pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Southwest Regional Office
CLEAN WATER PROGRAM

Application Type	**Renewal**	Application No.	**PA0219444**
Facility Type	**Municipal**	APS ID	**1033702**
Major / Minor	**Minor**	Authorization ID	**1345566**

NPDES PERMIT FACT SHEET
INDIVIDUAL SEWAGE

Applicant and Facility Information

Applicant Name	**Markleysburg Borough Fayette County**	Facility Name	**Markleysburg Area STP**
Applicant Address	PO Box 25	Facility Address	Bruceton Road
	Markleysburg, PA 15459-0025		Markleysburg, PA 15459
Applicant Contact	Brian Frazee	Facility Contact	Edgar Harris
Applicant Phone	724-329-1459	Facility Phone	724-966-2278
Client ID	110672	Site ID	608732
Ch 94 Load Status	Not Overloaded	Municipality	Henry Clay Township
Connection Status	No Limitations	County	Fayette
Date Application Received	March 8, 2021	EPA Waived?	Yes
Date Application Accepted	March 11, 2021	If No, Reason	

Purpose of Application: Application for renewal of NPDES Permit.

Summary of Review

The permittee has applied for a renewal of NPDES Permit No. PA0219444. NPDES Permit No. PA0219444 was previously issued by the PA Department of Environmental Protection (DEP) on August 11, 2016. That permit expires on August 31, 2021.

Sewage from this facility is treated with flow equalization, extended aeration, final clarification, chlorination and de-chlorination before discharging to Pinkham Run through outfall 001.

The applicant is currently enrolled in and will continue to use eDMR.

Sewage Sludge is disposed of in Clairton STP

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		Stephanie Conrad / Environmental Engineering Specialist	April 27, 2021
X		Christopher Kriley, P.E. / Program Manager	April 29, 2021

Discharge, Receiving Waters and Water Supply Information

Outfall No.	001	Design Flow (MGD)	.075
Latitude	39º 45' 3"	Longitude	-79º 26' 41"
Quad Name		Quad Code	
Wastewater Description:	Sewage Effluent		
Receiving Waters	Pinkham Run	Stream Code	39381
NHD Com ID	69923289	RMI	0.3
Drainage Area	3.75	Yield (cfs/mi^2)	0.008
Q_{7-10} Flow (cfs)	0.03	Q_{7-10} Basis	Previous Pollution Report
Elevation (ft)		Slope (ft/ft)	
Watershed No.	19-E	Chapter 93 Class.	WWF
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			
PWS Waters		Flow at Intake (cfs)	
PWS RMI		Distance from Outfall (mi)	

Changes Since Last Permit Issuance:

Other Comments:

Compliance History	
Summary of DMRs:	**Between March 2016 and March 2021, the facility has complied with submittal of Discharge Maintenance Reports. During the review period, three effluent limit violations (Type 92A.44) were issued for five exceedances. The majority of the exceedances were for Ammonia-Nitrogen, with the exception being an exceedance for fecal coliform in 2016. All three violations have been administratively closed as of March 24, 2021.**
Summary of Inspections:	**Between March 2016 and March 2021, the facility received three compliance evaluations. Each evaluation resulted in one of the three violations discussed above.**

Other Comments:

Compliance History

DMR Data for Outfall 001 (from March 1, 2020 to February 28, 2021)

Parameter	FEB-21	JAN-21	DEC-20	NOV-20	OCT-20	SEP-20	AUG-20	JUL-20	JUN-20	MAY-20	APR-20	MAR-20
Flow (MGD) Average Monthly	0.04307	0.03961	0.04752	0.03717	0.02940	0.02677	0.02702	0.02974	0.02797	0.04167	0.052	0.05361
pH (S.U.) Minimum	6.8	6.8	7.0	7.1	7.0	7.0	6.7	7.0	6.7	6.7	6.8	6.9
pH (S.U.) Maximum	7.5	7.3	7.2	7.4	7.3	7.2	7.2	7.1	7.2	7.2	7.2	7.2
DO (mg/L) Minimum	7.9	8.2	7.9	8.3	7.9	7.3	7.2	7.7	7.0	7.0	7.4	7.2
TRC (mg/L) Average Monthly	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
TRC (mg/L) Instantaneous Maximum	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
CBOD5 (lbs/day) Average Monthly	0.5	1.0	0.7	0.6	0.4	0.6	0.4	0.5	0.8	0.9	0.7	0.8
CBOD5 (mg/L) Average Monthly	2.0	2.1	2.0	2.2	2.0	2.0	2.0	2.0	2.9	2.3	2.0	2.0
CBOD5 (mg/L) Instantaneous Maximum	2.0	2.1	2.0	2.3	2.0	2.0	2.0	2.0	3.8	2.6	2.0	2.0
BOD5 (lbs/day) Raw Sewage Influent Average Monthly	28.4	24.8	31.7	46.9	42.1	53.4	29.9	55.6	33.2	35.4	31.7	33.2
BOD5 (mg/L) Raw Sewage Influent Average Monthly	103.6	84.5	88.5	126.9	222.7	174.2	149.7	264.6	149.3	100.7	93.6	61.1
BOD5 (mg/L) Raw Sewage Influent Instantaneous Maximum	121.5	100.6	106.1	132.1	290.0	185.0	165.8	302.5	160.3	156.4	104.2	70.4
TSS (lbs/day) Average Monthly	0.7	1.5	1.8	1.8	0.9	1.5	1.0	1.1	1.1	2.1	1.7	3.3

TSS (lbs/day) Raw Sewage Influent Average Monthly	33.6	32.3	34.0	32.6	22.1	38.3	28.4	90.9	31.1	30.1	14.5	30.9
TSS (mg/L) Average Monthly	6.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	6.0
TSS (mg/L) Raw Sewage Influent Average Monthly	127.0	114.0	92.0	84.0	118.0	130.0	150.0	451.0	138.0	87.0	43.0	58.0
TSS (mg/L) Instantaneous Maximum	6.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	7.0
TSS (mg/L) Raw Sewage Influent Instantaneous Maximum	176.0	164.0	96.0	104.0	124.0	184.0	176.0	750.0	168.0	140.0	48.0	82.0
Fecal Coliform (CFU/100 ml) Geometric Mean	1	1	1	2	1	2	1	1	1	1	3	1
Fecal Coliform (CFU/100 ml) Instantaneous Maximum	1	1	1	2	1	6	1	1	1	1	10	1
Total Nitrogen (mg/L) Daily Maximum			17.6									
Ammonia (lbs/day) Average Monthly	0.03	0.06	0.07	0.05	0.06	0.11	0.11	0.06	0.04	0.23	0.07	0.08
Ammonia (mg/L) Average Monthly	0.1	0.2	0.2	0.2	0.4	0.4	0.6	0.3	0.2	0.7	0.2	0.2
Ammonia (mg/L) Instantaneous Maximum	0.1	0.2	0.3	0.2	0.6	0.4	0.6	0.5	0.3	1.2	0.3	0.2
Total Phosphorus (mg/L) Daily Maximum			4.4									

Development of Effluent Limitations

Outfall No. 001 **Design Flow (MGD)** .075
Latitude 39º 45' 4.00" **Longitude** -79º 26' 41.00"
Wastewater Description: Sewage Effluent

Technology-Based Limitations

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

Pollutant	Limit (mg/l)	SBC	Federal Regulation	State Regulation
$CBOD_5$	25	Average Monthly	133.102(a)(4)(i)	92a.47(a)(1)
	40	Average Weekly	133.102(a)(4)(ii)	92a.47(a)(2)
Total Suspended Solids	30	Average Monthly	133.102(b)(1)	92a.47(a)(1)
	45	Average Weekly	133.102(b)(2)	92a.47(a)(2)
pH	6.0 – 9.0 S.U.	Min – Max	133.102(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:

Water Quality-Based Limitations

TRC was re-modeled with the TRC Spreadsheet, and it was determined that a stricter limit should be imposed. A review of eDMR data determined that the facility should be able to comply with the new limit without issue.

The discharge was previously modeled using (WQM 6.3) to evaluate the CBOD5, Ammonia Nitrogen and Dissolved Oxygen parameters. Because there have been no changes to the discharge or receiving stream, those limits will be reimposed. The modeling results show technology based effluent limitations for CBOD5 are appropriate. The modeling results also confirm that Ammonia-Nitrogen limitations are necessary to meet in-stream water quality criterion.

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

Parameter	Limit (mg/l)	SBC	Model
NH_3N	2.5	Average Monthly	WQM6.3
TRC	0.04	Average Monthly	TRC Spreadsheet

Comments:

Best Professional Judgment (BPJ) Limitations

A Dissolved Oxygen minimum limitation of 4.0 mg/L will be implemented based on the standard in 25 PA Code Chapter 93 and best professional judgment.

Anti-Backsliding

Section 402(o) of the Clean Water Act (CWA), enacted in the Water Quality Act of 1987, establishes anti-backsliding rules governing two situations. The first situation occurs when a permittee seeks to revise a Technology-Based effluent limitation based on BPJ to reflect a subsequently promulgated effluent guideline which is less stringent. The second situation addressed by Section 402(o) arises when a permittee seeks relaxation of an effluent limitation which is based upon a State treatment standard of water quality standard.

Previous limits can be used pursuant to EPA's anti-backsliding regulation 40 CFR 122.44 **(l) Reissued permits. (1) Except as provided in paragraph (l)(2) of this section when a permit is renewed or reissued. Interim effluent limitations, standards or conditions must be at least as stringent as the final effluent limitations, standards, or conditions in the previous permit (unless the circumstances on which the previous permit was based have materially and substantially changed since the time the permit was issued and would constitute cause for permit modification or revocation and reissuance under §122.62). (2) In the case of effluent limitations established on the basis of Section 402(a)(1)(B) of the CWA, a permit may not be renewed, reissued, or modified on the basis of effluent guidelines promulgated under section 304(b) subsequent to the original issuance of such permit, to contain effluent limitations which are less stringent than the comparable effluent limitations in the previous permit.**

The facility is not seeking to revise the previously permitted effluent limits.

Additional Considerations

The stream is not impaired for nutrients, therefore, annual sampling for phosphorus and nitrogen will again be imposed per 25 PA Code §92a.6.

Sewage discharges will include monitoring, at a minimum, for E. Coli, in new and reissued permits, with a monitoring frequency of 1/quarter for design flows >= 0.05 and < 1 MGD.

Mass Loading

Mass loading limits are applicable for publicly owned treatment works. Current policy requires average monthly mass loading units be established for CBOD5, TSS and NH3-N. Average monthly mass loading limits (lbs./day) are based on the formula: design flow (MGD) x concentration limit (mg/L) x conversion Factor (8.34)

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	XXX	XXX	XXX	XXX	XXX	1/week	Measured
pH (S.U.)	XXX	XXX	6.0 Inst Min	XXX	XXX	9.0	3/week	Grab
DO	XXX	XXX	4.0 Inst Min	XXX	XXX	XXX	3/week	Grab
TRC	XXX	XXX	XXX	0.04	XXX	0.15	3/week	Grab
CBOD5	15.6	XXX	XXX	25	XXX	50	2/month	Grab
BOD5 Raw Sewage Influent	Report	XXX	XXX	Report	XXX	Report	2/month	Grab
TSS Raw Sewage Influent	Report	XXX	XXX	Report	XXX	Report	2/month	Grab
TSS	18.8	XXX	XXX	30	XXX	60	2/month	Grab
Fecal Coliform (No./100 ml) Oct 1 - Apr 30	XXX	XXX	XXX	2000 Geo Mean	XXX	10000	2/month	Grab
Fecal Coliform (No./100 ml) May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	XXX	1000	2/month	Grab
E. Coli (No./100 ml)	XXX	XXX	XXX	XXX	XXX	Report	1/quarter	Grab
Total Nitrogen	XXX	XXX	XXX	XXX	Report Daily Max	XXX	1/year	Grab
Ammonia Nov 1 - Apr 30	4.7	XXX	XXX	7.5	XXX	15.0	2/month	Grab

Outfall 001, Continued (from 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		
Ammonia May 1 - Oct 31	1.6	XXX	XXX	2.5	XXX	5.0	2/month	Grab
Total Phosphorus	XXX	XXX	XXX	XXX	Report Daily Max	XXX	1/year	Grab

Compliance Sampling Location: at Outfall 001

Other Comments:

Copy of TRC_CALC

TRC EVALUATION

Input appropriate values in A3:A9 and D3:D9

0.03	= Q stream (cfs)	0.5	= CV Daily
0.075	= 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)		=Decay Coefficient (K)

Source	Reference	AFC Calculations	Reference	CFC Calculations
TRC	1.3.2.iii	WLA afc = 0.101	1.3.2.iii	WLA cfc = 0.091
PENTOXSD TRG	5.1a	LTAMULT afc = 0.373	5.1c	LTAMULT cfc = 0.581
PENTOXSD TRG	5.1b	LTA_afc= 0.038	5.1d	LTA_cfc = 0.053

Source		Effluent Limit Calculations	
PENTOXSD TRG	5.1f	AML MULT = 1.231	
PENTOXSD TRG	5.1g	AVG MON LIMIT (mg/l) = 0.047	AFC
		INST MAX LIMIT (mg/l) = 0.152	

WLA afc	**(.019/e(-k*AFC_tc)) + [(AFC_Yc*Qs*.019/Qd*e(-k*AFC_tc))...** **...+ Xd + (AFC_Yc*Qs*Xa/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*Xa/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)**

POLLUTION REPORT December 15, 2008

(I) Project Description — New Discharge / Existing Discharge (X) / Change / Preliminary

A. NPDES Application/Permit No. PA 0219444
Part II Permit Nos. 2603401

B. Applicant, Case Name or Permittee: Borough of Markleysburg
Municipality: Henry Clay Township
County: Fayette

C. Type Waste
[X] Sewage
[ ] Industrial
[ ] Mine

D. Source and characteristics
Domestic wastewater

E. USGS Quad : Ohiopyle and Friendsville

F. Latitude (or in. N) 39 45 03
Longitude (or in. W) 79 26 40

(II) Water Uses and Criteria

A. Receiving waters Pinkham Run — Stream Code 39382
Chapter 93 classification WWF — R.M.I. 0.3
D.A. 3.75 sq. mi. — Yield 0.008 cfs/sq.mi
Flow 0.0300 cfs. — Based on data from Previous pollution report
Elevation ____ ft.

Exceptions to standard water use lists :
Add ____
Delete ____

Water Quality Criteria-Exceptions to Specific Criteria :
Add ____
Delete ____

wrong Stream Code

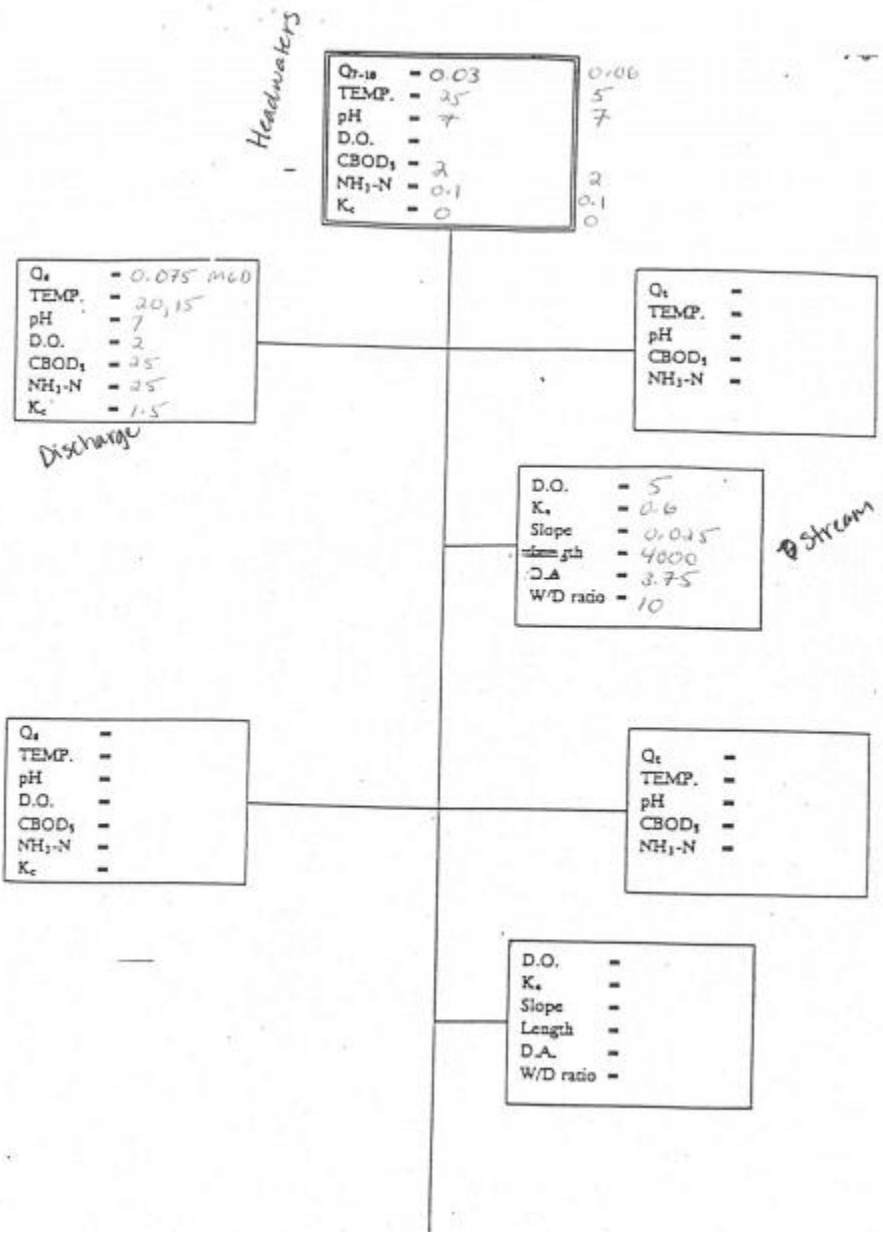
Impoundment ____
Special Downstream Uses : ____

B. Secondary Waters Hall Run — R.M.I. 4.57
Distance from discharge 4.87 mi. — Ch. 93 classification wwf
D.A. ____ sq. mi. — Yield ____ cfs/sq.mi
Flow ____ cfs. — Based on data from DEP Stream Directory
Elevation ____ ft. — Stream Code 39369

Exceptions to standard water use lists :
Add ____
Delete ____

Water Quality Criteria-Exceptions to Specific Criteria :
Add ____
Delete ____

Impoundment ____
Special Downstream Uses : ____
Downstream PWS : location Ohiopyle Municipal Waterworks
distance from discharge 20 mi. — intake 0.13 mgd.
stream flow at intake ____ cfs.


Headwaters
Q_{7-10} = 0.03
TEMP. = 25
pH = 7
D.O. =
$CBOD_5$ = 2
NH_3-N = 0.1
K_c = 0
0.06
5
7
2
0.1
0
Q_d = 0.075 MGD
TEMP. = 20, 15
pH = 7
D.O. = 2
$CBOD_5$ = 25
NH_3-N = 25
K_c = 1.5
Discharge
Q_t =
TEMP. =
pH =
$CBOD_5$ =
NH_3-N =
D.O. = 5
K_a = 0.6
Slope = 0.025
Length = 4000
D.A = 3.75
W/D ratio = 10
B Stream
Q_d =
TEMP. =
pH =
D.O. =
$CBOD_5$ =
NH_3-N =
K_c =
Q_t =
TEMP. =
pH =
$CBOD_5$ =
NH_3-N =
D.O. =
K_a =
Slope =
Length =
D.A. =
W/D ratio =

Summer Period

FILE: c:\63model\sum3.wqm

Default Data

a. Stream Values

1	Q1-10/Q7-10 ratio	.64
2	Q30-10/Q7-10 ratio	2.23 – Updated.
3	Temperature	25
4	pH	7
5	C-BOD5	2
6	NH3-N	.1
7	D.O. Saturation (%)	.85
8	D.O. Goal	5
9	Width/Depth ratio	10
10	KC...(Headwaters only!)	0
11	KN	.6

b. Discharge Values (30-day avgs.)

12	C-BOD5	25
13	NH3-N	25
14	Effluent D.O.	2
15	Effluent Temp	20
16	KC	1.5
17	Balanced Technology(1=y 0=no)	0

FILE: c:\63model\sum3.wqm

REACH # 1
Headwaters and Tributary data

No. of Reaches : 1

Rh	Q7-10 (cfs)	T (c)	pH (su)	DO (mg/l)	CBOD5 (mg/l)	NH3-N (mg/l)
HW	0.0028	25	7	7.12	2	.1
1	0.0000					

Q7-10 updated From Low-Flow Statistics For George's Creek at SMITHFIELD.

(WQAM63.EXE) Release 1.2 06-16-2003 15:01:26

FILE: c:\63model\sum4.wqm

REACH # 1
Headwaters and Tributary data

No. of Reaches : 1

Rh	Q7-10 (cfs)	T (c)	pH (su)	DO (mg/l)	CBOD5 (mg/l)	NH3-N (mg/l)
HW	0.0300	25	7	7.12	2	.1
1	0.0000					

FILE: c:\63model\sum4.wqm

DISCHARGE # 1
Discharger Data
Q7-10 Design Conditions

Rh	FLOW (MGD)	T (c)	pH (su)	DO (mg/l)	CBOD5 (mg/l)	NH3-N (mg/l)	KC (1/days)
1	0.0750	20	7	5	25	25	1.5

(WQAM63.EXE) Release 1.2 06-19-2003 15:04:53

FILE: c:\63model\sum4.wqm

REACH # 1
Reach Characteristics

Rh	D.O. GOAL	KN (/D)	RCH. SL. (FT/FT)	RCH. LEN. (FT.)	DRAIN AREA (MI^2)	W/D
1	5	.6	0.02500	4000	3.75	10

(WQAM63.EXE) Release 1.2 06-19-2003 15:05:23

FILE: c:\63model\sum4.wqm

REACH # 1
Reach Characteristics

Rh	KR (/D)	TT (Days)
1	0	0

FILE: c:\63model\sum4.wqm

NH3-N Discharge Allocations at Q30-10 (EMPR)

DIS	Q (mgd)	BASE. CONC. (mg/l)	MULT. CONC. (mg/l)	CRIT. RCH.	PCT. RED. (%)	NH3-N CRIT. (mg/l)
1	0.0750	2.59	2.59	0	0	1.68

(WQAM63.EXE) Release 1.2 06-19-2003 15:05:53

FILE: c:\63model\sum4.wqm

NH3-N Discharge Allocations at Q1-10 (EMPR)

DIS	Q (mgd)	BASE. CONC. (mg/l)	MULT. CONC. (mg/l)	CRIT. RCH.	PCT. RED. (%)	NH3-N CRIT. (mg/l)
1	0.0750	10.69	10.69	0	0	9.19

(WQAM63.EXE) Release 1.2 06-19-2003 15:05:57

FILE: c:\63model\sum4.wqm

D.O. Allocations (EMPR)

DIS #	Q (MGD)	---NH3-N--- IND. Conc. (mg/l)	CUM. Conc. (mg/l)	---CBOD5---- IND. Conc. (mg/l)	CUM. Conc. (mg/l)	CRIT. RCH.	PCT. REM. (%)
1	0.0750	2.6	2.6	25	25	0	0

(WQAM63.EXE) Release 1.2 06-19-2003 15:06:05

FILE: c:\63model\sum4.wqm

(Total)Discharge = .075 MGD

Temp	=	21	pH	=	7	Width	= 4.89
CBOD-5	=	20.27	NH3-N	=	2.09	Depth	= 0.49
D.O.	=	5.44	D.O. Goal	=	5	Velocity	= 0.061
KC'	=	1.443	KN	=	.6	W/D RATIO	= 10
KR	=	12.543	(OWENS)				

Dis. 1 Rch. 1 Trvl Time: .757

Tr.Tm. (Days)	CBOD-5 (mg/l)	NH3-N (mg/l)	D.O. (mg/l)
0.076	18.08	1.99	5.21
0.151	16.12	1.89	5.37
0.227	14.38	1.80	5.65
0.303	12.82	1.71	5.95
0.379	11.43	1.63	6.24
0.454	10.20	1.55	6.51
0.530	9.09	1.48	6.75
0.606	8.11	1.41	6.97
0.682	7.23	1.34	7.12
0.757	6.45	1.28	7.12

(WQAM63.EXE) Release 1.2 06-19-2003 15:06:15

FILE: c:\63model\sum4.wqm

Effluent Limitations Display

DIS #	Q MGD	NH3-N TOX. 1 DAY	30 DAY	DISS. OXYGEN C-BOD5 30-DAY	NH3-N 30-DAY	EFF. D.O.
1	.075	5.2	2.6	25	2.6	5

Impose NH_3 limit of 2.5 mg/L

(WQAM63.EXE) Release 1.2 06-19-2003 15:06:20

FILE: c:\63model\sum4.wqm

D.O. Allocations (EMPR)

DIS #	Q	---NH3-N---		---CBOD5----		CRIT.	PCT.
		IND. Conc.	CUM. Conc.	IND. Conc.	CUM. Conc.	RCH.	REM.
	(MGD)	(mg/l)	(mg/l)	(mg/l)	(mg/l)		(%)
1	0.0750	2.6	2.6	25	25	0	0

(WQAM63.EXE) Release 1.2 06-19-2003 15:07:24

WINTER PERIOD

FILE: c:\63model\wint3.wqm

Default Data

a. Stream Values

1	Q1-10/Q7-10 ratio	.64
2	Q30-10/Q7-10 ratio	2.23 – Updated
3	Temperature	25
4	pH	7
5	C-BOD5	2
6	NH3-N	.1
7	D.O. Saturation (%)	.85
8	D.O. Goal	5
9	Width/Depth ratio	10
10	KC...(Headwaters only!)	0
11	KN	.6

b. Discharge Values (30-day avgs.)

12	C-BOD5	25
13	NH3-N	25
14	Effluent D.O.	2
15	Effluent Temp	20
16	KC	1.5
17	Balanced Technology(1=y 0=no)	0

(WQAM63.EXE) Release 1.2 06-16-2003 14:56:24

Q_{7-10} updated From Low-Flow Statistics For George's Creek at Smithfield.

FILE: c:\63model\wint3.wqm

REACH # 1
Headwaters and Tributary data

No. of Reaches : 1

Rh	Q7-10 (cfs)	T (c)	pH (su)	DO (mg/l)	CBOD5 (mg/l)	NH3-N (mg/l)
HW	0.0600	5	7	10.82	2	.1
1	0.0000					

FILE: c:\63model\wint3.wqm

Stream Characteristics

Rh	Q7-10 (cfs)	T (c)	pH (su)	DO (mg/l)	CBOD5 (mg/l)	NH3-N (mg/l)
1	.06	5	7	10.82	2	.1

Q 1-10/Q 7-10 = .64
Q 30-10/Q 7-10 = 2.23

(WQAM63.EXE) Release 1.2 06-19-2003 15:08:43

FILE: c:\63model\wint3.wgm

DISCHARGE # 1
Discharger Data
Q7-10 Design Conditions

Rh	FLOW (MGD)	T (c)	pH (su)	DO (mg/l)	CBOD5 (mg/l)	NH3-N (mg/l)	KC (1/days)
1	0.0750	15	7	5	25	25	1.5

(WQAM63.EXE) Release 1.2 06-19-2003 15:09:07

FILE: c:\63model\wint3.wqm

REACH # 1
Reach Characteristics

Rh	D.O. GOAL	KN (/D)	RCH. SL. (FT/FT)	RCH. LEN. (FT.)	DRAIN AREA (MI^2)	W/D
1	5	.6	0.02500	4000	3.75	10

FILE: c:\63model\wint3.wqm

REACH # 1
Reach Characteristics

Rh	KR (/D)	TT (Days)
1	0	0

(WQAM63.EXE) Release 1.2 06-19-2003 15:09:41

FILE: c:\63model\wint4.wqm

NH3-N Discharge Allocations at Q30-10 (EMPR)

DIS	Q (mgd)	BASE. CONC. (mg/l)	MULT. CONC. (mg/l)	CRIT. RCH.	PCT. RED. (%)	NH3-N CRIT. (mg/l)
1	0.0750	8.67	8.67	0	0	4.08

FILE: c:\63model\wint4.wqm

NH3-N Discharge Allocations at Q1-10 (EMPR)

DIS	Q (mgd)	BASE. CONC. (mg/l)	MULT. CONC. (mg/l)	CRIT. RCH.	PCT. RED. (%)	NH3-N CRIT. (mg/l)
1	0.0750	22.51	22.51	0	0	16.94

(WQAM63.EXE) Release 1.2 06-19-2003 15:10:12

FILE: c:\63model\wint4.wqm

D.O. Allocations (EMPR)

DIS #	Q (MGD)	---NH3-N--- IND. Conc. (mg/l)	CUM. Conc. (mg/l)	---CBOD5---- IND. Conc. (mg/l)	CUM. Conc. (mg/l)	CRIT. RCH.	PCT. REM. (%)
1	0.0750	8.7	8.7	25	25	0	0

(WQAM63.EXE) Release 1.2 06-19-2003 15:10:24

FILE: c:\63model\wint4.wqm

(Total)Discharge = .075 MGD

Temp	= 11.6	pH	= 7	Width	=	5.09
CBOD-5	= 17.16	NH3-N	= 5.77	Depth	=	0.51
D.O.	= 6.98	D.O. Goal	= 5	Velocity	=	0.068
KC'	= 1.416	KN	= .6	W/D RATIO	=	10
KR	= 12.468 (OWENS)					

Dis. 1 Rch. 1 Trvl Time: .682

Tr.Tm. (Days)	CBOD-5 (mg/l)	NH3-N (mg/l)	D.O. (mg/l)
0.068	16.07	5.65	7.74
0.136	15.05	5.53	8.14
0.205	14.09	5.41	8.38
0.273	13.20	5.29	8.55
0.341	12.36	5.18	8.69
0.409	11.57	5.07	8.81
0.478	10.84	4.97	8.92
0.546	10.15	4.86	9.02
0.614	9.51	4.76	9.11
0.682	8.90	4.66	9.20

(WQAM63.EXE) Release 1.2 06-19-2003 15:10:34

FILE: c:\63model\wint4.wqm

DISCHARGE CHARACTERISTICS

END OF REACH 1

(TOTAL) FLOW-MGD.....: .075
TEMPERATURE.....: 15
pH.....: 7
DISSOLVED OXYGEN (mg/l)....: 8.399999
C-BOD5 (mg/l).....: 12.5
NH3-N (mg/l).....: 7
KC (1/Day).....: 1.5

(WQAM63.EXE) Release 1.2 06-19-2003 15:10:40

FILE: c:\63model\wint4.wqm

Effluent Limitations Display

DIS #	Q MGD	NH3-N TOX. 1 DAY	30 DAY	DISS. OXYGEN C-BOD5 30-DAY	NH3-N 30-DAY	EFF. D.O.
1	.075	17.3	8.7	25	8.7	5

Impose NH_3 Limit of 7.5 mg/L which 3 times the Summer limit of 2.5 mg/L and Less than model limit of 8.7 mg/L. Impose 7.5 mg/L

(WQAM63.EXE) Release 1.2 06-19-2003 15:10:44

FILE: c:\63model\wint4.wqm

D.O. Allocations (EMPR)

DIS #	Q	---NH3-N--- IND. Conc. (mg/l)	CUM. Conc. (mg/l)	---CBOD5---- IND. Conc. (mg/l)	CUM. Conc. (mg/l)	CRIT. RCH.	PCT. REM. (%)
	(MGD)						
1	0.0750	8.7	8.7	25	25	0	0

(WQAM63.EXE) Release 1.2 06-19-2003 15:10:48

Fecal Coliform Evaluation

Warm Period:

Title 25, Chapter 95, Section 92.2c(b)(2) defines effective disinfection. Effective disinfection to control disease-producing organisms shall be the production of an effluent which will contain a concentration of not greater than 200/100 milliliters of fecal coliform organisms as a geometric average.

Cold Period

Qs (cfs) =	0.030		
Qw (mgd) =	0.075	therefore, Qw (cfs) =	0.116
Cs (#/100 ml) :	200	If no data, assume 10 % of criteria	
Csw (#/100 ml) :	2000		
Qsw (cfs) =	0.146		

solve for Cw

Cw = (Csw * Qsw) - (Qs * Cs) / Qw

Cw (#/100 ml) = 2,465

Impose limit of 2,000/100ml