Pennsylvania Department of Environmental Protection

Northwest Regional Office
CLEAN WATER PROGRAM

NPDES PERMIT FACT SHEET INDIVIDUAL SEWAGE

Application Type	**Renewal**	Application No.	**PA0090514**
Facility Type	**Non-Municipal**	APS ID	**1122363**
Major / Minor	**Minor**	Authorization ID	**1500739**

Applicant and Facility Information

Applicant Name	**Lks Enterprises LLC**	Facility Name	**Gulick MHP**
Applicant Address	400 Frost Hollow Road	Facility Address	457 Kepple Road
	Easton, PA 18040-1209		Sarver, PA 16055-8613
Applicant Contact	John King	Facility Contact	
Applicant Phone		Facility Phone	
Client ID	312904	Site ID	464565
Ch 94 Load Status	Not Overloaded	Municipality	Winfield Township
Connection Status	No Limitations	County	Butler
Date Application Received	September 25, 2024	EPA Waived?	Yes
Date Application Accepted		If No, Reason	

Purpose of Application: This is an application to renew an NPDES Permit which serves a Mobile Home Park in Butler County and serves an estimated 78 residents.

Summary of Review

An amendment was issued during the last permit term that removed a proposed additional 1,000-gallon aerated sludge holding tank and 144 sq. ft. sand sludge dewatering bed. These facilities were never constructed and were determined to not be crucial to the treatment of the sewage entering the system.

Act 14 – Notifications were submitted and received.

There are no open violations in WMS for the subject Client ID (312904) as of 5/19/25.

Sludge use and disposal description and location(s): During the 2023 inspection report it was noted that sludge is hauled to the Punxatawney STP for treatment. It was reported on the application that 0 dry tons of sewage/sludge were produced or received in the last year.

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		Dustin Hargenrater Dustin Hargenrater / Project Manager	May 19, 2025
X		Adam Olesnanik Adam Olesnanik, P.E. / Environmental Engineer Manager	June 4, 2025

Discharge, Receiving Waters and Water Supply Information

Outfall No.	001	Design Flow (MGD)	.00525
Latitude	40º 44' 33.24"	Longitude	-79º 42' 13.11"
Quad Name	Freeport	Quad Code	40079F6
Wastewater Description:	Sewage Effluent		
Receiving Waters	Unnamed Tributary of Buffalo Creek (HQ-TSF)	Stream Code	42599
NHD Com ID	123971765	RMI	1.70
Drainage Area	0.91	Yield (cfs/mi^2)	0.008
Q_{7-10} Flow (cfs)	0.0073	Q_{7-10} Basis	USGS - StreamStats
Elevation (ft)	1074	Slope (ft/ft)	---
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	HABITAT ALTERATIONS, NUTRIENTS, SILTATION		
Source(s) of Impairment	AGRICULTURE, AGRICULTURE, HABITAT MODIFICATION - OTHER THAN HYDROMODIFICATION		
TMDL Status		Name	

Background/Ambient Data		Data Source
pH (SU)	7.0	Default
Temperature (°F)	20	Default - TSF
Hardness (mg/L)	100	Default
Other:		

Nearest Downstream Public Water Supply Intake		Harrison Township Water Authority	
PWS Waters	Allegheny River	Flow at Intake (cfs)	
PWS RMI	22.3	Distance from Outfall (mi)	9

Changes Since Last Permit Issuance: No changes to the receiving stream or discharge rate. Some modifications were made to the WQM permit to reflect proposed facilities that never got built.

Other Comments: Default values were used in the modeling as there was not any in-stream sample data to go off of.

Treatment Facility Summary

Treatment Facility Name: Gulick MHP

WQM Permit No.	Issuance Date
1079405 A-1	12/15/2016
1079405 A-1 T-1	7/26/2019
1079405 A-2 T-1	5/4/2021

Waste Type	Degree of Treatment	Process Type	Disinfection	Avg Annual Flow (MGD)
Sewage	Secondary With Ammonia Reduction	Activated Sludge	Hypochlorite	0.00525

Hydraulic Capacity (MGD)	Organic Capacity (lbs/day)	Load Status	Biosolids Treatment	Biosolids Use/Disposal
0.00525	11.42	Not Overloaded	Aerated Sludge Holding Tank	Landfill

Changes Since Last Permit Issuance: Removal of the additional 1,000-gallon aerated sludge holding tank and additional 144 sq. ft. of sand filter as it was never constructed.

Other Comments:

Compliance History

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

Parameter	Date	SBC	DMR Value	Units	Limit Value	Units
Fecal Coliform	05/31/24	IMAX	2419.6	No./100 ml	1000	No./100 ml

Summary of Inspections: There have been 2 inspections in the last two years. One inspection noted violations for failure to submit a permit renewal application prior to 180 days of expiration. With the submission of this application the violation was resolved.

Other Comments: There were no comments inputted into the non-compliance reporting form for this violation. Although this value exceeds the limit it is not a consistent violation and therefore no further action should be taken by the Department.

Development of Effluent Limitations

Outfall No. 001 **Design Flow (MGD)** .00525
Latitude 40º 44' 33.60" **Longitude** -79º 42' 12.90"
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)

Comments: CBOD5 limits will remain at 20 mg/l average monthly and 40 mg/l instantaneous maximum due to the facility meeting this limit consistently and no reason to backslide to 25/50 TBELs. The reasoning for implementing the 20/40 limits goes back to 2015 when the Department did away with seasonal variations for CBOD5/BOD5 limits. At the time, the 20/40 limits were imposed as the summertime limit and were more stringent than the TBEL 25/50 limits imposed for the winter so therefore they were carried over per the SOP.

Water Quality-Based Limitations

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

Parameter	Limit (mg/l)	SBC	Model
Ammonia Nitrogen	3.5	Average Monthly	3.61 mg/l – WQM 7.0 v 1.1
Ammonia Nitrogen	7.0	Instantaneous Maximum	7.24 mg/l – WQM 7.0 v 1.1
Dissolved Oxygen	6.0	Instantaneous Minimum	6 mg/l – WQM 7.0 v 1.1
TRC	0.2	Average Monthly	0.203 mg/l – TRC Calc
TRC	0.6	Instantaneous Maximum	0.618 mg/l – TRC Calc

Modeling using WQM 7.0 v 1.1 was completed for Ammonia-Nitrogen, Dissolved Oxygen, and CBOD5. The WQM 7.0 model uses a mass balance equation using in-stream data for $Q_{7\text{-}10}$, Yield, Drainage Area and average concentration data for pH using an interpolated average for the warm months. With this data it is able to calculate WQBELs for these parameters.

There was no in-stream data point available to gather enough information to reasonably assume the concentration of pH in the stream, so default values were used. The temperatures used for the model were also based on default values for TSF waters due to lack of in-stream sampling data. Hardness is not taken into consideration for the WQM 7.0 model and since the toxics management spreadsheet was not used for a reasonable potential analysis due to the assumption that toxic pollutants should not be introduced into the effluent for a Mobile Home Park, hardness values are considered to be default even though it is not used in the models.

When modeling the effluent, WQM 7.0 v 1.1 calculated limits of 3.61 mg/l Average Monthly and 7.24 mg/l Instantaneous Maximum for Ammonia Nitrogen. These values were rounded accordingly to the Round-off Guidelines found in the Permit Writers' Manual which translated to 3.5 mg/l Average Monthly and 7.0 mg/l Instantaneous Maximum limits. The permittee is able to meet this limit at least 75% of the time so a compliance schedule will not be introduced for Ammonia-Nitrogen for this renewal. Ammonia-Nitrogen is subject to winter-time limits of 3 times the summer limit so winter-time limits for Ammonia-Nitrogen will be 10.5 mg/l Average Monthly and 21.0 mg/l Instantaneous Maximum for the months of November through April.

The limitations for Dissolved Oxygen are being carried over from the last renewal as WQM 7.0 recommended the 6.0 mg/l stay the same. The dissolved oxygen limitation is based on a D.O. Goal of 6.0 for TSF waters which can be found in 25 PA Code Chapter 93.7 Water Quality Standards.

The TRC_Calc model was used to calculate Water Quality Based Effluent Limitations for TRC. The TRC Calc model takes into consideration receiving water flow, design flow of the facility, and the number of samples expected to be taken per month to create a mass-balance equation and produce Average Monthly and Instantaneous Maximum limits for TRC. The model produced limits of 0.203 mg/l Average Monthly and 0.618 mg/l Instantaneous Maximum. These were rounded down in accordance with the Round-off Guidelines in the Permit Writers' Manual which translates to 0.2 mg/l Average Monthly and 0.6 Instantaneous Maximum limits. The facility is not already meeting this limit at least 75% of the time so a 3-year compliance schedule will be introduced in the permit. The 3-year compliance schedule will consist of Submitting a TRC minimization plan within 1 year of the Permit Effective Date, Beginning Implementation of this minimization plan within 1 year of the Permit Effective Date, Submission of a progress report 2 years after the Permit Effective Date, and Final implementation of the new proposed limitations 3 years after the Permit Effective Date.

In general, sewage discharges with design flows > 2,000 GPD will include monitoring, at a minimum, for Total Phosphorous and Total Nitrogen in new and reissued permits, with a monitoring frequency equivalent to conventional pollutants in Table 6-3 of the Permit Writer's Manual where the facility discharges to nutrient-impaired waters. The receiving stream is impaired for nutrients just above the discharge so Total Nitrogen and Total Phosphorous monitoring frequency should match those of conventional pollutants in Table 6-3 of the Permit Writer's Manual per the SOP for Establishing Effluent Limitations for Individual Sewage Permits to ensure the facility is not causing or contributing to this impairment.

Sewage discharges will include monitoring, at a minimum, for E. Coli, in new and reissued permits, with a monitoring frequency of 1/year for design flows of 0.002 – 0.05 MGD per the SOP for Establishing Effluent Limitations for Individual Sewage Permits.

Best Professional Judgment (BPJ) Limitations

Comments: No BPJ Limits are being considered for this renewal.

Anti-Backsliding

N/A

Proposed Effluent Limitations and Monitoring Requirements

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

Outfall 001, Effective Period: Permit Effective Date through End of Interim Period 1.

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 Daily Min	XXX	9.0 Daily Max	XXX	1/day	Grab
DO	XXX	XXX	6.0 Daily Min	XXX	XXX	XXX	1/day	Grab
TRC	XXX	XXX	XXX	0.4	XXX	0.9	1/day	Grab
CBOD5	XXX	XXX	XXX	20.0	XXX	40.0	2/month	Grab
TSS	XXX	XXX	XXX	30.0	XXX	60.0	2/month	Grab
Fecal Coliform (No./100 ml) Oct 1 - Apr 30	XXX	XXX	XXX	2000 Geo Mean	XXX	10000	2/month	Grab
Fecal Coliform (No./100 ml) May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	XXX	1000	2/month	Grab
Total Nitrogen	XXX	XXX	XXX	Report	XXX	XXX	2/month	Grab
Ammonia Nov 1 - Apr 30	XXX	XXX	XXX	10.5	XXX	21.0	2/month	Grab
Ammonia May 1 - Oct 31	XXX	XXX	XXX	3.5	XXX	7.0	2/month	Grab
Total Phosphorus	XXX	XXX	XXX	Report	XXX	XXX	2/month	Grab
E. Coli (No./100 ml)	XXX	XXX	XXX	XXX	XXX	Report	1/year	Grab

Compliance Sampling Location: Outfall 001, after disinfection.

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: End of Interim Period 1 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 Daily Min	XXX	9.0 Daily Max	XXX	1/day	Grab
DO	XXX	XXX	6.0 Daily Min	XXX	XXX	XXX	1/day	Grab
TRC	XXX	XXX	XXX	0.2	XXX	0.6	1/day	Grab
CBOD5	XXX	XXX	XXX	20.0	XXX	40.0	2/month	Grab
TSS	XXX	XXX	XXX	30.0	XXX	60.0	2/month	Grab
Fecal Coliform (No./100 ml) Oct 1 - Apr 30	XXX	XXX	XXX	2000 Geo Mean	XXX	10000	2/month	Grab
Fecal Coliform (No./100 ml) May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	XXX	1000	2/month	Grab
Total Nitrogen	XXX	XXX	XXX	Report	XXX	XXX	2/month	Grab
Ammonia Nov 1 - Apr 30	XXX	XXX	XXX	10.5	XXX	21.0	2/month	Grab
Ammonia May 1 - Oct 31	XXX	XXX	XXX	3.5	XXX	7.0	2/month	Grab
Total Phosphorus	XXX	XXX	XXX	Report	XXX	XXX	2/month	Grab
E. Coli (No./100 ml)	XXX	XXX	XXX	XXX	XXX	Report	1/year	Grab

Compliance Sampling Location: Outfall 001, after disinfection.

Attachment 1
TRC_CALC Modeling Output Files

TRC_CALC

TRC EVALUATION

Input appropriate values in A3:A9 and D3:D9

0.01	= Q stream (cfs)	0.5	= CV Daily
0.00525	= Q discharge (MGD)	0.5	= CV Hourly
16	= 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 = 0.412	1.3.2.iii	WLA cfc = 0.394
PENTOXSD TRG	5.1a	LTAMULT afc = 0.373	5.1c	LTAMULT cfc = 0.581
PENTOXSD TRG	5.1b	LTA_afc= 0.153	5.1d	LTA_cfc = 0.229

Source		Effluent Limit Calculations	
PENTOXSD TRG	5.1f	AML MULT = 1.326	
PENTOXSD TRG	5.1g	AVG MON LIMIT (mg/l) = 0.203	AFC
		INST MAX LIMIT (mg/l) = 0.618	

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)**

Attachment 2
WQM 7.0 v 1.1 Modeling Output Files

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	42599	Trib 42599 to Buffalo Creek	**1.700**	1074.00	0.91	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	0.008	0.00	0.01	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
Gulick MHP	PA0090514	0.0052	0.0052	0.0052	0.000	25.00	7.01

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	6.00	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	42599	Trib 42599 to Buffalo Creek	**1.030**	916.00	1.87	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	0.009	0.00	0.02	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	20.00	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
18F	42599	Trib 42599 to 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												
1.700	0.01	0.00	0.01	.0081	0.04466	.266	2.33	8.73	0.02	1.646	22.63	7.01
Q1-10 Flow												
1.700	0.00	0.00	0.00	.0081	0.04466	NA	NA	NA	0.02	1.828	23.17	7.01
Q30-10 Flow												
1.700	0.01	0.00	0.01	.0081	0.04466	NA	NA	NA	0.03	1.507	22.25	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	6		

WQM 7.0 Wasteload Allocations

SWP Basin	Stream Code	Stream Name
18F	42599	Trib 42599 to 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
1.700	Gulick MHP	12.81	20.18	12.81	20.18	0	0

NH3-N Chronic Allocations

RMI	Discharge Name	Baseline Criterion (mg/L)	Baseline WLA (mg/L)	Multiple Criterion (mg/L)	Multiple WLA (mg/L)	Critical Reach	Percent Reduction
1.700	Gulick MHP	1.63	3.62	1.63	3.62	0	0

Dissolved Oxygen Allocations

RMI	Discharge Name	CBOD5		NH3-N		Dissolved Oxygen		Critical Reach	Percent Reduction
		Baseline (mg/L)	Multiple (mg/L)	Baseline (mg/L)	Multiple (mg/L)	Baseline (mg/L)	Multiple (mg/L)		
1.70	Gulick MHP	25	25	3.62	3.62	6	6	0	0

WQM 7.0 D.O.Simulation

SWP Basin	Stream Code	Stream Name
18F	42599	Trib 42599 to Buffalo Creek

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
1.700	0.005	22.633	7.005
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
2.327	0.266	8.731	0.025
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
14.11	1.052	1.91	0.857
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
7.062	22.449	Owens	6
Reach Travel Time (days)			
1.646			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.165	11.61	1.66	7.45
0.329	9.55	1.44	7.67
0.494	7.85	1.25	7.85
0.658	6.46	1.08	7.86
0.823	5.31	0.94	7.86
0.988	4.37	0.82	7.86
1.152	3.59	0.71	7.86
1.317	2.96	0.62	7.86
1.482	2.43	0.54	7.86
1.646	2.00	0.47	7.86

WQM 7.0 Effluent Limits

SWP Basin	Stream Code	Stream Name
18F	42599	Trib 42599 to 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)
1.700	Gulick MHP	PA0090514	0.005	CBOD5	25		
				NH3-N	3.62	7.24	
				Dissolved Oxygen			6