeling resulted in the summer limits above (see Attachment 1), which are the same as in the previous permit. The winter limits are calculated as three times the summer limits, but since the

technology-based limits would govern, they will be used. Since the summer and winter limits are technology-based, per the SOP, the year-round limit of 25.0 mg/l monthly average and 50.0 mg/l instantaneous maximum will be retained with this renewal.

i. Dissolved Oxygen (DO)

☐ 4.0 mg/l - minimum desired in effluent to protect all aquatic life
☐ 5.0 mg/l - desired in effluent for CWF, WWF, or TSF
☐ 6.0 mg/l - minimum required due to discharge falling under guidance document 391-2000-014
☐ 8.0 mg/l - required due to discharge going to a naturally reproducing salmonid stream

Discussion: The previous permit renewal did not include Dissolved Oxygen limits or monitoring. The technology-based minimum of 4.0 mg/l is recommended by the WQ Model (see Attachment 1) and the SOP based on Chapter 93.7, under the authority of Chapter 92a.61. Dissolved Oxygen sampling was not required as part of the renewal application at the time of submittal. Therefore, the Department lacks Dissolved Oxygen data for this facility, and it is unknown if this facility can meet a 4.0 mg/l effluent limitation. Table 6-3 in the "Technical Guidance for the Development and Specification of Effluent Limitations" (362-0400-001) recommends that the monitoring frequency be established at 1/day. In this particular case, the Department will only establish Dissolved Oxygen monitoring in the permit. Similar to other parameters, a 2/month monitoring frequency will be established considering that no active sewage discharge is occurring, and the discharge will be eliminated in the upcoming permit cycle.

j. Total Residual Chlorine (TRC)

☐ No limit necessary

Basis: N/A

☒ TRC limits: 0.5 mg/l (monthly average)
1.6 mg/l (instantaneous maximum)

Basis: The TRC limits above are technology-based using the TRC_Calc Spreadsheet (see Attachment 2) which are the same as in the previous permit. The measurement frequency was previously set to 2/month. Table 6-3 in the "Technical Guidance for the Development and Specification of Effluent Limitations" (362-0400-001) recommends that the monitoring frequency be established at 1/day. However, the 2/month monitoring frequency will be retained considering that no active sewage discharge is occurring, and the discharge will be eliminated in the upcoming permit cycle.

k. Anti-Backsliding

Based on 40 CFR §122.44(l)(i)(A) and 40 CFR §122.44(l)(i)(B)(2), this permit can be renewed with modifications to contain less stringent effluent limitations.

The TRC calculation spreadsheet inputs for the number of samples was changed from 4 to 30 as the frequency in this renewal will be increased from 2/month to daily. Due to the change, the technology-based instantaneous maximum limit changed from 1.2 mg/l to 1.6 mg/l.

The previous permit required mass loading limitations, but since they are not required per the SOP based on the permitted flow, the mass loading limits were removed with this renewal. The instantaneous maximum limits for many of the parameters were incorrectly set as 2.5 times the monthly average. Those limits were reduced to the correct 2.0 times the monthly average.

4. Reasonable Potential Analysis for Receiving Stream:

A Reasonable Potential Analysis was not performed in accordance with State practices for Outfall 001 since no sampling other than sewage-related parameters was performed for this facility with the renewal application.

5. Reasonable Potential for Downstream Public Water Supply (PWS):

A Reasonable Potential Analysis, if performed, does not calculate limits for parameters that are based on PWS criteria (TDS, Chloride, Bromide, and Sulfate). However, since no data was provided, mass-balance calculations were not able to be performed.

Nearest Downstream potable water supply (PWS): Harrison Township Water Authority
Distance downstream from the point of discharge: 24.5 miles (approximate)

☒ No limits necessary
☐ Limits needed

Basis: Significant dilution available.

6. Attachment List:

Attachment 1 - WQ Modeling Printouts

Attachment 2 - TRC_Calc Spreadsheet

(The Attachments above can be found at the end of this document)

Compliance History

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

Parameter	JUL-21	JUN-21	MAY-21	APR-21	MAR-21	FEB-21	JAN-21	DEC-20	NOV-20	OCT-20	SEP-20	AUG-20
Flow (MGD) Average Monthly	0.054	0.025	0.025	0.022	0.043		0.043	0.032	0.013		0.20	
Flow (MGD) Daily Maximum	0.065	0.036	0.036	0.022	0.050		0.043	0.032	0.013		0.046	
pH (S.U.) Minimum	7.50	7.42	7.55	6.78	8.41		7.76	7.70	7.73		7.52	
pH (S.U.) Maximum	7.50	7.65	7.75	6.80	8.45		7.89	7.85	7.73		7.52	
TRC (mg/L) Average Monthly	0.05	0.24	0.12	0.08	0.12		0.04	0.35	0.05		0.06	
TRC (mg/L) Instantaneous Maximum	0.10	0.28	0.14	0.10	0.14		0.04	0.60	0.10		0.12	
CBOD5 (lbs/day) Average Monthly	1.37	0.90	0.63	0.54	1.08		2.07	0.33	0.33		0.63	
CBOD5 (lbs/day) Daily Maximum	1.62	1.08	0.90	0.54	1.26		3.06	0.33	0.33		1.27	
CBOD5 (mg/L) Average Monthly	3.1	3.0	3.0	3.0	3		5.8	5.5	1.5		1.7	
CBOD5 (mg/L) Daily Maximum	3.1	3.0	3.0	3.0	3		8.5	7.9	3.0		3.3	
TSS (lbs/day) Average Monthly	2.25	2.52	0.63	0.72	3.48		1.26	0.90	0.76		0.58	
TSS (lbs/day) Daily Maximum	2.88	4.32	0.90	0.90	5.46		1.44	1.08	0.76		1.15	
TSS (mg/L) Average Monthly	5.5	7.5	3.0	4.0	9.0		3.5	3.0	3.5		1.5	
TSS (mg/L) Daily Maximum	8.0	12.0	3.0	5.0	13.0		4.0	3.0	7.0		3.0	
Fecal Coliform (CFU/100 ml) Geometric Mean	4	1.0	1	1.0	1		1	1	2		1	
Fecal Coliform (CFU/100 ml) Instantaneous Maximum	15	1.0	1								1	
Ammonia (lbs/day) Average Monthly	0.11	0.08	0.03	0.04	0.05		0.06	0.14	0.02		0.02	
Ammonia (lbs/day) Daily Maximum	0.14	0.12	0.05	0.05	0.06		0.08	0.18	0.02		0.04	
Ammonia (mg/L) Average Monthly	0.24	0.25	0.15	0.24	0.15		0.18	0.46	0.10		0.06	

Ammonia (mg/L) Daily Maximum	0.26	0.33	0.16	0.27	0.19		0.21	0.51	0.19		0.11	
Total Aluminum (lbs/day) Average Monthly	0.05	0.03	0.03	0.02	0.04		0.04	0.03	0.01		0.02	
Total Aluminum (lbs/day) Daily Maximum	0.05	0.04	0.05	0.02	0.04		0.04	0.04	0.01		0.04	
Total Aluminum (mg/L) Average Monthly	0.10	0.10	0.15	0.10	0.10		0.10	0.10	0.05		0.05	
Total Aluminum (mg/L) Daily Maximum	0.10	0.10	0.16	0.10	0.10		0.10	0.10	0.10		0.10	
Total Iron (lbs/day) Average Monthly	0.04	0.03	0.06	0.05	0.04		0.02	0.05	0.02		0.02	
Total Iron (lbs/day) Daily Maximum	0.05	0.04	0.08	0.07	0.04		0.03	0.06	0.02		0.04	
Total Iron (mg/L) Average Monthly	0.09	0.09	0.27	0.31	0.12		0.07	0.15	0.11		0.05	
Total Iron (mg/L) Daily Maximum	0.09	0.10	0.28	0.37	0.13		0.08	0.17	0.22		0.10	
Total Manganese (lbs/day) Average Monthly	0.14	0.07	0.002	0.02	0.03		0.02	0.03	0.01		0.05	
Total Manganese (lbs/day) Daily Maximum	0.18	0.08	0.03	0.03	0.03		0.02	0.04	0.01		0.09	
Total Manganese (mg/L) Average Monthly	0.30	0.22	0.11	0.13	0.09		0.05	0.08	0.03		0.12	
Total Manganese (mg/L) Daily Maximum	0.33	0.22	0.13	0.14	0.10		0.06	0.10	0.06		0.24	

Proposed Effluent Limitations and Monitoring Requirements

The limitations and monitoring requirements specified below are proposed for the draft permit, and reflect the most stringent limitations amongst technology, water quality and BPJ. Instantaneous Maximum (IMAX) limits are determined using multipliers of 2 (conventional pollutants) or 2.5 (toxic pollutants). Sample frequencies and types are derived from the "NPDES Permit Writer's Manual" (362-0400-001), SOPs and/or BPJ.

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

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly	Average Weekly	Minimum	Average Monthly	Maximum	Instant. Maximum		
Flow (MGD)	Report	Report Daily Max	XXX	XXX	XXX	XXX	1/day	Recorded
pH (S.U.)	XXX	XXX	6.0 Inst Min	XXX	XXX	9.0	2/month	Grab
DO	XXX	XXX	Report Inst Min	XXX	XXX	XXX	2/month	Grab
TRC	XXX	XXX	XXX	0.5	XXX	1.6	2/month	Grab
CBOD5	XXX	XXX	XXX	25.0	XXX	50	2/month	8-Hr Composite
TSS	XXX	XXX	XXX	30.0	XXX	60	2/month	8-Hr Composite
Fecal Coliform (No./100 ml) Oct 1 - Apr 30	XXX	XXX	XXX	2000 Geo Mean	XXX	10000	2/month	Grab
Fecal Coliform (No./100 ml) May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	XXX	1000	2/month	Grab
Ammonia-Nitrogen Nov 1 - Apr 30	XXX	XXX	XXX	15.0	XXX	30	2/month	8-Hr Composite
Ammonia-Nitrogen May 1 - Oct 31	XXX	XXX	XXX	5.0	XXX	10	2/month	8-Hr Composite
Total Aluminum	XXX	XXX	XXX	4.0	XXX	8	2/month	8-Hr Composite
Total Iron	XXX	XXX	XXX	2.0	XXX	4	2/month	8-Hr Composite
Total Manganese	XXX	XXX	XXX	1.0	XXX	2	2/month	8-Hr Composite

Compliance Sampling Location: at Outfall 001, after disinfection.

Flow and Dissolved Oxygen are monitor only based on Chapter 92a.61. The limits for pH are technology-based on Chapter 93.7. The Total Residual Chlorine (TRC) limits are technology-based on Chapter 93.7. The limits for $CBOD_5$, Total Suspended Solids, and Fecal Coliforms are technology-based on Chapter 92a.47. The limits for Ammonia-Nitrogen are water quality-based on Chapter 93.7. The limits for Total Aluminum, Total Iron, and Total Manganese are technology-based on Chapter 93.7.

Attachment 1

WQM 7.0 Effluent Limits

SWP Basin	Stream Code	Stream Name
18F	42557	BUFFALO 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)
19.480	Creekside	PA0093149	0.091	CBOD5	25		
				NH3-N	21.76	43.52	
				Dissolved Oxygen			4

WQM 7.0 D.O.Simulation

SWP Basin	Stream Code	Stream Name
18F	42557	BUFFALO CREEK

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
19.480	0.091	25.000	7.023
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
29.521	0.650	45.403	0.122
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
3.39	0.110	1.32	1.029
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
7.986	3.386	Tsivoglou	7
Reach Travel Time (days)			
3.840			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.384	3.22	0.89	7.07
0.768	3.05	0.60	7.17
1.152	2.90	0.40	7.44
1.536	2.75	0.27	7.54
1.920	2.61	0.18	7.54
2.304	2.47	0.12	7.54
2.688	2.34	0.08	7.54
3.072	2.22	0.06	7.54
3.456	2.11	0.04	7.54
3.840	2.00	0.03	7.54

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	7		

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
18F	42557	BUFFALO CREEK	**19.480**	980.00	81.20	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	0.027	0.00	0.00	0.000	0.000	0.0	0.00	0.00	25.00	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
Creekside	PA0093149	0.0915	0.0000	0.0000	0.000	25.00	7.80

Parameter Data

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

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
18F	42557	BUFFALO CREEK	**11.840**	875.00	98.00	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	0.027	0.00	0.00	0.000	0.000	0.0	0.00	0.00	25.00	7.00	0.00	0.00
Q1-10		0.00	0.00	0.000	0.000							
Q30-10		0.00	0.00	0.000	0.000							

Discharge Data

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

Parameter Data

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

WQM 7.0 Wasteload Allocations

SWP Basin	Stream Code	Stream Name
18F	42557	BUFFALO 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
19.480	Creekside	10.73	50	10.73	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
19.480	Creekside	1.36	25	1.36	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)		
19.48	Creekside	25	25	21.76	21.76	4	4	0	0

WQM 7.0 Hydrodynamic Outputs

SWP Basin	Stream Code	Stream Name
18F	42557	BUFFALO 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												
19.480	2.19	0.00	2.19	.1416	0.00260	.65	29.52	45.4	0.12	3.840	25.00	7.02
Q1-10 Flow												
19.480	1.40	0.00	1.40	.1416	0.00260	NA	NA	NA	0.10	4.838	25.00	7.03
Q30-10 Flow												
19.480	2.98	0.00	2.98	.1416	0.00260	NA	NA	NA	0.14	3.262	25.00	7.02

Attachment 2

TRC EVALUATION

Input appropriate values in A3:A9 and D3:D9

2.25	= Q stream (cfs)	0.5	= CV Daily
0.0915	= 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 = 5.090	1.3.2.iii	WLA cfc = 4.954
PENTOXSD TRG	5.1a	LTAMULT afc = 0.373	5.1c	LTAMULT cfc = 0.581
PENTOXSD TRG	5.1b	LTA_afc= 1.897	5.1d	LTA_cfc = 2.880

Source		Effluent Limit Calculations	
PENTOXSD TRG	5.1f	AML MULT = 1.231	
PENTOXSD TRG	5.1g	AVG MON LIMIT (mg/l) = 0.500	BAT/BPJ
		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)**