VPDES PERMIT FACT SHEET

This document gives pertinent information concerning the **reissuance** of the VPDES permit listed below. This permit is being processed as a **major**, **municipal** permit. The effluent limitations contained in this permit will maintain the Water Quality Standards of 9VAC25-260-00 *et seq*. The discharge results from the operation of the Pepper's Ferry Regional Wastewater Treatment Authority's wastewater treatment works (SIC Code 4952). This permit action consists of reissuing the permit for a period of 5 years and establishing effluent limits for pH, biochemical oxygen demand (BOD_5), total suspended solids (TSS), dissolved oxygen (DO), *E. coli*, and ammonia. This permit also contains requirements for flow and toxicity monitoring and the treatment of sewage sludge for land application of biosolids. The permit contains limits and monitoring for 9.0 MGD and 18.0 MGD design flows.

1. **FACILITY NAME AND ADDRESS:**
   Pepper's Ferry Regional Wastewater Treatment Authority (PFRWTA) Wastewater Treatment Plant
   P.O. Box 2950
   Radford, VA 24143-2950
   LOCATION: 7797 Mason Street in Pulaski County

2. **PERMIT NUMBER:** VA0062685 **EXISTING PERMIT EXPIRATION DATE:** September 30, 2014

3. **OWNER AND CONTACT**

Name:	Pepper's Ferry Regional Wastewater Treatment Authority (PFRWTA)
Contact:	R. Clarke Wallcraft
Title:	Executive Director
Phone:	(540) 639-3947
E-mail:	cwallcraft@jetbroadband.com

4. **APPLICATION COMPLETE DATE:** January 21, 2014
   PERMIT DRAFTED BY: Bob Tate, BRRO - Roanoke **DATE:** April 9, 2014; revised September 23, 2014
   REVIEWED BY: Kirk Batsel, BRRO - Lynchburg **DATE:** May 2, 2014
   PUBLIC NOTICE DATES: from June 22 through July 21, 2014

5. **RECEIVING WATERS INFORMATION**

Receiving Stream:	New River
River Mile:	73.6
Basin:	New River
Subbasin:	N/A
Section:	2a
Class:	IV
Special Standards:	PWS, v
1-Day, 30-Year Low Flow (1Q30):	409 MGD*
1-Day, 10-Year Low Flow (1Q10):	436 MGD*
7-Day, 10-Year Low Flow (7Q10):	546 MGD*
30-Day, 10-Year Low Flow (30Q10):	633 MGD*
30-Day, 5-Year Low Flow (30Q5):	712 MGD*
1-Day, 10-Year High Flow (HF 1Q10):	515 MGD* (January through May)
7-Day, 10-Year High Flow (HF 7Q10):	758 MGD* (January through May)
30-Day, 10-Year High Flow (HF 30Q10):	1053 MGD* (January through May)
Harmonic Mean Flow (HM):	1506 MGD* (January through May)
Tidal?	No
On 303(d) list?	Yes – for PCB in fish tissue**

*flow frequencies documentation is in APPENDIX A
**impairment documentation is in APPENDIX A

6. **OPERATOR LICENSE REQUIREMENTS:** Class I

7. **RELIABILITY CLASS:** Class I

8. **PERMIT CHARACTERIZATION:**
   ( ) Private ( ) Federal ( ) State (X) POTW ( ) PVOTW
   ( ) Possible Interstate Effect ( ) Interim Limits in Other Document

9. **WASTEWATER TREATMENT SYSTEM:** A schematic diagram and a process flow narrative of the PFRWTA facility is in APPENDIX B. The facility receives domestic and industrial wastewaters from Pulaski County, Montgomery County, the City of Radford, the Town of Dublin, and the Town of Pulaski. Design treatment capacity is 9.0 MGD. This permit also contains limits and monitoring an 18.0 MGD expanded facility. Expansion is not anticipated in the near future. The facility uses the following treatment processes: screening and grit removal (at the New River Pump Station), influent flow measurement, primary sedimentation, flow equalization, secondary treatment (activated sludge process), disinfection (ultraviolet radiation), and effluent flow measurement. Treated wastewater is discharged to the New River through Outfall 001. The site visit report in APPENDIX B provides more detail. Sludge treatment is briefly described in the next section.

10. **SEWAGE SLUDGE USE OR DISPOSAL:** A schematic diagram including the sludge treatment system is in APPENDIX B. Sludge treatment is provided by dissolved air flotation thickening, anaerobic digestion, and dewatering (filter belt press). The facility produces Class B biosolids for land application on fields in Pulaski County. The backup method of sludge disposal is a municipal solid waste landfill, the New River Solid Waste Management Area (landfill permit number 548). The Sludge Management Plan (SMP), submitted with the application, is approved with this permit reissuance. The site visit report in APPENDIX B provides more detail.

11. **DISCHARGE LOCATION DESCRIPTION:** latitude N 37° 10’ 59”, longitude W 80° 33’ 43” (application) APPENDIX B contains a copy of 7.5 minute series USGS topographic map for Radford North, Virginia indicating the discharge location (Outfall 001) on the New River (Water Body ID# VAW-N22R). Because the discharge location is over 1 mile from the treatment facility, all samples for Outfall 001 are taken at the facility after all treatment, in accordance with the O&M Manual.

12. **MATERIAL STORAGE:** N/A – registered for the VPDES Industrial Storm Water Discharges General Permit

13. **AMBIENT WATER QUALITY INFORMATION:**

    The receiving water body is a segment of the New River within Section 2a of the New River basin as listed in the State Water Control Board’s Water Quality Standards, River Basin Section Tables (9VAC25-260-540). Section 2a is designated Class IV (mountainous zones waters) with special standards for Public Water Supply (PWS) and for temperature (v). Class IV criteria (9VAC25-260-50) are:

    DO minimum 4.0 mg/L;
    DO daily average 5.0 mg/L;
    pH 6.0 – 9.0 SU;
    temperature maximum 31°C.

    The “v” special standard (9VAC25-260-310.v) establishes a maximum temperature of 29°C that supercedes the Class IV temperature criterion (31°C).

    The DEQ Office of Water Quality Assessments and Planning (WQAP) prepared a Flow Frequency Determination Memorandum (dated April 28, 1999) for this facility. Using this analysis and updated critical flows for the reference gage, revised flow frequencies memos were developed for permit reissuances in 2004, 2009, and 2014.

Flow determination methodology is explained in the latest memo, which is in APPENDIX A.

This segment of the New River is listed in the current 303(d)/305(b) Integrated Report for PCB. APPENDIX A contains a copy of 2012 Impaired Waters fact sheet N29R-01-PCB.

Receiving stream data used for the permit's limitations analyses were collected from STORET station 9-NEW081.72 at the Route 11 Bridge in Radford, VA. Temperature and pH data were from the latest 10 years (2004-2013). Hardness data were more limited (2000-2003). Background concentrations for water quality standards parameters were from various collection periods due to availability. Receiving stream data and statistics are in APPENDIX A.

14. **ANTIDEGRADATION REVIEW & COMMENTS:** Tier 2

The State Water Control Board's Water Quality Standards includes an antidegradation policy (9VAC25-260-30). All state surface waters are provided one of three levels of antidegradation protection. For Tier 1 or existing use protection, existing uses of the water body and the water quality to protect these uses must be maintained. Tier 2 water bodies have water quality that is better than the water quality criteria standards. Significant lowering of the water quality of Tier 2 waters is not allowed without an evaluation of the economic and social impacts. Tier 3 water bodies are exceptional waters and are so designated by regulatory amendment. The antidegradation policy prohibits new or expanded discharges into exceptional waters.

The antidegradation review begins with a Tier determination. The current 303(d)/305(b) Integrated Report indicates the receiving segment of the New River does not support the fish consumption use. The cause is "PCB in Fish Tissue." (APPENDIX A contains the 2012 Impaired Waters fact sheet.) A DEQ Water Quality Programs Memo dated February 8, 2005 instructs to "Exclude fish consumption advisories, bans, and prohibitions from Tier evaluation – i.e. such advisories, bans, and prohibitions do not constitute grounds for a Tier 1 determination." As there are no other identified impairments or relevant considerations, the New River at the discharge location is assumed to be Tier 2. As a Tier 2 water, no significant degradation of existing quality is allowed without an evaluation of the economic and social impacts.

The facility's original and current design flow is 9.0 MGD. Indefinite plans for future expansion resulted in previous permits containing limits and monitoring requirements for 9.0 and 18.0 MGD design flows. This permit also contains 9.0 and 18.0 MGD tiers. Both sets of limits are in compliance with antidegradation requirements set forth in the 9VAC25-260-30. Based on the existing water quality, any expanded discharge must maintain the existing uses of the water body and the WQS criteria for surface water. If the permit limitations for 18.0 MGD do not become effective before the expiration date of this permit, limitations for an expanded facility could be subject to a new antidegradation evaluation in accordance with Guidance Memorandum (GM00-2011) based on the water quality tier at that time.

15. **SITE VISIT:** The facility was visited for permit reissuance on February 7, 2014 by Bob Tate. A copy of the site visit report is included in APPENDIX B.

16. **EFFLUENT SCREENING & LIMITATION DEVELOPMENT**

In accordance with the previous VPDES permit, effluent has been monitored for flow, pH, BOD_5, TSS, DO, TRC, and *E. coli*. Effluent data from application Form 2A, daily operation logs, and DMRs were reviewed and used in permit development. Effluent temperature and pH data for the Freshwater Water Quality Criteria / Wasteload Allocation Analysis (WQC/WLA) spreadsheets came from January – December 2013 daily operation

logs; hardness came from application monitoring and toxicity testing. Effluent data summaries in APPENDIX C contain effluent data from DMRs, daily operation logs, and other monitoring.

Effluent limitations and monitoring requirements are determined by applying Virginia's Water Quality Standards (9VAC25-260 *et seq*), Federal Effluent Guidelines 40 CFR 133, DEQ Guidance Memo 00-2011, and the VPDES Permit Manual. Final effluent limitations, monitoring frequencies, and their bases are in the table below. Discussion of specific parameters and their limitations follow. The results of limitations analyses, including the stream-effluent mixing (MIX), two WQC/WLA spreadsheets, and limitation determination results (STATS) are in APPENDIX D. The spreadsheet for original/current 9.0 MGD design flow analyses is DEQ's current Version 2b. "Non-antidegradation" wasteload allocations are used for 9.0 MGD analyses. The spreadsheet for expanded 18.0 MGD design flow analyses is a version developed at DEQ's Valley Regional Office (VRO). Antidegradation wasteload allocations are used for 18.0 MGD analyses.

EFFLUENT LIMITATIONS AND MONITORING							
PARAMETER	**BASIS FOR LIMITS**	**EFFLUENT LIMITATIONS**				**MONITORING REQUIREMENTS**	
		Monthly Average	Max. Weekly Average	Minimum	Maximum	Frequency	Sample Type
Flow (9 & 18 MGD)	NA	NL (MGD)	NA	NA	NL (MGD)	Continuous	TIRE
pH (9 & 18 MGD)	1, 2	NA	NA	6.0 SU	9.0 SU	1/day	Grab
BOD_5 (9 MGD)	1, 4	30 mg/l 1022 kg/d	45 mg/l 1533 kg/d	NA	NA	1/day	24 HC
BOD_5 (18 MGD)	1, 4	30 mg/l 2044 kg/d	45 mg/l 3066 kg/d	NA	NA	1/day	24 HC
TSS (9 MGD)	1	30 mg/l 1022 kg/d	45 mg/l 1533 kg/d	NA	NA	1/day	24 HC
TSS (18 MGD)	1	30 mg/l 2044 kg/d	45 mg/l 3066 kg/d	NA	NA	1/day	24 HC
DO (9 & 18 MGD)	2, 4	NA	NA	6.0 mg/L	NA	1/day	Grab
E. coli (9 & 18 MGD)	2	126 CFU/100 ml (geometric mean)	NA	NA	NA	1/day 10 am to 4 pm	Grab
Ammonia-N June-December (18 MGD)	2	10 mg/L	12 mg/L	NA	NA	1/day	24 HC
toxicity (9 MGD)	NA	NA	NA	NA	NL (TU_c)	annually	24 HC
toxicity (18 MGD)	NA	NA	NA	NA	NL (TU_c)	quarterly and possibly annually	24 HC

NA – Not Applicable; NL – No Limitations; TIRE – Totaling, Indicating, Recording Equipment; 24 HC – 24-hour composite
BASIS FOR LIMITS codes:

1. Technology-based Limits – 40 CFR 133
2. Water Quality-based Limits – 9VAC25-260 *et seq*
3. Best Professional Judgment-based Limits
4. Other – WQMP, Stream Model

Flow: This permit contains no flow limit but requires flow to be measured on a continuous basis with totalizing, indicating and recording equipment (TIRE). The current treatment design capacity is 9 MGD, as in the previous permit and the permittee's application for permit reissuance. The permit includes limitations and monitoring for an 18 MGD tier.

pH: Limits are 6.0 S.U. minimum and 9.0 S.U. maximum, unchanged from the previous permit. 9VAC25-260-50 (Virginia Water Quality Standards) and 40 CFR 133 (Federal Effluent Guidelines' secondary treatment requirements) are the bases for these limits. Monitoring is daily by grab sample per MN-2 A.4, unchanged from the previous permit.

Biochemical Oxygen Demand$_5$ (BOD$_5$): Concentration limits are 30 mg/L monthly average and 45 mg/L maximum weekly average. These concentration limits apply to 9 MGD and 18 MGD design flows. DEQ's Regional Model for Free Flowing Streams (version 4.11) verifies the limits' appropriateness. DO model documentation is in APPENDIX E. Loading limits are 1022 kg/day monthly average and 1533 kg/day maximum weekly average for 9 MGD design flow, and are 2044 kg/day monthly average and 3066 kg/day maximum weekly average for 18 MGD design flow. All limits are unchanged from the previous permit. 40 CFR 133 (Federal Effluent Guidelines' secondary treatment requirements) is the basis for these limits. Monitoring is daily by 24-hour composite sampling per MN-2 A.4, unchanged from the previous permit.

Total Suspended Solids (TSS): Concentration limits are 30 mg/L monthly average and 45 mg/L maximum weekly average. These concentration limits apply to 9 MGD and 18 MGD design flows. Loading limits are 1022 kg/day monthly average and 1533 kg/day maximum weekly average for 9 MGD design flow, and are 2044 kg/day monthly average and 3066 kg/day maximum weekly average for 18 MGD design flow. All limits are unchanged from the previous permit. 40 CFR 133 (Federal Effluent Guidelines secondary treatment requirements) is the basis for these limits. Monitoring is daily by 24-hour composite sampling per MN-2 A.4, unchanged from the previous permit.

Dissolved Oxygen (DO): The limit is a minimum of 6.0 mg/L and is unchanged from the previous permit. The limit applies to 9 MGD and 18 MGD design flows. The limit's bases are 9VAC25-260-50 (Virginia Water Quality Standards) and DEQ's Regional Model for Free Flowing Streams, version 4.11 (model). The model verifies the limit's appropriateness. DO model documentation is in APPENDIX E. Monitoring is daily by grab sample per MN-2 A.4, unchanged from the previous permit.

***E. coli*:** The limit is a monthly average of 126 colony forming units (CFU) per 100 ml of effluent, calculated as geometric mean. Monitoring is daily between 8:00 AM and 4:00 PM per MN-2 A.4. The limit is based on current water quality criteria for bacteria (9VAC25-260-170), which specify a geometric mean of 126 CFU/100 mL. Ultraviolet disinfection replaced chlorine disinfection in July, 2012, changing the monitoring frequency from two per month to daily.

Ammonia: There are no ammonia limits for the 9 MGD tier. However, the 18 MGD tier has the following limits during June-December (low flow conditions): 10 mg/L monthly average and 12 mg/L maximum weekly average. These limits are unchanged from the previous permit. Reasonable potential water quality analyses in accordance with GM 00-2011 are used to evaluate the need for limits. APPENDIX D contains STATS printouts for both 9 MGD and 18 MGD analyses. Daily 24-hour composite monitoring is required per MN-2 A.4.

Whole Effluent Toxicity (WET) Program:

A WET program is needed because design flow is greater than 1 MGD and because of the pretreatment program (per DEQ Water Division's Toxic Management Program Implementation Guidance). The WET program addresses requirements set forth in 9VAC25-31-220 D.1.b. WET limits are not needed to protect water quality, as determined by STATS. APPENDIX F contains WET documentation for permit reissuances in 2014, 2009, and 2004.

Toxicity testing requirements for 9 MGD operation are generally unchanged from the previous permit. Annual

chronic toxicity testing is required. Chronic toxicity testing requirements for an 18.0 MGD facility are explicit in this permit. Testing would be up to ten quarters and any following twelve-month periods. The required tests for both 9 and 18 MGD are:

3-brood static renewal survival and reproduction tests using *Ceriodaphnia dubia* (water fleas);

7-day static renewal survival and growth tests using *Pimephales promelas* (fathead minnows).

All tests require 24-hour flow-proportioned composite sampling. WETLIM10 determined the compliance endpoints for both 9 and 18 MGD facilities:

9 MGD – chronic NOEC greater than or equal to 15% equivalent to a TUc of less than or equal to 6.66;

18 MGD – chronic NOEC greater than or equal to 21% equivalent to a TUc of less than or equal to 4.76.

On DMRs, test NOECs are to be reported as TUc. LC50 at 48 hours and IC25 are to be reported.

Other Parameters:

PCBs – Two dry weather samples from Outfall 001 were collected for PCB Method 1668 analysis per 2009-2014 Permit Part I.C.10. PCB TMDL staff indicated a need for two wet weather samples from Outfall 001 to assist in development of the New River PCB TMDL. The permittee agreed to collect two wet weather samples and the data has been submitted as requested. A summary of the data can be found in APPENDIX C. Two criteria apply to this receiving stream segment: chronic aquatic life and human health. The appropriate wasteload allocations were calculated accounting for the background PCB concentration in the New River based on monitoring performed at river mile 75.53. A reasonable potential analysis was performed using the STATS.EXE program and it was determined that no limitations were needed to protect the aquatic life chronic criterion for either the 9 MGD or 18 MGD plants. A comparison of the data (expected value 727 pg/L) to the human health wasteload allocation (80,000 pg/L for the current design flow and 4,100 pg/L for the expansion) also showed no reasonable potential to violate the in-stream criterion. Therefore, no limitations are included. Print-outs from the STATS program and WLA spreadsheets can be found in APPENDIX D.

Temperature – WQS special standard "v" (9VAC25-260-310.v) establishes a maximum temperature of 29°C. Daily operation logs for January 1 – December 31, 2013 indicate a maximum temperature of 25°C. Application Form 2A Part A.12 indicates a maximum daily summer temperature of 26°C and an average daily summer temperature of 23°C. Temperature limits are not needed to protect water quality.

The following parameters (not monitored in the previous permit) were detected in application monitoring: ammonia, total Kjeldahl nitrogen (TKN), nitrate, oil & grease (O&G), phosphorus, total dissolved solids (TDS), total cadmium, total chromium, total copper, total nickel, total zinc, total phenolic compounds, hardness. Data for Sulfate and orthophosphate were also submitted. Ammonia is discussed in a separate section above.

Of those parameters identified above, the following have no applicable WQS criteria: TKN, oil & grease, phosphorus, hardness, orthophosphate. TKN application monitoring values (0.34, 0.85, & 1.11 mg/L) are low and raise no concerns. O&G application monitoring resulted in one detection (2.3 mg/L) and fourteen non-detects (<2.0 mg/L), resulting in no concerns. Phosphorus application monitoring values (2.00, 2.26, & 2.10 mg/L) are not a concern considering the large receiving stream flows. Hardness application monitoring values (243, 236, & 258 mg/L) are irrelevant. Orthophosphate monitoring values (1.42, 0.79, 1.81, & 1.73 mg/L) are part of the total phosphorus values.

The following detected parameters have applicable WQS human health public water supply (HH-PWS) criteria. These parameters are evaluated for reasonable potential by comparing monitoring data with HH-PWS wasteload allocations. 9.0 MGD wasteload allocations are the "non-antidegradation" wasteload allocations calculated by the MSTRANTI Version 2b spreadsheet. 18.0 MGD wasteload allocations are the antidegradation wasteload allocations calculated by the VRO spreadsheet.

Nitrate – The HH-PWS water quality criterion is 10,000 ug/L.

9.0 MGD HH-PWS wasteload allocation	730,000 ug/L
18.0 MGD HH-PWS wasteload allocation	46 mg/L = 46,000 ug/L
monitoring values	14,200, 16,500, & 17,000 ug/L

All monitoring values are below HH-PWS wasteload allocations.

Phenol – The HH-PWS water quality criterion is 10,000 ug/L.

9.0 MGD HH-PWS wasteload allocation	800,000 ug/L
18.0 MGD HH-PWS wasteload allocation	41,000 ug/L
application monitoring values	18, 13, 12, 11, 9, 7, & 5 ug/L (five <5 ug/L)

All monitoring values are significantly below HH-PWS wasteload allocations.

Sulfate – The HH-PWS water quality criterion is 250,000 ug/L.

9.0 MGD HH-PWS wasteload allocation	19,000,000 ug/L
18.0 MGD HH-PWS wasteload allocation	1,000 mg/L = 1,000,000 ug/L
monitoring values	76,800, 89,400, & 63,500 ug/L

All monitoring values are significantly below HH-PWS wasteload allocations.

Total Dissolved Solids (TDS) – The HH-PWS water quality criterion is 500,000 ug/L.

9.0 MGD HH-PWS wasteload allocation	40,000,000 ug/L
18.0 MGD HH-PWS wasteload allocation	2,400,000 ug/L
application monitoring values	605,000, 712,000, & 587,000 ug/L

All monitoring values are significantly below HH-PWS wasteload allocations.

The following metals were detected in application monitoring: cadmium, chromium, copper, nickel, and zinc. All metals lab analyses were total, not dissolved, thus all metals reasonable potential analyses are conservative. All metals are analyzed for reasonable potential for 9.0 MGD design flow and for 18.0 MGD design flow. 9.0 MGD analyses use "non-antidegradation" wasteload allocations calculated by the MSTRANTI Version 2b spreadsheet. 18.0 MGD analyses use antidegradation wasteload allocations calculated by the VRO spreadsheet. Reasonable potential analyses (STATS) printouts are in APPENDIX D.

Cadmium – There are applicable water quality criteria for aquatic protection (acute & chronic) and HH-PWS. Reasonable potential analyses using acute and chronic criteria indicate no limits are needed to protect water quality. The HH-PWS water quality criterion is 5 ug/L.

9.0 MGD PWS wasteload allocation	400 ug/L
18.0 MGD PWS wasteload allocation	20 ug/L
application monitoring values	0.2 ug/L (two <0.2 ug/L)

All monitoring values are significantly below HH-PWS wasteload allocations.

Chromium – Chromium analyses are complicated because application monitoring data are for total chromium and there are three forms of chromium identified in the Water Quality Standards: total Cr, Cr III, Cr VI. Total Cr has only HH-PWS criteria. Both Cr III and Cr VI have aquatic protection (acute & chronic) criteria. Cr VI acute and chronic criteria are more stringent than those for Cr III. A conservative approach for reasonable potential analyses (STATS) uses the more stringent Cr VI acute and chronic wasteload allocations with total Cr data. STATS indicates no limits are needed to protect water quality. The HH-PWS water quality criterion is 100 ug/L.

9.0 MGD HH-PWS wasteload allocation	8,000 ug/L
18.0 MGD HH-PWS wasteload allocation	410 ug/L
Total Cr application monitoring values	7.8, 26.7, & 8.0 ug/L

All monitoring values are significantly below HH-PWS wasteload allocations.

Copper – There are applicable water quality criteria for aquatic protection (acute & chronic) and HH-PWS. Reasonable potential analyses using acute and chronic criteria indicate no limits are needed to protect water quality. The HH-PWS water quality criterion is 1,300 ug/L.

9.0 MGD HH-PWS wasteload allocation	100,000 ug/L
18.0 MGD HH-PWS wasteload allocation	5,300 ug/L
application monitoring values	5.0, 5.3, & 5.3 ug/L

All monitoring values are significantly below HH-PWS wasteload allocations.

Nickel – There are applicable water quality criteria for aquatic protection (acute & chronic) and HH-PWS. Reasonable potential analyses using acute and chronic criteria indicate no limits are needed to protect water quality. The HH-PWS water quality criterion is 610 ug/L.

9.0 MGD HH-PWS wasteload allocation	49,000 ug/L
18.0 MGD HH-PWS wasteload allocation	2,500 ug/L
application monitoring values	4.5, 6.7, & 5.5 ug/L

All monitoring values are significantly below HH-PWS wasteload allocations.

Zinc – There are applicable water quality criteria for aquatic protection (acute & chronic) and HH-PWS. Reasonable potential analyses using acute and chronic criteria indicate no limits are needed to protect water quality. The HH-PWS water quality criterion is 7,400 ug/L.

9.0 MGD HH-PWS wasteload allocation	590,000 ug/L
18.0 MGD HH-PWS wasteload allocation	30,000 ug/L
application monitoring values	29.5, 34.9, & 40.6 ug/L

All monitoring values are significantly below HH-PWS wasteload allocations.

Water Quality Standards Monitoring and Limitations:

This permit does not include WQS monitoring. GM00-2011 states that the WQS monitoring should be repeated when there is a new significant industrial user discharging to a POTW. There are no new significant industrial dischargers since the previous application was submitted in 2009.

Reduced Monitoring:

From VPDES Permit Manual MN-2 A.5.a:

"Based on facility performance, only facilities having exemplary operations that consistently meet permit requirements should be considered for reduced monitoring. No facilities are specifically excluded from the evaluation. However, to ensure protection of aquatic life and human health, disinfection and dechlorination parameters are not eligible for reduced monitoring."

"Seasonal limits should not be eligible for reduced monitoring. Seasonally tiered limits already reflect relief from an annual limit."

"To qualify for consideration of reduced monitoring requirements, the facility should not have been issued any warning letters, notices of violations, or be under any consent orders, consent decrees, executive compliance agreements, or related enforcement documents during the past three years."

No effluent monitoring has been reduced in this permit issuance because the permittee received the following:
Warning Letter W2011-05-W-1008 (May 9, 2011) for significantly exceeding both TSS maximum weekly average limits in March, 2011;
Warning Letter W2011-12-W-1006 (December 7, 2011) for violating 0.6 mg/L minimum chlorine limit.

17. BASES FOR SLUDGE USE & DISPOSAL REQUIREMENTS:

The facility produces Class B biosolids for land application on fields in Pulaski County. Alternative disposal is at a sanitary landfill, the New River Solid Waste Management Area (permit #548). The Sludge Management Plan (SMP), submitted with the application, is approved with this permit reissuance.

BASES FOR LIMITATIONS AND MONITORING REQUIREMENTS IN PART III.A

Monitoring Type: biosolids monitoring
Monitoring Location: final biosolids product after all treatment, prior to land application

Part III.A.1.a. Sewage Sludge Annual Production Monitoring [Basis 1,2]
Bases for Residual Limitations
1. 9VAC25-31-220 B.2

Part III.A.1.b. Metals Limitations

PARAMETER	BASIS FOR LIMITS	LIMITATIONS		MONITORING REQUIREMENTS	
		Monthly Average	Maximum	Frequency	Sample Type
Arsenic (mg/kg)	1,2,3,4,5	41	75	per Part III.A.1.h	Composite
Cadmium (mg/kg)	1,2,3,4,5	39	85	per Part III.A.1.h	Composite
Copper (mg/kg)	1,2,3,4,5	1,500	4,300	per Part III.A.1.h	Composite
Lead (mg/kg)	1,2,3,4,5	300	840	per Part III.A.1.h	Composite
Mercury (mg/kg)	1,2,3,4,5	17	57	per Part III.A.1.h	Composite
Molybdenum (mg/kg)	1,2,3,4,5	NA	75	per Part III.A.1.h	Composite
Nickel (mg/kg)	1,2,3,4,5	420	420	per Part III.A.1.h	Composite
Selenium (mg/kg)	1,2,3,4,5	100	100	per Part III.A.1.h	Composite
Zinc (mg/kg)	1,2,3,4,5	2,800	7,500	per Part III.A.1.h	Composite

NL = no limitation, monitor and report

(1) All constituents are subject to cumulative pollutant loading rates (CPLR), pollutant concentrations (PC), and ceiling limits. PC biosolids contain the constituents identified above at concentrations below the monthly average specified in Part III.A.1.b. CPLR biosolids contain the constituents identified above at concentrations above the monthly average and each sample must be below the maximum concentration specified in Part III.A.1.b. If the concentration of any of these constituents in biosolids from any source exceeds the monthly average concentration, then the biosolids from the source are subject to CPLR rules (Part III.A.1.c and Part III.I.16.) [Bases 1 & 6]
(2) All limits and criteria are expressed on a dry weight basis. [Basis 1]
(3) The monthly average concentration for molybdenum is currently under study by USEPA. Research suggests that a monthly average molybdenum concentration below 40 mg/kg may be appropriate to reduce the risk of copper deficiency in grazing animals. [Basis 4]

Bases for Residuals Limitations
1. 9VAC25-31-540
2. 9VAC25-31-540, Table 1
3. 9VAC25-31-540, Table 2
4. 9VAC25-31-540, Table 4
5. 9VAC25-31-570, Table 1
6. 9VAC25-31-530 B & E

Monitoring Type: biosolids monitoring (only applicable to biosolids that are subject to Cumulative Pollutant Loading Rates (CPLRs))
Monitoring Location: calculated for each land application fields where biosolids subject to CPLRs are land applied

Part III.A.1.c. Site Specific Metals Loading Limitations

PARAMETER	BASIS FOR LIMITS	LIMITATIONS		MONITORING REQUIREMENTS	
		CPLR*		Frequency	Sample Type
		(kg/ha)	(lb/A)		
Arsenic	1	41	36	each application	Calculated
Cadmium	1	39	35	each application	Calculated
Copper	1	1,500	1,340	each application	Calculated
Lead	1	300	270	each application	Calculated
Mercury	1	17	16	each application	Calculated
Molybdenum	1	NL	NL	each application	Calculated
Nickel	1	420	375	each application	Calculated
Selenium	1	100	89	each application	Calculated
Zinc	1	2,800	2,500	each application	Calculated

NL = no limitation, monitor and report

(1) The CPLR is the maximum cumulative application of trace elements that can be applied to soils used for crop production. The maximum cumulative application rate is limited for all ranges of cation exchange capacity due to soil background pH in Virginia of less than 6.5 S.U. and lack of regulatory controls of soil pH adjustment after biosolids application ceases. [Bases 2 & 3]
(2) All limits and criteria are expressed on a dry weight basis. [Basis 4]
(3) No person shall apply bulk biosolids subject to the CPLRs identified above to agricultural land, forest, a public contact site, or a reclamation site if any of the CPLRs identified above has been reached. [Basis 5]
(4) The maximum cumulative application for molybdenum is currently under study by USEPA. Research suggests that for molybdenum a cumulative pollutant loading rate below 40 kg/hectare may be appropriate to reduce the risk of copper deficiency in grazing animals. [Basis 1]

Bases for Residuals Limitations
1. 9VAC25-31-540, Table 3
2. 9VAC25-31-530 B & E
3. 9VAC25-31-540 B
4. 9VAC25-31-540 A

Monitoring Type: biosolids monitoring
Monitoring Location: final biosolids product after all treatment, prior to land application

Part III.A.1.d. Pathogen Reduction Requirements

BASIS FOR LIMITS	PATHOGEN REDUCTION ALTERNATIVE	PROCESS TO SIGNIFICANTLY REDUCE PATHOGENS (PSRP) OPTION	CLASS B PATHOGEN REDUCTION TREATMENT STANDARDS	MONITORING REQUIREMENTS
1,2,3,4,5	2	3	PSRP: Anaerobic digestion for a mean cell residence time between 15 days at 35˚C - 55˚C up to 60 days at 20˚C. (9VAC25-32-675 D.3)	(2)

(1) Between sampling events, operating records must demonstrate that the wastewater treatment plant (WWTP) is operating at a performance level known to meet pathogen reduction standards. [Bases 1 & 5]
(2) Process monitoring must be sufficient to demonstrate compliance with PSRP treatment requirements. [Bases 1,2,3,5]

Bases for Residuals Limitations

1. 9VAC25-31-560 A
2. 9VAC25-31-710 B
3. 9VAC25-31-710 D
4. 9VAC25-31-570 A.1, Table 1
5. Environmental Regulations and Technology - Control of Pathogens and Vector Attraction Reduction in Sewage Sludge (EPA/625/R-92/013)

Monitoring Type: biosolids monitoring
Monitoring Location: final biosolids product after all treatment, prior to land application

Part III.A.1.e. Vector Attraction Reduction (VAR) Requirements

BASIS FOR LIMITS	VAR OPTION	VECTOR ATTRACTION REDUCTION TREATMENT STANDARD	MONITORING REQUIREMENTS
1,2,3,4	1	38% Reduction of volatile solids by digestion (9VAC25-32-685.B.1.)	per Part III.A.1.h (1)
1,2,3,4	2	When 38% reduction is not achieved by anaerobic digestion, 40 day bench study at temperatures between 30°C and 37°C to demonstrate further reduction of volatile solids <17%. (9VAC25-32-685.B.2.)	per Part III.A.1.h (1)

NA = not applicable
(1) Between sampling events, operating records must demonstrate that the wastewater treatment plant (WWTP) is operating at a performance level known to meet VAR standards. [Bases 2 & 3]
(2) Process monitoring must be sufficient to demonstrate compliance with VAR treatment requirements. [Bases 1,2,3,4]

Bases for Residuals Limitations
1. 9VAC25-31-570 A.1, Table 1
2. Environmental Regulations and Technology - Control of Pathogens and Vector Attraction Reduction in Sewage Sludge (EPA/625/R-92/013)
3. 9VAC25-31-560 C
4. 9VAC25-31-720

Monitoring Type: biosolids monitoring
Monitoring Location: final biosolids product after all treatment, prior to land application

Part III.A.1.f. Biosolids Characteristics

PARAMETERS	LIMITATIONS		MONITORING REQUIREMENTS	
	Monthly Average	Minimum and Maximum	Frequency	Sample Type
Percent Solids (%)	NL	NA	per Part III.A.1.h	Composite
Volatile Solids (%)	NL	NA	per Part III.A.1.h	Composite
Total Kjeldahl Nitrogen (mg/kg)(1)	NL	NA	per Part III.A.1.h	Composite
Ammonia Nitrogen (mg/kg) (1)	NL	NA	per Part III.A.1.h	Composite
Nitrate Nitrogen (mg/kg) (1)	NL	NA	per Part III.A.1.h	Composite
Total Phosphorus (mg/kg) (1)	NL	NA	per Part III.A.1.h	Composite
Total Potassium (mg/kg) (1)	NL	NA	per Part III.A.1.h	Composite
pH (S.U.)	NA	NL	per Part III.A.1.h	Composite
Alkalinity as $CaCO_3$ (mg/kg) if lime by weight is less than 10%	NL	NA	per Part III.A.1.h	Composite
CCE as $CaCO_3$ (%) if lime by weight is 10% or more	NL	NA	per Part III.A.1.h	Composite

NL = no limitation, monitor and report
NA = not applicable
(1) Expressed on a dry weight basis. [Basis 1]

Bases for Residuals Limitations
1. 9VAC25-31-550 A and 9VAC25-32-356 A

2. 9VAC25-31-570 A.1, Table 1

Monitoring Type: biosolids monitoring

Monitoring Location: nutrient loading rates shall be calculated for each source of biosolids land applied and each application of biosolids to an application

Part III.A.1.g. Nutrient Loading Rates

		LIMITATIONS				MONITORING REQUIREMENTS	
PARAMETERS	**Basis for limits**	**Conc. Lbs/Dry Ton**	**Field Application Rate**	**12 Month Field Loading**	**NMP Application Rate**	**Frequency**	**Sample Type**
Biosolids	1,2,3,4	N/A	(Dry Tons/Ac) (1)	(Dry Tons/Ac) (1)	(Dry Tons/Ac) (1)	Each application	Calculated
Plant Available Nitrogen (PAN)	1,2,3,4	NL	(Lbs/Ac) (1)	(Lbs/Ac) (1)	(Lbs/Ac) (1)	Each application	Calculated
Phosphate (P_2O_5)	1,2,3,4,5	NL	(Lbs/Ac) (1)	(Lbs/Ac) (1)	(Lbs/Ac) (1)	Each application	Calculated
K_2O	1,3,4,6	NL	(Lbs/Ac) (2)	(Lbs/Ac) (2)	(Lbs/Ac) (3)	(2,3)	Calculated
$CaCO_3$	1,3,4,7	NL	(Lbs/Ac) (4)	(Lbs/Ac) (4)	(Lbs/Ac) (5)	(4,5)	Calculated

NL = no limitation, monitor and report

(1) The field application rate and 12 Month Field Loading shall not exceed the application rate specified in the nutrient management plan (NMP) for the application method used. [Basis 1,2]

(2) Report the amount of K_2O provided by the biosolids/residuals and supplemental K_2O applied for each application where the soil test K is < 38 ppm Mehlich I. [Basis 5]

(3) Report the K_2O application rate recommended in the NMP for each application where the soil test K is < 38 ppm Mehlich I. [Basis 5]

(4) Report the amount of $CaCO_3$ provided by the biosolids/residuals and supplemental $CaCO_3$ applied for each application where the soil test pH is < 5.5 S.U. Mehlich I. [Basis 6]

(5) Report the $CaCO_3$ application rate recommended in the NMP for each application where the soil test pH is < 5.5 S.U. [Basis 6]

Bases for Residuals Limitations

1. 9VAC25-31-550 A and 9VAC25-32-560 B.3.a
2. 9VAC25-31-485 G
3. 9VAC25-32-360 C
4. 9VAC25-31-220 B.2 & I
5. 9VAC25-31-505 A.4
6. 9VAC25-32-560 B.2.e
7. 9VAC25-32-560 B.2.d

Monitoring Type: frequency of monitoring - biosolids

Monitoring Location:

Part III.A.2.1.h. Frequency of Monitoring

The frequency of monitoring for each biosolids source is based on the amount of bulk biosolids from that source applied to the land, as indicated in the table below: [Basis 1]

AMOUNT OF BIOSOLIDS LAND APPLIED PER 365-DAY PERIOD		
dry tons	metric dry tons	Frequency
Greater than zero but less than 320	Greater than zero but less than 290	Once per year
Equal to or greater than 320 but less than	Equal to or greater than 290 but less than 1500	Four times per year (Once per quarter)
Equal to or greater than 1,653 but less than	Equal to or greater than 1,500 but less than 15,000	Six times per year (Once per 60 days)
Equal to or greater than 16,535	Equal to or greater than 15,000	12 times per year (Once per month)

(1) Either the amount of bulk biosolids applied to the land or the amount of sewage sludge received by a person who prepares biosolids that is sold or given away in a bag or other container for application to the land (dry weight basis).

(2) Minimum monitoring frequency is 1/yr; 4/yr; 6/yr; 12/yr, as identified in table. Monitoring shall be conducted at routine intervals, i.e. quarterly, bi-monthly, monthly by facilities that generate biosolids routinely throughout the year.

Bases for Residuals Limitations
1. 9VAC25-31-570 A, Table 1

Monitoring Type: **s**oils monitoring
Monitoring Location: all land application sites before sludge is reapplied

Part III.A.2. Soil

PARAMETER	BASIS FOR LIMITS	LIMITATIONS	MONITORING REQUIREMENTS	
			Frequency	Sample Type
Soil pH (SU)	1,2	NL	prior to biosolids application***	Composite
Available Phosphorus (Mehlich I - P)* (ppm)	1,2	NL	prior to biosolids application	Composite
Extractable Potassium (Mehlich I – K)**(ppm)	1,2	NL	prior to biosolids application	Composite
Extractable Calcium (mg/100 g)	1,2	NL	prior to biosolids application	Composite
Extractable Magnesium (mg/100 g)	1,2	NL	prior to biosolids application	Composite
Zinc (mg/kg)	1,2	NL	prior to biosolids application	Composite
Manganese (mg/kg)	1,2	NL	prior to biosolids application	Composite

NL = no limitation, monitoring required

* Available Phosphorus shall be analyzed using Mehlich I or Mehlich III analytical procedure. If sample is analyzed using Mehlich III, results shall be converted to Mehlich I for reporting purposes. [Basis 1]
** Extractable Potassium shall be analyzed using Mehlich I analytical procedure or equivalent. If sample is analyzed using an equivalent procedure, results shall be converted to Mehlich I for reporting purposes. [Basis 2]
*** For biosolids with a cadmium concentration greater than or equal to 21 mg/kg the soil pH sample must be less than 1 year old. [Basis 3]

(1) Soil samples shall be collected and analyzed in accordance with regulations promulgated under § 10.1-104.2 of the Code of Virginia and as outlined in the Biosolids Management Plan (BSMP). [Basis 1]
(2) All parameters except for pH shall be monitored on a dry weight basis. [Basis 1]
(3) Results of the soil monitoring specified above shall be used to develop the NMP in accordance with Part III.D.2. [Basis 4]
(4) No sample analysis used to determine application rates shall be more than 3 years old at the time of the biosolids land application. [Basis 1 and 4]

Bases for Effluent Limitations
1. 9VAC25-31-543 A-C, Table 1
2. 9VAC25-31-550 A and 9VAC25-32-560 B.2.e
3. 9VAC25-31-550 A and 9VAC25-32-560 B.2.c
4. 4VAC5-15 Nutrient Management Training and Certification Regulations

18. **ANTIBACKSLIDING STATEMENT:** No permit limits for the existing discharge will be made less stringent with this permit reissuance. Therefore, the permit complies with the antibacksliding requirements.

19. **COMPLIANCE SCHEDULES:** N/A

20. **SPECIAL CONDITIONS**

Part I.B.1. 95% Capacity Reopener
Rationale: Required by VPDES Permit Regulation, 9VAC25-31-200 B.4 for all POTW and PVOTW permits.

Part I.B.2. Indirect Dischargers
Rationale: Required by VPDES Permit Regulation, 9VAC25-31-200 B.1 and B.2 for POTWs and PVOTWs that receive waste from someone other than the owner of the treatment works.

Part I.B.3. CTC, CTO Requirement
Rationale: Required by Code of Virginia § 62.1-44.19; Sewage Collection and Treatment Regulations, 9VAC25-790.

Part I.B.4. O&M Manual Requirement
Rationale: Required by Code of Virginia § 62.1-44.19; Sewage Collection and Treatment Regulations, 9VAC25-790; VPDES Permit Regulation, 9VAC25-31-190 E.

Part I.B.5. Licensed Operator Requirement
Rationale: The VPDES Permit Regulation, 9VAC25-31-200 C and the Code of Virginia § 54.1-2300 *et seq*, Board for Waterworks and Wastewater Works Operators and Onsite Sewage System Professional Regulations (18VAC160-20-10 *et seq*), require licensure of operators.

Part I.B.6. Reliability Class
Rationale: Required by Sewage Collection and Treatment Regulations, 9VAC25-790 for all municipal facilities.

Part I.B.7. Sludge Use and Disposal
Rationale: VPDES Permit Regulation, 9VAC25-31-100 P; 220 B.2; and 420 through 720, and 40 CFR Part 503 require all treatment works treating domestic sewage to submit information on sludge use and disposal practices and to meet specified standards for sludge use and disposal.

Part I.B.8. Sludge Reopener
Rationale: Required by VPDES Permit Regulation, 9VAC25-31-220 C for all permits issued to treatment works treating domestic sewage.

Part I.B.9. Total Maximum Daily Load Reopener
Rationale: Section 303(d) of the Clean Water Act requires that total maximum daily loads (TMDLs) be developed for streams listed as impaired. This special condition is to allow the permit to be reopened if necessary to bring it into compliance with any applicable TMDL approved for the receiving stream. The re-opener recognizes that, according to Section 402(o)(1) of the Clean Water Act, limits and/or conditions may be either more or less stringent than those contained in this permit. Specifically, they can be relaxed if they are the result of a TMDL, basin plan, or other wasteload allocation prepared under Section 303 of the Act.

Part I.B.10. Compliance Reporting
Rationale: Authorized by VPDES Permit Regulation, 9VAC25-31-190 J.4 and 220 I. This condition is necessary when pollutants are monitored by the permittee and a maximum level of quantification and/or a specific analytical method is required in order to assess compliance with a permit limit or to compare effluent quality with a numeric criterion. The condition also establishes protocols for calculation of reported values.

Part I.C. Pretreatment
Rationale: VPDES Permit Regulation, 9VAC25-31-730 through 900, and 40 CFR Part 403 require certain existing and new sources of pollution to meet specified regulations.

Part I.D. Whole Effluent Toxicity Program
Rationale: VPDES Permit Regulation, 9VAC25-31-210 and 220 I, requires monitoring in the permit to provide for and assure compliance with all applicable requirements of the State Water Control Law and the Clean Water Act.

Part II. Conditions Applicable to all VPDES Permits
Rationale: VPDES Permit Regulation, 9VAC25-31-190 requires all VPDES permits to contain or specifically cite the conditions listed.

Part III. Biosolids
Tabulated below are the special condition sections of the permit, with the bases for each of the permit special conditions.

Special Condition	Description and Basis for Special Condition
Part III.B.1	**Monthly Reporting:** 9VAC25-31-590 B and the Fee Regulation 9VAC25-20-147 B require submittal of a report by the 15th of the month following the month in which land application occurred.
Part III.B.1.a-b	**Biosolids Monitoring Data:** 9VAC25-31-220 I.3 requires reporting of monitoring to assure compliance with the permit limits shall be no less frequent than as required by the regulation. 9VAC25-31-190 L.4 Monitoring results shall be reported at the intervals specified in the permit on a Discharge Monitoring Report (DMR) or forms provided or specified by the department for reporting results of monitoring of sludge use or disposal practices.
Part III.B.1.c	**Monthly Activity Report:** 9VAC25-31-590 B and Fee Regulation 9VAC25-20-147 B requires submittal of a report by the 15th of the month following the month in which land application occurred. Specific information to be provided is identified in 9VAC25-20-147 A and B.
Part III.B.1.d	**Electronic Submittal Attestation Statement:** § 59.1-479 – 498, the Uniform Electronic Transactions Act provides for submission of paperwork electronically and the use of electronic signatures.
Part III.B.2	**Land Application Fee:** § 62.1-44.19.3.P requires that a fee be charged to the generator of biosolids to be land applied in Virginia. The fee of $7.50/dry ton of biosolids applied in the Commonwealth of Virginia is established by the Fee Regulation 9VAC25-20-146 and 9VAC25-20-40 A.3. Exemptions to the fee are provided in 9VAC25-20-50 C. 9VAC 20-60 D establishes the due date.
Part III.B.3	**Annual Report:** 9VAC25-31-590 A requires the submittal of an annual report postmarked by February 19 for the previous year. 9VAC25-31-220 I.3 provides for the VPDES permit to require monitoring the volume of biosolids and other measurements as appropriate. 9VAC25-31-590 C requires reports be maintained verifying that sludge treatment for pathogen and vector attraction reduction be maintained by the generator and owner (of the permit). 9VAC25-31-190 H requires the permittee to submit information requested by the board, within a reasonable time, to determine compliance with the permit. Other specific information and maintenance requirements are identified in 9VAC25-20-147 A.
Part III.C.1	**Records Retention:** VPDES Permit Regulation 9VAC25-31-580 requires permittees who prepare sewage sludge to develop records as well as retain those records for a minimum of five (5) years.

Part III.C.2	**Class B/PC Biosolids Record Keeping:** VPDES Permit regulation 9VAC25-31-580 outlines record keeping requirements for Class B/PC biosolids.
Part III.C.3	**Class B/CPLR Biosolids Record Keeping:** VPDES Permit regulation 9VAC25-31-580 A.5 outlines record keeping requirements for Class B/CPLR biosolids.
Part III.D.1	**Biosolids Management Plan (BSMP):** VPDES Permit Regulation 9VAC25-31-485 G requires the permit holder to maintain and implement a BSMP and specifies its components. In addition to all materials submitted with permit application, which includes an Odor Control Plan (OCP), a Nutrient Management Plan (NMP) and Operation and Maintenance (O&M) Manual are required.
Part III.D.2	**Nutrient Management Plan (NMP) Requirement:** § 62.1-44.19.3.C.8 requires that a NMP be developed by a person certified in accordance with § 10.1-104.2 for each biosolids land application site, prior to application of biosolids at the site. The statute also establishes conditions where the NMP must be approved by the Department of Conservation and Recreation prior to submittal at the time of permit application. 9VAC25-31-505 A.1.e states that if conditions at the site change so that it meets one or more special conditions, the NMP will be approved prior to application at the site. 9VAC25-31-505 A.3, with which all biosolids operations must comply, requires that the NMP be submitted to the farmer/operator of the site, the Department of Conservation and Recreation, and the local government, unless requested in writing to not receive the NMP. 9VAC25-31-505 A.4, Table 1 requires the NMP to be approved by DCR prior to application based on soil phosphorus levels (Mehlich I).
Part III.D.3	**Operation and Maintenance (O&M) Manual Requirement:** 9VAC25-31-485 G.3, 9VAC25-790-140 and 9VAC25-790-260 – 300 identify minimum requirements to be included in an O&M Manual. Additional requirements are included in the BSMP 9VAC25-31-100 Q.12.
Part III.D.4	**Odor Control Plan (OCP) Requirement:** 9VAC25-31-100 Q.6 requires Generator's OCP and minimum content.
Part III.D.5	**Permittee Source List - Biosolids:** 9VAC25-31-440 D states *no person shall land apply, market, or distribute biosolids in Virginia unless the biosolids source has been approved by the board.* 9VAC25-31-100 Q.8.b requires identification of sources that the permittee proposes to land apply in the permit application, which becomes part of the BSMP. Water Control Law and the VPDES Permit Regulation do not require a permit modification to add a new source; therefore a source that is approved may be added to the Permittee Source List with administrative authorization. A source not previously or currently approved, must obtain approval before it can be land applied under a VPDES permit.
Part III.E.1	**100 Day Notification:** 9VAC25-31-485 D.1 requires written notification to the chief executive officer (CEO) or designee for the locality 100 days prior to the initial land application at a specific site and clarifies that the notice may be satisfied by DEQ's notice of the permit application, if necessary site information was provided in that notification.
Part III.E.2	**14 Day Notification:** § 62.1-44.19.3.L and 9VAC25-31-485 D.2 requires written notification to the department and the CEO or designee for the locality at least 14 days prior to land application at a specific site.
Part III.E.3	**Signage Requirements:** 9VAC25-31-485 F.1 requires a sign be posted at a land application site at least 5 business days prior to delivery of biosolids at the site and maintained on site until 5 business days after application is complete; the sign will not be removed until 30 days after land application is complete. 9VAC25-31-485 F.1.a. – b addresses placement of the signs. 9VAC25-31-485 F.3– 4 specifies construction, content, and maintenance of the sign.

Part III.E.4	**Notification of Sign Posting:** 9VAC25-31-485 F.2 requires written notification to DEQ and the CEO or designee for the locality within 24 hours of posting, identifying where the signs have been posted, and identifies information required in the notice.
Part III.E.5	**24 Hour Notification:** 9VAC25-31-485 D.3 requires written notice to DEQ and the CEO or designee for the locality no more than 24 hours prior to commencing activity at a site, including delivery. Include the source of material and only sites where land application activities or staging will commence within 24 hours.
Part III.E.6	**Site Operator Notification and Information:** VPDES Permit Regulation 9VAC25-31-530 H states *The person who applies bulk biosolids to the land shall provide the owner or lease holder of the land on which the bulk biosolids is applied notice and necessary information to comply with the requirements in this article.*
Part III.E.7	**Handling of Complaints:** VPDES Permit Regulation 9VAC25-31-485 H requires the permittee to respond within 24 hours of receiving a complaint related to the land application of biosolids, and provide notification of the complaint to DEQ, the local government where the complaint is based and the generator(s) of the biosolids involved.
Part III.E.8	**Generator NANI:** 9VAC25-31-530 F requires the generator of biosolids who provides biosolids to a land applier, to give notice and necessary information to the land applier. 9VAC25-31-480 states that the preparer of biosolids shall ensure that the applicable requirements in 9VAC25-31 Part VI are met when biosolids are land applied.
Most of the following **Special Conditions** have their basis in the VPA regulation. 9VAC25-31-505 C of the VPDES Permit Regulation states *Bulk biosolids meeting Class B pathogen reduction standards shall be land applied in accordance with the Virginia Pollution Abatement Permit Regulation, Article 3, Biosolids Use Standards and Practices, set forth in 9VAC25-32-490 through 9VAC25-32-580.*	
Part III.F.1 – 5	**TRANSPORT requirements:** 9VAC25-32-540 A – E identifies requirements for transport routes, vehicles, prevention of drag-out and track-out, clean-up of such drag-out and track-out and clean-up and reporting of spills.
Part III.G.1 – 11	**STAGING:** 9VAC25-32-545 A – B defines staging and provides procedural requirements for staging up to 7 days and daily inspections by certified land applier; procedural and notification requirements to be implemented if biosolids cannot be applied by the end of the 7th day; and prohibits overnight staging in areas of Karst, areas identified by U.S. Department of Agriculture - Natural Resources Conservation Service (USDA-NRCS) as frequently flooded, and sites with on-site storage.
Part III.H.1 – 2	**ON-SITE STORAGE Requirements:** 9VAC25-32-550 D.1, 3 – 10 describes on-site storage and provides procedural requirements for staging up to 45 days, routine inspections by certified land applier; procedural and notification requirements; 9VAC25-32-550 D specifies on-site storage shall take place on a constructed surface at a location preapproved by DEQ and that biosolids stored on the site shall be land applied only at sites under control of the owner/operator of the site where the on-site storage is located; 9VAC25-32-550 C and D.2, 6 specifies permeability requirements for the pad and requires existing storage facilities to come into compliance with the amended regulation by 9/1/2014.
Part III.I.1	**Infrequent Application:** 9VAC25-32-560 B.3.c establishes infrequent application based on total crop needs for nitrogen.
Part III.I.2	**Depth to Bedrock or Restrictive Layers:** 9VAC25-32-560 B.2.a states depth to bedrock or restrictive layers shall be a minimum of 18 inches.

Part III.I.3	**Depth to Ground Water:** 9VAC25-32-560 B.2.b prohibits land application when seasonal high water table is within 18" of ground surface and requires use of USDA-NRCS soil survey maps and soil borings to verify groundwater depth.
Part III.I.4	**pH Management:** 9VAC25-32-560 B.2.c requires the biosolids soil mixture have a pH of 6>0 S.U. or higher where cadmium in the biosolids is >= 21 mg/kg. 9VAC25-32-560 B.2.c and d requires the addition of lime or use of lime amended biosolids if soil pH is < 5.5 S.U.
Part III.I.5	**Soil Potassium < 38 ppm:** 9VAC25-32-560 B.2.e requires addition of potash prior to or concurrently with the biosolids if the soil potassium (Mehlich I) is < 38 ppm.
Part III.I.6	**Equipment Calibration:** 9VAC25-32-560 B.3.d(1) requires routine measurement of the field application rate of application equipment.
Part III.I.7	**Liquid Biosolids:** 9VAC25-32-560 B.3.d(1) limits application of liquid biosolids to 14,000 gallons per acre, per application with drying time between applications.
Part III.I.8	**Grass Height:** 9VAC25-32-560 B.3.d(1) requires hay and pasture to be grazed or clipped to approximately 6 inches prior to biosolids application.
Part III.I.9	**Uniform Application:** 9VAC25-32-560 B.3.d(1) requires a uniform application of biosolids on a field. If application is not uniform additional operational methods are required followed by clipping.
Part III.I.10	**Odor Control by Incorporation:** 9VAC25-32-560 B.3.d(2) allows DEQ or the local monitor to require incorporation, when practical or compatible with a soil conservation plan, to mitigate malodor.
Part III.I.11	**Slope Restrictions:** 9VAC25-32-560 B.3.d(3) prohibits application on slopes >15%, but allows the restriction to be waived by DEQ for the establishment and maintenance of perennial vegetation or based on BMPs.
Part III.I.12	**Snow Covered Ground:** 9VAC25-32-560 B.3.d(5) allows land application of biosolids on snow cover that is 1 inch or less in depth and the snow and biosolids are incorporated within 24 hours. If the snow melts with application, incorporation is not required.
Part III.I.13	**Setbacks:** 9VAC25-32-560 B.3.e(1) – (4) establishes setback distances and procedures for extending or waiving residential and property line setbacks.
Part III.I.14	**Site Access Restrictions:** 9VAC25-32-675 B.5 establishes access restrictions for sites where Class B biosolids have been land applied.
Part III.I.15	**Forestland (Silviculture):** 9VAC25-32-560 C establishes requirements for land application on silvicultural sites.
Part III.I.16	**CPLR Biosolids:** VPDES Permit Regulation 9VAC25-31-530 establishes criteria for determining the need to track the metals loadings on individual sites where metals subject to the cumulative pollutant loading rates have been applied.
Part III.J.1	**Biosolids Sources**: 9VAC25-31-440 D states that no person shall land apply, market or distribute biosolids in Virginia unless the biosolids source has been approved by the board.

Part III.J.2	**Land Application Sites**: 9VAC25-31-440 C states that no person shall land apply Class B biosolids on any land in Virginia unless that land has been identified in an application to issue, reissue or modify a permit and approved by the board.
Part III.J.3	**Pollution Liability and General Liability Requirement:** 9VAC25-31-485 E requires the permit holder to provide evidence of financial responsibility in accordance with 9VAC25-32-770 *et seq***.** 9VAC25-32-780 establishes liability requirements. 9VAC25-32-790 – 850 provides specific requirements for each type of liability demonstration.
Part III.J.4	**Alteration of Biosolids Composition:** 9VAC25-31-505 B.2 prohibits the alteration of the biosolids composition at the land application site.
Part III.J.5	**Site Specific Application Rates**: 9VAC25-32-560 states site specific application rates shall not exceed the rates established in the nutrient management plan nor result in exceedance of the cumulative trace element loading rates specified in 9VAC25-32-356 Table 3.
Part III.J.6	**Landowner Consent Requirement**: 9VAC25-31-100 F.6 requires the submission of landowner consent forms with the permit application. 9VAC25-31-485 B.2 requires the written agreement between the permittee and the landowner, specifies required information and use of the most current form approved by the board. 9VAC25-31-485 C requires the permittee to maintain the agreement. 9VAC25-31-485 B.4 requires the permittee to notify landowners with landowner agreements on old forms to notify the landowner of the need to sign and submit new landowner agreements on the current form.
Part III.J.7	**Threatened and Endangered Species Protection:** 9VAC25-31-550 B states no one shall apply bulk biosolids to the land if it is likely to adversely affect a threatened or endangered species listed in 9VAC25-260-320 or § 4 of the Endangered Species Act (16 USC § 1533) or if the land application is likely to adversely affect its designated critical habitat.
Part III.J.8	**Certified Land Applicator Requirement**: § 62.1-44.19.3.1.B. states that Class B biosolids shall not be land applied unless a certified land applicator is onsite at all times during the application. 9VAC25-31-485 A prohibits land application of Class B biosolids unless a person certified as a Land Applicator in accordance with VPA Permit Regulation 9VAC25-32-690 - 760 is on site at all times during the land application. 9VAC25-32-690 requires the land applier to maintain a field log and identifies minimum requirements and sign monthly reports, attesting that they were onsite at all times reported.
Part III.J.9	**Reopener:** 9VAC25-31-220 C requires inclusion of a reopener clause in the permit to authorize immediate modification of the permit to address changes to standards or requirements for the use or disposal of biosolids, industrial wastewater sludge, or septage.
Part III.J.10	**Storm Water Discharge Exception:** 9VAC25-32-30 A states that all pollutant management activities covered under a VPA permit shall maintain no point source discharge of pollutants to surface waters except in the case of a storm event greater than the 25-year, 24-hour storm. 9VAC25-32-30 B states that except in compliance with the VPA or another permit issued by the board that it is unlawful to discharge into, or adjacent to, state waters sewage, industrial wastes, other wastes, or any noxious or deleterious substances.

21. **CHANGES TO PERMIT:** Changes to effluent limits or monitoring frequency in this permit are in this table.

PERMIT PROCESSING CHANGE SHEET for Effluent Limits and Monitoring Schedule						
Outfall	Parameter Changed	Monitoring Requirement Changed		Effluent Limit Changed		Reason for Change
		From	To	From	To	
001 (9 MGD)	TRC	1/day	NA*	0.026 mg/L maximum weekly average 0.022 mg/L monthly average	NA*	UV disinfection replaced Cl disinfection
001 (18 MGD)	TRC	1/day	NA*	0.018 mg/L maximum weekly average 0.015 mg/L monthly average	NA*	UV disinfection replaced Cl disinfection
001 (9 & 18 MGD)	*E. coli*	2/month (at least 7 days apart)	1/day*	NA	NA	UV disinfection replaced Cl disinfection

*effective since switch from Cl disinfection to UV disinfection

Special Conditions Changed in this Permit
Some special conditions are not modified except for their number. Only the special conditions listed below are removed, added, or modified in content:

Special Conditions removed:
- Previous Part I.B, Additional TRC Limitations and Monitoring Requirements, is removed because UV disinfection replaced chlorine disinfection.
- Part I.B.11, PCB Monitoring for TMDL Development has been removed; the permittee completed dry weather monitoring required by the permit and wet weather monitoring as requested by DEQ.

Special Conditions modified:
- Part I.B.3, CTC, CTO Requirement, is modified per previous Permit Manual MN-3 A.5 (January 27, 2010). The condition in current Permit Manual MN-3 A.4 (March 27, 2014) contains an incorrect statement and requires the permit writer to make a choice that the writer cannot predict.
- Part I.B.4, O&M Manual Requirement, is significantly modified per Permit Manual MN-3 A.5.
- Part I.B.5, Licensed Operator Requirement, is slightly modified per Permit Manual MN-3 A.6.
- Part I.B.10, Compliance Reporting, is significantly modified per Permit Manual MN-3 A.14.
- Part I.C, Pretreatment, is significantly modified per Permit Manual MN-3 A.18.
- Part I.D, Whole Effluent Toxicity Program, is significantly modified to clarify monitoring and reporting and to establish testing for an 18 MGD facility.
- Part II, Conditions Applicable to all VPDES Permits is slightly modified per Permit Manual MN-1 B.3.
- Part III - Previous Biosolids Parts I.A.3-5 and Parts I.F-I are replaced by Part III per recent biosolids guidance.

Special Conditions added: none

22. **VARIANCES/ALTERNATE LIMITS OR CONDITIONS:** None

23. **REGULATION OF USERS:** 9VAC25-31-280 B.9 requires that every permit issued to a treatment works not owned by a state or municipality provide an explanation of the Board's decision on the regulation of users. PFRWTA is a municipality and therefore is not subject to this regulation.

24. **PUBLIC NOTICE INFORMATION REQUIRED BY 9VAC25-31-280 B:**

All pertinent information is on file and may be inspected and copied by contacting Bob Tate at:

Virginia Department of Environmental Quality
Blue Ridge Regional Office
3019 Peters Creek Road
Roanoke, VA 24019
(540) 562-6774
e-mail: bob.tate@deq.virginia.gov

Persons may comment in writing or by email to the DEQ on the proposed permit action, and may request a public hearing, during the comment period. Comments shall include the name, address, and telephone number of the writer and of all persons represented by the commenter/requester, and shall contain a complete, concise statement of the factual basis for comments. Only those comments received within this period will be considered. The DEQ may decide to hold a public hearing, including another comment period, if public response is significant and there are substantial, disputed issues relevant to the permit. Requests for public hearings shall state (1) the reason why a hearing is requested; (2) a brief, informal statement regarding the nature and extent of the interest of the requester or of those represented by the requester, including how and to what extent such interest would be directly and adversely affected by the permit; and (3) specific references, where possible, to terms and conditions of the permit with suggested revisions. Following the comment period, the Board will make a determination regarding the proposed permit action. This determination will become effective, unless the DEQ grants a public hearing. Due notice of any public hearing will be given. The public may review the draft permit and application at DEQ's Blue Ridge Regional Office by appointment.

25. **ADDITIONAL COMMENTS:**

Previous Board Action: A Consent Order was issued to the PFRWTA October 23, 2003 and amended on September 8, 2004. The order, as amended, was terminated on May 16, 2005. There have been no formal enforcement actions since the consent order was terminated in 2005.

Staff Comments: Previously, use of the Primary Flow Diversion Line was subject to the requirements in Permit Part II.U and the O&M Manual. However, the diversion line is not usable due to facility changes.

The PFRWTA has elected to maintain VPDES Industrial Storm Water General Permit (ISWGP) registration in lieu of submitting Form 2F and including the storm water conditions in this permit. PFRWTA is registered under permit number VAR051282. The effective date of the ISWGP is July 1, 2014, and the expiration date is June 30, 2019. The facility will have to reapply for the General Permit upon expiration to prevent a lapse in coverage for their industrial storm water outfalls. PFRWTA may alternatively submit Form 2F to request a modification to include the storm water provisions in this permit. Form 2F may be submitted with their next application for reissuance of VA0062685 and the storm water provisions can be included at that time.

Public Notice Comments: The only comments received during the 30-day public comment period were from the permittee. The permittee objected to several draft permit items in a letter dated July 8, 2014. After a meeting with DEQ personnel, the permittee forwarded a follow-up e-mail message on July 9, 2014. DEQ responded in a letter dated July 17, 2014. The permittee requested a public hearing in a letter dated July 18, 2014. DEQ responded to the request by letter dated August 14, 2014, and by letter dated August 19, 2014, the permittee withdrew the request for a public hearing. Related correspondence is included in Appendix H.

Other Agency Comments:

United States Environmental Protection Agency (EPA) — In a message dated June 12, 2014: "As a result of this limited review of the draft permit, we (EPA) have no comments related to the impaired waters." Appendix G contains EPA's draft permit review message.

Public Water Supplies — A copy of the application was forwarded to the Virginia Department of Health's Office of Drinking Water (VDH) on January 22, 2014. VDH responded with a VPDES Review Memorandum dated January 29, 2014. The memo contained the following comments:

> "There are no public water supply intakes located within 15 miles downstream of the discharge. We recommend a minimum Reliability Class III for this facility. We have no comments on the discharge."

APPENDIX G contains VDH's memo.

Threatened and Endangered (T&E) Species — A VPDES Permits Threatened and Endangered (T&E) Species Coordination form was forwarded to the Virginia Department of Conservation and Recreation (VDCR), the Virginia Department of Game and Inland Fisheries (VDGIF), and the United States Fish and Wildlife Service (USFWS) on January 23, 2014, per Memo of Understanding and GM 07-2007. APPENDIX G contains the coordination form.

USFWS commented in a message dated and received January 27, 2014. USFWS's message contained the following response:

> "Thanks for providing us with the opportunity to comment. The Roanoke logperch (*Percina rex*) is not known to occur in the New River, so, from a federally listed species perspective, I see no need to comment on this permit reissuance. However, I will applaud the use of UV treatment at this facility!"

APPENDIX G contains USFWS's message.

VDCR commented in a letter dated February 18, 2014. The letter identifies two species historically documented in the vicinity, the Hellbender and the Green floater. The Hellbender (*Cryptobranchus alleganiensis*) is a large, completely aquatic salamander. VDCR's letter did not indicate a legal status for the Hellbender. The Green floater (*Lasmigona subviridis*) is a rare freshwater mussel and is listed as a state threatened species. VDCR's letter contained three recommendations. One recommendation was to use UV or ozone disinfection to replace chlorination. DCR also recommended "adhering to the proposed EPA standards for ammonia limits for freshwater mussels." "Due to the legal status of the green floater …" VDCR recommended "… coordination with … VDGIF, to ensure compliance with the Virginia Endangered Species Act …." DEQ responded with a letter dated February 20. DEQ's response indicated that (1) the facility replaced chlorine disinfection with UV disinfection in July, 2012, (2) the only legally applicable ammonia criteria for evaluating potential ammonia toxicity are in Virginia's Water Quality Standards, and (3) USFWS, VDGIF, and VDCR were forwarded by e-mail the T&E species coordination form with screening information. However, the permit writer did not did not identify the Green floater on the T&E form because he did not find the species identified in a VDGIF database search. APPENDIX G contains VDCR's letter and DEQ's reply.

VDGIF did not respond.

26. **303(d) LISTED SEGMENTS (TMDL):** This facility discharges directly to the New River. The stream segment receiving the effluent is listed as impaired for PCB on the current 303(d) list. (See APPENDIX A for 2012 Impaired Waters fact sheet N29R-01-PCB.) The impaired use is fish consumption and the cause is PCB in fish tissue. The associated TMDL is expected to be developed late in 2014 and possibly complete in 2015. Effluent PCB monitoring has been performed to assist in TMDL development. This permit contains a TMDL reopener condition should an approved PCB TMDL contain a wasteload allocation for the facility.

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- United States Fish and Wildlife Service (USFWS)
- Virginia Department of Conservation and Recreation (VDCR)

APPENDIX H Public Comment Correspondence

APPENDIX A

RECEIVING STREAM INFORMATION

Flow Frequencies Determinations
January 31, 2014

2012 Impaired Waters Fact Sheet

Stream Data & Statistics from STORET Station 9-NEW081.72 at the Route 11 Bridge in Radford
Hardness
Temperature
pH
WQS parameters background concentrations

MEMORANDUM

VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY
WATER DIVISION
Blue Ridge Regional Office

Subject: Flow Frequencies Determinations for Reissuance of VPDES Permit VA0062685; Pepper's Ferry Regional Wastewater Treatment Authority

To: Permit File

From: Bob Tate, Water Permit Writer RST

Date: January 31, 2014

Attachments: flow calculations spreadsheet; New River withdrawals and discharges data sheet

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This memo is a revision of the previous flow frequencies determination memo dated May 28, 2009.

The Pepper's Ferry Regional Wastewater Treatment Authority discharges treated wastewater to the New River near Radford, VA. Stream flow frequencies are required at this site for use in developing effluent limitations for the VPDES permit.

The USGS has operated a continuous record gauge on the New River at Radford, VA (#0317100) since 1940. The gauge is located at the Route 11 bridge, approximately 6 miles upstream of the discharge point. The flow frequencies for the gauge and the discharge point are presented below. The values at the discharge point were calculated using drainage area proportions and account for known withdrawals and discharges located between the gauge and the discharge point, Outfall 001. (Withdrawals and discharges are explained in the next page.) This analysis does not address any other withdrawals, discharges, or springs between the gauge and the discharge point which may influence flow in the New River.

New River at Radford, VA (#03171000)
Drainage Area = 2748 mi^2

1Q30 = 678 cfs	
1Q10 = 719 cfs	High Flow* 1Q10 = 840 cfs
7Q10 = 887 cfs	High Flow* 7Q10 = 1210 cfs
30Q10 = 1020 cfs	High Flow* 30Q10 = 1660 cfs
30Q5 = 1140 cfs	Harmonic Mean* = 2350 cfs

Using drainage area proportions, the river flows were projected to just above the outfall.

New River above discharge point
Drainage Area = 2791 mi^2

1Q30 = 689 cfs = 445 MGD	
1Q10 = 730 cfs = 472 MGD	High Flow* 1Q10 = 853 cfs = 551 MGD
7Q10 = 901 cfs = 582 MGD	High Flow* 7Q10 = 1229 cfs = 794 MGD
30Q10 = 1036 cfs = 669 MGD	High Flow* 30Q10 = 1686 cfs = 1089 MGD
30Q5 = 1158 cfs = 748 MGD	Harmonic Mean* = 2387 cfs = 1542 MGD

Withdrawals by the NRV Regional Water Authority (formerly Blacksburg-Christiansburg-VPI Water Authority) and the Radford Army Ammunition Plant (RAAP) intake #1 are incorporated into the analysis. NRV and RAAP withdrawal data for the five calendar years (2009-2013) before permit reissuance are from the Virginia Water Use Data System and the Virginia Annual Water Withdrawal Reports. Wasted water returned to the New River by the WTPs is not accounted. Discharges from the Christiansburg Wastewater Treatment Plant (WWTP) are also incorporated into the analysis. WWTP monthly average discharge data are from discharge monitoring reports for the same five calendar years (2009-2013).

For a very conservative analysis, maximum daily withdrawal values are calculated for the NRV and RAAP facilities. Maximum daily values are calculated for both high flow and low flow months during 2009-2013. Similarly, minimum daily discharge values for the WTTPP for both high flow and low flow months are used. Withdrawal and discharge data are attached.

For the NRV facility, the highest average monthly withdrawal during the high flow periods* is 6.96 MGD (April 2011 and April 2012). For the RAAP facility, the highest average monthly withdrawal during the high flow periods* is 31.18 MGD (February 2011). For the WWTP, the lowest monthly average discharge during high flow periods* is 1.93 MGD (February 2009). Thus conservative net flow of withdrawals and discharge during high flow periods* is -36.21 MGD.

For the NRV facility, the highest average monthly withdrawal during the low flow periods (June-December) is 7.64 MGD (September 2010). For the RAAP facility, the highest average monthly withdrawal during the low flow periods is 30.42 MGD (December 2011). For the WWTP, the lowest monthly average discharge during low flow periods is 1.88 MGD (July 2010). Thus conservative net flow of withdrawals and discharge during low flow periods is -36.19 MGD.

Accounting for withdrawals and discharges, the flow frequencies at the discharge point are shown below.

New River above discharge point

Drainage Area = 2,791 mi^2

1Q30 = 445 – 36.19 = 409 MGD	
1Q10 = 472 – 36.19 = 436 MGD	High Flow* 1Q10 = 551 – 36.21 = 515 MGD
7Q10 = 582 – 36.19 = 546 MGD	High Flow* 7Q10 = 794 – 36.21 = 758 MGD
30Q10 = 669 – 36.19 = 633 MGD	High Flow* 30Q10 = 1089 – 36.21 = 1053 MGD
30Q5 = 748 – 36.19 = 712 MGD	Harmonic Mean* = 1542 – 36.21 = 1506 MGD

*High flow months are January through May.

Step-by-step flow calculations are in the attached spreadsheet. Gauge flow frequencies were compiled in 2005 with data collected through water year 2003. Subsequent (updated) gauge "low flow" statistics differ 2% or less from those compiled in 2005. Updated gauge "high flow" statistics are not available. Thus "2005" data are used for gauge flows.

FLOW CALCULATIONS

SITE OF INTEREST	DRAINAGE AREA	CALCULATION	HARMEAN	HF30Q10	HF7Q10	HF1Q10	Z30Q5	Z30Q10	Z7Q10	Z1Q10	Z1Q30	UNIT
New River at Radford, Va.	2,748	A	2350	1660	1210	840	1140	1020	887	719	678	cfs
New River above discharge point	2,791	B = 2791/2748 x A	2387	1686	1229	853	1158	1036	901	730	689	cfs
New River above discharge point		C = 0.646 x B	1542	1089	794	551	748	669	582	472	445	MGD
high flow net withdrawal/discharge		D	-36.21	-36.21	-36.21	-36.21						MGD
low flow net withdrawal/discharge		D					-36.19	-36.19	-36.19	-36.19	-36.19	MGD
flow frequency at discharge point		E = C + D	1506	1053	758	515	712	633	546	436	409	MGD

New River average daily withdrawal & discharge data summaries from stream gauge 03171000 to Pepper's Ferry RWTA Outfall 001

NRV Regional Water Authority (formerly Blacksburg-Christiansburg-VPI Water Authority)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2013	6.04	6.74	6.20	6.66	6.37	6.08	6.01	6.13	6.83	6.93	6.49	6.06
2012	6.23	6.71	6.54	6.96	6.59	6.47	6.65	6.74	7.41	7.01	6.31	5.89
2011	6.34	6.93	6.68	6.96	6.40	6.57	6.62	7.25	7.26	7.01	6.32	5.97
2010	6.57	6.94	6.55	6.95	6.56	6.51	6.81	6.95	7.64	6.28	6.45	6.22
2009	6.26	6.85	6.49	6.78	6.53	6.47	6.41	6.11	7.31	6.84	6.44	6.14

high flow maximum withdrawal = 6.96 MGD

low flow maximum withdrawal = 7.64 MGD

Radford Army Ammunition Plant upsteam intake (Bldg. 408)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2013	20.10	18.52	20.52	19.60	15.88	19.37	18.38	19.84	20.52	17.78	16.32	17.08
2012	24.81	20.83	19.33	23.15	23.23	25.11	19.04	17.77	21.60	24.56	22.69	23.12
2011	31.15	31.18	28.36	25.75	24.34	26.90	25.07	29.55	29.89	28.21	28.25	30.42
2010	22.98	23.42	20.31	19.90	19.49	21.51	20.94	25.32	21.03	20.68	20.95	26.43
2009	25.55	26.43	25.23	24.93	23.13	19.37	18.94	18.61	19.33	19.16	21.47	21.32

high flow maximum withdrawal = 31.18 MGD

low flow maximum withdrawal = 30.42 MGD

Christiansburg Wastewater Treatment Plant

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2013	3.6	2.6	2.4	2.8	3.2	2.7	3.7	2.4	2.1	2.1	2.1	2.8
2012	2.2	2.3	2.6	2.1	2.3	2.3	1.9	2.3	2.1	2.1	1.9	2.0
2011	2.1	2.3	2.9	3.0	3.5	2.4	2.1	2.3	2.4	2.5	2.2	2.7
2010	3.303	3.104	3.131	2.386	2.299	2.005	1.875	2.082	2.452	2.175	2.1	1.9
2009	2.298	1.931	2.576	2.382	3.932	3.563	2.773	2.170	2.286	2.182	2.788	3.694

high flow minimum discharge = 1.931 MGD

low flow minimum discharge = 1.875 MGD

high flow net flow adjustment = -36.21 MGD

low flow net flow adjustment = -36.19 MGD

New River Basin

Cause Group Code: **N29R-01-PCB** **New River, Claytor Lake, Peak Creek, Reed Creek and Stony Creek**

Location: The impairment begins at the I-77 bridge crossing the New River and extends downstream to the VA/WVA State Line and includes the tributaries Peak Creek and Reed Creek as described below.

City / County: Giles Co. Montgomery Co. Pulaski Co. Radford City

Use(s): Fish Consumption

Cause(s) /
VA Category: PCB in Fish Tissue/ 5A

The Virginia Department of Health (VDH) issued a fish consumption advisory on August 6, 2001 for polychlorinated biphenyls (PCBs) for the lower portion of the New River (Rt. 114 Bridge downstream to the VA / WVA State Line - 52.0 miles) based on fish tissue collections from Carp. An Advisory extension to Claytor dam was issued 8/06/2003 (11.47 miles) recommends that no carp be consumed in these waters and no more than two meals per month of flathead and channel catfish. The VDH PCB Fish Consumption Advisory was further extended upstream on the New River (13 miles) to the I-77 Bridge to include the lower portions of Peak Creek (4.02 miles), Reed Creek (16.35 miles) and Claytor Lake (4,287 acres) on 12/02/2004. The VDH advises consumption should not exceed two meals per month for carp and smallmouth bass. The VDH level of concern is 50 parts per billion (ppb) in fish tissue.

There are eight fish tissue collection sites within the 2010 data window reporting exceedances of the WQS based 20 ppb fish tissue value (TV) (VDH 50 ppb). These data are reviewed by the VDH in making an advisory determination. A complete listing of collection sites and associated fish tissue data are available at http://www.deq.virginia.gov/fishtissue/fishtissue.html. A more detailed presentation of the data can also be found using an interactive mapping application at http://gisweb.deq.state.va.us/. The VDH Advisory information is also available via the web at http://www.vdh.virginia.gov/Epidemiology/PublicHealthToxicology/Advisories/.

9-SNC000.20- 2004 fish tissue finds with application of the new WQS TV for PCB (20 ppb) the addition of 3 species exceeding the new TV criterion. Rock Bass (size 16-20 cm) at 25.21, SM Bass (size 28.6-30.5 cm) at 22.13 and White sucker (1 fish) at 30.08 ppb. Stony Creek is therefore a 2010 addition based on the new WQS PCB tissue value of 20 ppb.

New River, Claytor Lake, Peak Creek, Reed Creek and Stony Creek **Fish Consumption**	Estuary (Sq. Miles)	Reservoir (Acres)	River (Miles)
PCB in Fish Tissue - Total Impaired Size by Water Type:		**4,286.76**	**76.61**

Sources:

Source Unknown

*Narrative descriptions, Location and City/County describes the entire extent of the Impairment. Sizes may not represent the total overall size of the impairment in terms of stream name only.

Stream Data & Statistics
Hardness, total

Collection Date & Time	mg/L as $CaCO_3$
06/12/2003 09:00	103
04/10/2003 09:30	178
03/10/2003 12:30	91.4
02/11/2003 08:55	73.4
01/22/2003 14:15	93.8
12/12/2002 14:15	69.1
11/20/2002 12:30	106
10/31/2002 09:20	68.7
09/19/2002 09:45	101
08/20/2002 09:30	62.1
07/30/2002 10:50	74.5
06/25/2002 08:30	79.2
05/30/2002 09:15	89.3
04/30/2002 10:30	81.2
03/18/2002 13:00	109
02/25/2002 14:00	47
01/23/2002 10:05	67.8
12/18/2001 13:30	44.5
10/25/2001 13:50	40.1
09/11/2001 09:30	57.6
08/15/2001 12:50	68.9
07/17/2001 10:30	52.1
06/25/2001 08:30	114
05/17/2001 09:00	112
04/10/2001 10:15	73.4
03/08/2001 10:00	28.1
02/06/2001 11:00	155
01/17/2001 11:30	75.3
12/27/2000 13:00	65.4
11/29/2000 10:30	63.3
10/18/2000 10:00	83.4
09/19/2000 09:00	75.9
08/16/2000 13:35	72.4
07/26/2000 09:40	72.6
06/26/2000 09:35	62
05/24/2000 09:05	92
04/06/2000 09:15	59
03/29/2000 12:00	61
02/14/2000 09:00	60.9
01/26/2000 09:15	65.1
mean hardness	**78.7**

Stream Data & Statistics
Temperature

Temp (^{o}C)	Collection Date & Time	Temp (^{o}C)
7.4	12/02/2013 12:00	
12.4	11/18/2013 13:25	
20.1	09/18/2013 11:30	
21.5	07/30/2013 14:10	
21.19	07/11/2013 09:50	
16.5	05/23/2013 12:35	16.5
4.7	03/07/2013 14:05	4.7
6.4	01/15/2013 14:35	6.4
6.6	12/12/2012 11:10	
14.3	10/17/2012 11:30	
21.9	08/22/2012 11:10	
21	06/19/2012 10:30	
13	04/03/2012 10:45	13
5.3	01/25/2012 12:15	5.3
10.2	11/29/2011 11:00	
20.5	09/15/2011 11:15	
23.4	07/19/2011 09:45	
15.6	05/18/2011 08:22	15.6
16.7	05/11/2011 10:30	16.7
10	03/24/2011 10:05	10
1.7	01/20/2011 10:00	1.7
12	11/18/2010 13:50	
16.2	10/25/2010 09:15	
26.1	09/02/2010 14:35	
24.6	07/20/2010 15:10	
20.1	05/26/2010 14:45	20.1
16.7	05/18/2010 09:00	16.7
11.2	03/24/2010 15:00	11.2
8.9	01/28/2010 12:40	8.9
11.6	11/17/2009 15:00	
20.8	09/21/2009 12:20	
21.6	07/21/2009 15:00	
15.1	05/12/2009 10:30	15.1
7.1	03/10/2009 12:25	7.1
5.5	01/22/2009 14:50	5.5
9.6	11/19/2008 12:30	
21.5	09/10/2008 14:20	
21.1	07/02/2008 13:15	
16.4	05/15/2008 13:45	16.4
5.9	03/05/2008 11:00	5.9
5.6	01/23/2008 10:30	5.6
9.7	11/29/2007 10:30	
22.2	09/27/2007 10:00	
23.1	07/17/2007 12:15	
14.8	05/09/2007 12:25	14.8
8.8	03/20/2007 09:15	8.8
6.2	12/14/2006 09:30	
23.2	08/14/2006 10:45	
17.6	06/08/2006 09:50	
9.2	04/06/2006 09:00	9.2
5.1	02/21/2006 10:00	5.1
5.4	12/19/2005 10:45	
13.1	10/27/2005 09:40	
24	08/10/2005 10:00	
17.7	06/07/2005 10:00	
12.08	04/19/2005 09:10	12.08
4.63	02/17/2005 09:30	4.63
11.11	12/01/2004 10:30	
14.3	10/27/2004 09:45	
23.3	08/25/2004 12:30	
20.9	06/22/2004 09:30	
13.73	04/21/2004 15:55	13.73
5.14	02/18/2004 10:15	5.14
22.9	**wet season: Jan - May**	**16.6**
90% annual temp		**90% wet season temp**

Stream Data & Statistics

pH

Collection Date & Time	pH (SU)
12/02/2013 12:00	7.5
11/18/2013 13:25	7.9
09/18/2013 11:30	7.7
07/30/2013 14:10	7.5
07/11/2013 09:50	7.37
05/23/2013 12:35	7.7
03/07/2013 14:05	7.6
01/15/2013 14:35	7.3
12/12/2012 11:10	7.3
10/17/2012 11:30	8.3
08/22/2012 11:10	7.9
06/19/2012 10:30	7.8
04/03/2012 10:45	8.2
01/25/2012 12:15	8.2
11/29/2011 11:00	8.2
09/15/2011 11:15	8.5
07/19/2011 09:45	7.8
05/18/2011 08:22	7.5
05/11/2011 10:30	8.3
03/24/2011 10:05	7.9
01/20/2011 10:00	8.4
11/18/2010 13:50	8.2
10/25/2010 09:15	7.3
09/02/2010 14:35	8
07/20/2010 15:10	8
05/26/2010 14:45	8.3
05/18/2010 09:00	7.4
03/24/2010 15:00	8.3
01/28/2010 12:40	8.2
11/17/2009 15:00	8.1
09/21/2009 12:20	8.2
07/21/2009 15:00	8.5
05/12/2009 10:30	6.8
03/10/2009 12:25	8.2
01/22/2009 14:50	8.2
11/19/2008 12:30	8.3
09/10/2008 14:20	8.2
07/02/2008 13:15	7.5
03/05/2008 11:00	8.1
01/23/2008 10:30	8
11/29/2007 10:30	8.1
09/27/2007 10:00	8.2
07/17/2007 12:15	7.7
05/09/2007 12:25	8.3
03/20/2007 09:15	8.2
12/14/2006 09:30	8.2
08/14/2006 10:45	7.6
06/08/2006 09:50	7
04/06/2006 09:00	6.8
02/21/2006 10:00	7.8
12/19/2005 10:45	7.5
10/27/2005 09:40	7.8
08/10/2005 10:00	7.2
06/07/2005 10:00	7.8
04/19/2005 09:10	8.11
02/17/2005 09:30	8.06
12/01/2004 10:30	7.45
10/27/2004 09:45	7.1
08/25/2004 12:30	7.63
06/22/2004 09:30	7.47
04/21/2004 15:55	7.59
02/18/2004 10:15	7.75
90% maximum pH	**8.3**
10% maximum pH	**7.3**

Stream Data & Statistics

mg/L as N	Ammonia Nitrogen parameter code 610 Collection Date & Time	mg/L as N
0.04	12/14/2006 09:30	
0	08/14/2006 10:45	
0.13	06/08/2006 09:50	
0	04/06/2006 09:00	0
0	02/21/2006 10:00	0
0.04	12/19/2005 10:45	
0	10/27/2005 09:40	
0	08/10/2005 10:00	
0	06/12/2003 09:00	
0	04/10/2003 09:30	0
0.05	03/10/2003 12:30	0.05
0	02/11/2003 08:55	0
0	01/22/2003 14:15	0
0	12/12/2002 14:15	
0.05	11/20/2002 12:30	
0.05	10/31/2002 09:20	
0.05	09/19/2002 09:45	
0.06	08/20/2002 09:30	
0	07/30/2002 10:50	
0	06/25/2002 08:30	
0	05/30/2002 09:15	0
0	04/30/2002 10:30	0
0.04	03/18/2002 13:00	0.04
0	02/25/2002 14:00	0
0	01/23/2002 10:05	0
0	12/18/2001 13:30	
0	10/25/2001 13:50	
0	09/11/2001 09:30	
0	08/15/2001 12:50	
0	07/17/2001 10:30	
0	06/25/2001 08:30	
0	05/17/2001 09:00	0
0.05	04/10/2001 10:15	0.05
0	03/08/2001 10:00	0
0	02/06/2001 11:00	0
0	01/17/2001 11:30	0
0	12/27/2000 13:00	
0.05	11/29/2000 10:30	
0	10/18/2000 10:00	
0	09/19/2000 09:00	
0	08/16/2000 13:35	
0	07/26/2000 09:40	
0	06/26/2000 09:35	
0	05/24/2000 09:05	0
0	04/06/2000 09:15	0
0	03/29/2000 12:00	0
0	02/14/2000 09:00	0
0	01/26/2000 09:15	0
0.01 yearly average	**high flow months January - May**	**0.01 high flow average**

Stream Data & Statistics

Nitrate Nitrogen parameter code 620 Collection Date & Time	mg/L as N
06/12/2003 09:00	1.34
04/10/2003 09:30	2.11
03/10/2003 12:30	1.66
02/11/2003 08:55	1.08
01/22/2003 14:15	1.37
12/12/2002 14:15	1.02
11/20/2002 12:30	1.56
10/31/2002 09:20	0.56
09/19/2002 09:45	0.51
08/20/2002 09:30	0.35
07/30/2002 10:50	0.47
06/25/2002 08:30	0.67
05/30/2002 09:15	0.83
04/30/2002 10:30	0.96
03/18/2002 13:00	1.25
02/25/2002 14:00	0.88
01/23/2002 10:05	0.47
12/18/2001 13:30	0.62
10/25/2001 13:50	0.67
09/11/2001 09:30	0.72
08/15/2001 12:50	1.05
07/17/2001 10:30	0.85
06/25/2001 08:30	1.31
05/17/2001 09:00	1.28
04/10/2001 10:15	0.98
03/08/2001 10:00	0.62
02/06/2001 11:00	1.72
01/17/2001 11:30	0.69
12/27/2000 13:00	0.45
11/29/2000 10:30	0.53
10/18/2000 10:00	0.59
09/19/2000 09:00	0.72
08/16/2000 13:35	0.64
07/26/2000 09:40	0.81
06/26/2000 09:35	0.55
05/24/2000 09:05	1.05
04/06/2000 09:15	0.93
03/29/2000 12:00	0.91
02/14/2000 09:00	0.75
01/26/2000 09:15	1.88
average	**0.94**

Chloride, total parameter code 940 Collection Date & Time	mg/L
06/25/2001 08:30	9.9
05/17/2001 09:00	11.7
04/10/2001 10:15	10.2
03/08/2001 10:00	10
02/06/2001 11:00	15.4
01/17/2001 11:30	9.2
12/27/2000 13:00	8.2
11/29/2000 10:30	8
10/18/2000 10:00	8.6
09/19/2000 09:00	9.1
08/16/2000 13:35	8.1
07/26/2000 09:40	6.4
06/26/2000 09:35	6.6
05/24/2000 09:05	8.8
04/06/2000 09:15	9.1
03/29/2000 12:00	9.2
02/14/2000 09:00	8.1
01/26/2000 09:15	7.5
average	**9.12**

Sulfate, total parameter code 945 Collection Date & Time	mg/L as SO_4
06/25/2001 08:30	9.4
05/17/2001 09:00	10
04/10/2001 10:15	8.9
03/08/2001 10:00	8.6
02/06/2001 11:00	12.2
01/17/2001 11:30	9.3
12/27/2000 13:00	10.1
11/29/2000 10:30	8.4
10/18/2000 10:00	8.7
09/19/2000 09:00	9.3
08/16/2000 13:35	7.9
07/26/2000 09:40	5.7
06/26/2000 09:35	8.1
05/24/2000 09:05	8.7
04/06/2000 09:15	7.7
03/29/2000 12:00	7.6
02/14/2000 09:00	8.3
01/26/2000 09:15	7.5
average	**8.69**

Stream Data & Statistics

Antimony, dissolved parameter code 1095	
Collection Date & Time	**ug/L**
06/26/2001 15:00	0
11/20/1997 10:05	0
average	**0.00**

Arsenic, dissolved parameter code 1000	
Collection Date & Time	**ug/L**
06/26/2001 15:00	0.44
11/20/1997 10:05	0.25
average	**0.35**

Cadmium, dissolved parameter code 1025	
Collection Date & Time	**ug/L**
06/26/2001 15:00	0
11/20/1997 10:05	0
average	**0.00**

Chromium, dissolved parameter code 1030	
Collection Date & Time	**ug/L**
06/26/2001 15:00	0.18
11/20/1997 10:05	0.18
average	**0.18**

Copper, dissolved parameter code 1040	
Collection Date & Time	**ug/L**
06/26/2001 15:00	0.67
11/20/1997 10:05	0.62
average	**0.65**

Iron, dissolved parameter code 1046	
Collection Date & Time	**ug/L**
06/26/2001 15:00	0
11/20/1997 10:05	0
average	**0.00**

Lead, dissolved parameter code 1049	
Collection Date & Time	**ug/L**
06/26/2001 15:00	0
11/20/1997 10:05	0
average	**0.00**

Manganese, dissolved parameter code 1056	
Collection Date & Time	**ug/L**
06/26/2001 15:00	13.23
11/20/1997 10:05	15.4
average	**14.32**

Mercury, dissolved parameter code 50091	
Collection Date & Time	**ug/L**
06/26/2001 15:00	0
average	**0.00**

Nickel, dissolved parameter code 1065	
Collection Date & Time	**ug/L**
06/26/2001 15:00	0.55
11/20/1997 10:05	0.22
average	**0.39**

Selenium, dissolved parameter code 1145	
Collection Date & Time	**ug/L**
06/26/2001 15:00	0
11/20/1997 10:05	0
average	**0.00**

Silver, dissolved parameter code 1075	
Collection Date & Time	**ug/L**
06/26/2001 15:00	0
11/20/1997 10:05	0
average	**0.00**

Thallium, dissolved parameter code 1057	
Collection Date & Time	**ug/L**
06/26/2001 15:00	0
11/20/1997 10:05	0
average	**0.00**

Zinc, dissolved parameter code 1090	
Collection Date & Time	**ug/L**
06/26/2001 15:00	5.93
11/20/1997 10:05	1.42
average	**3.68**

APPENDIX B

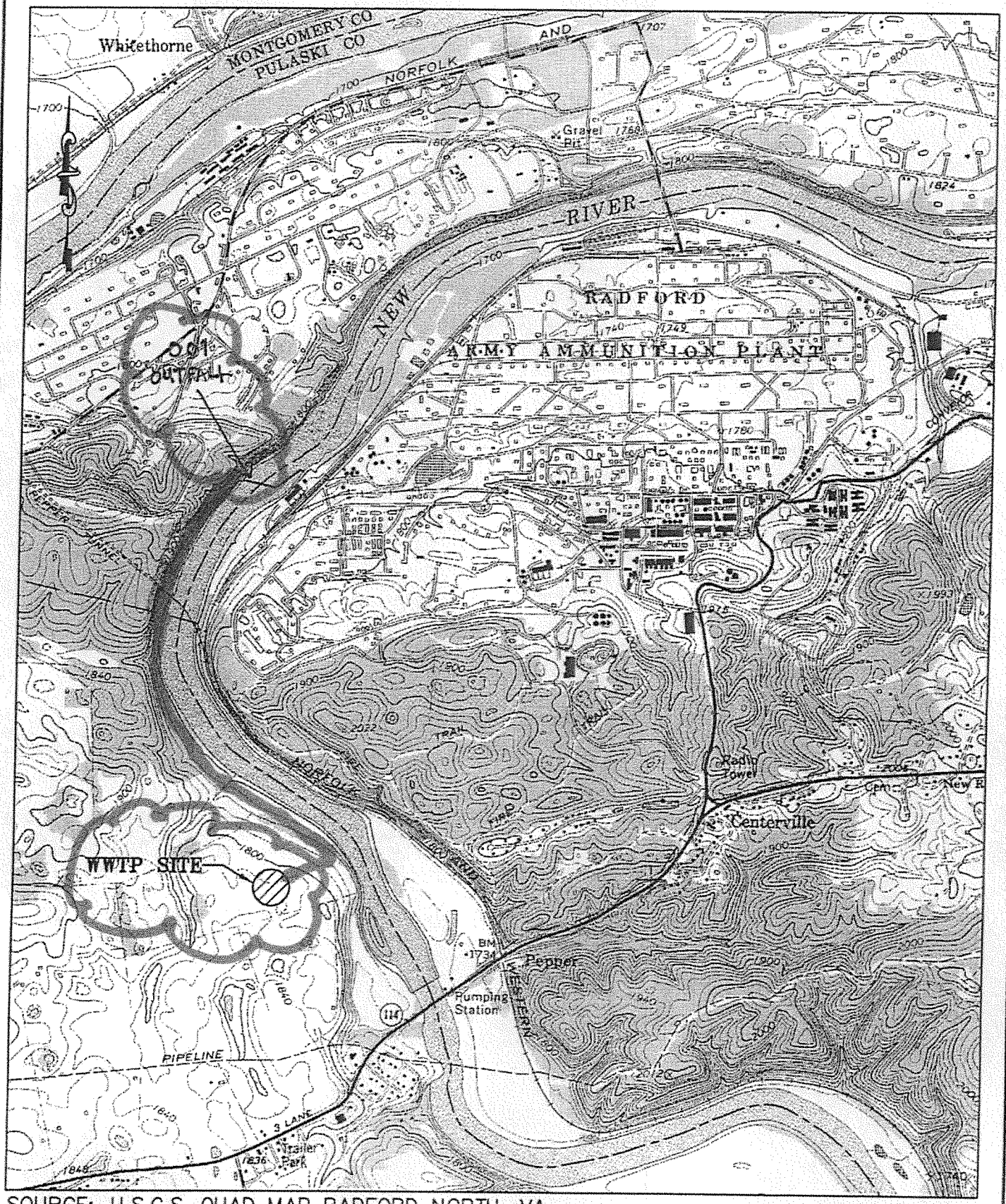
FACILITY INFORMATION

Location (Topographic) Map

Wastewater Treatment Process Schematic

Wastewater Treatment Process Narrative

Site Visit Report



SOURCE: U.S.G.S. QUAD MAP RADFORD NORTH, VA

0 1000 2000

1 inch = 2,000 ft.

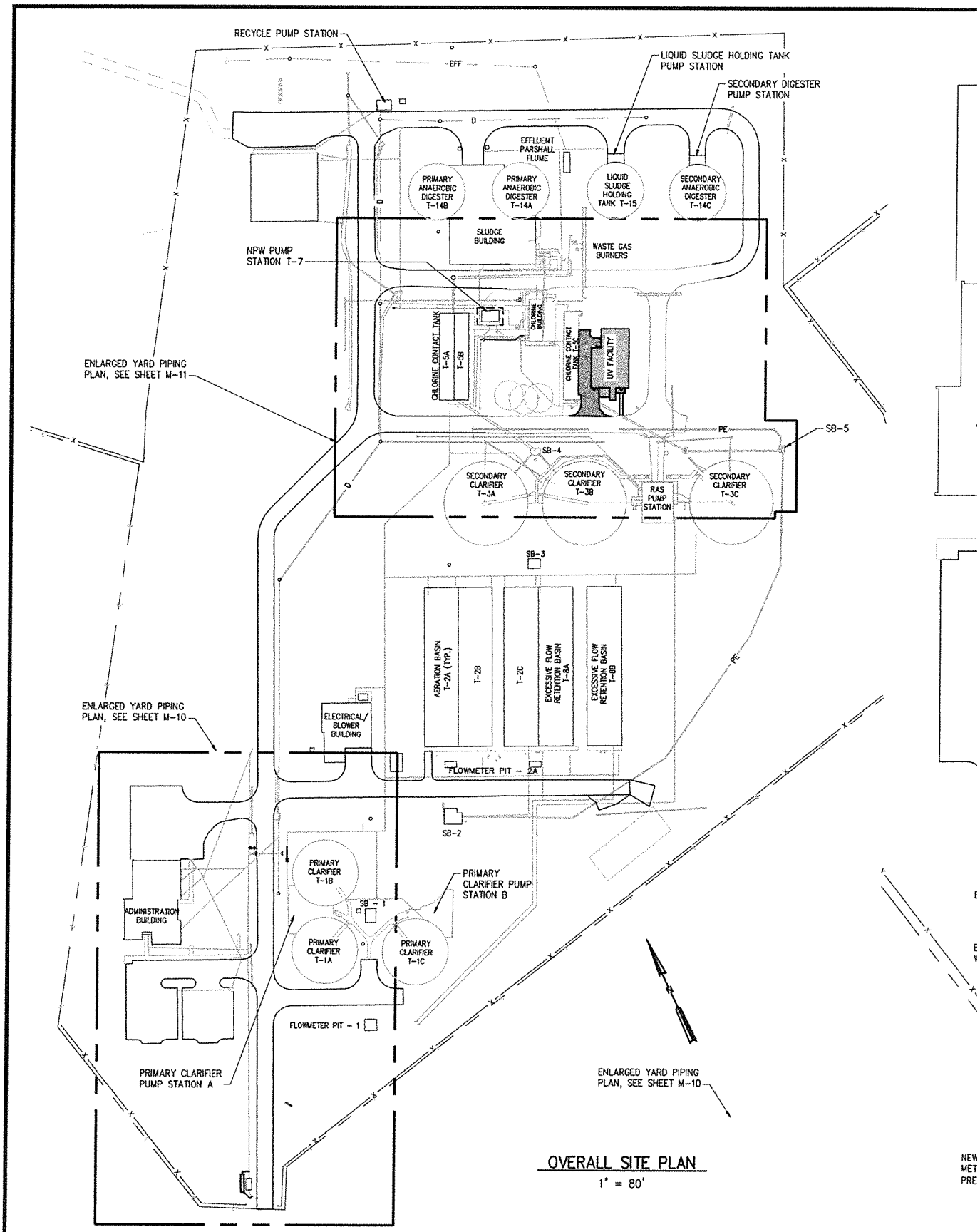
PFRWTA
WWTP SITE LOCATION

Scale: 1"=2,000'

Figure 1-2

\\11050.27\PEROCT2001\

OLVER INCORPORATED



OVERALL SITE PLAN

1" = 80'

NO.	ISSUED FOR	DATE	BY
2	RECORD DRAWING	11/9/2012	RLT
1	BID	2/11/2011	RLT
0	PERMIT APPROVAL	2/3/2011	RLT

DESIGNED MPV\PDS
DRAWN HRL
CHECKED
PROJ.ENGR. JRC
APPROVED

THIS DOCUMENT ORIGINALLY ISSUED FOR CONSTRUCTION AND SEALED BY RONALD L. TAYLOR, SEAL NUMBER 24649.

THIS DOCUMENT ORIGINALLY ISSUED FOR CONSTRUCTION AND SEALED BY JANICE R. CARROLL, SEAL NUMBER 34408.

RECORD DRAWING

THIS DRAWING HAS BEEN MODIFIED TO REFLECT FIELD CHANGES REPORTED BY THE CONTRACTOR OR ANOTHER PARTY, BUT NOT VERIFIED BY THE CERTIFYING ENGINEER

COMMONWEALTH OF VIRGINIA
RONALD L. TAYLOR
024649
11/9/12
PROFESSIONAL ENGINEER

HA
Envir
Cer

PEPPER'S FERRY REGIONAL WASTEWATER TREATMENT FACILITY PROCESS FLOW NARRATIVE

The drawing depicts the major facilities of the plant site. Pink coded units are influent structures (Flow meter Pit-1, and Splitter Box: SB-1) and primary treatment units (Primary Clarifiers T-1A, B, & C). Blue coding depicts the biological treatment (Aeration Basins T-2A, B, & C), Secondary Clarification (Secondary Clarifiers T-3A, B, & C) along with UV disinfection and NPW pumping. Green coding depicts the solids handling and dewatering facilities where solids are stabilized by anaerobic digesters (T-14 A, & B), and stored as liquid biosolids (T-15, volume: 750,000 gallons) or as dewatered biosolids within the dry sludge storage building (capacity: 160 dry tons). Methane gas is stored in the secondary anaerobic digester/ gas holder (24,000 cu ft) (T-14C).

The daily average flow is 4.6 MGD, and this flow may be split evenly (1.53 MGD) to each of three primary clarifiers (volume: 565,000 gallons each). Thickened primary sludge (5.8% solids) is pumped directly to the primary digesters (Volume: 750,000 each) at a rate of 8,000 gpd. The primary clarifier effluent flows evenly (1.53 MGD) into three aeration basins (volume: 875,000 gallons each), and after a minimum of 6 hours, the mixed liquor flows are evenly split (1.53 MGD) into three secondary clarifiers (volume: 780,000 gallons each). Activated sludge is returned evenly at a flow paced rate from each clarifier to each of the aeration basins, or wasted (approx. 45,000 gallons each day) to the anaerobic digesters after thickening. Secondary effluent flows are combined before entering the UV disinfection facility (capacity: 24 MGD) prior to effluent metering and sampling at the parshall flume which is included within the UV Facility.

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MEMORANDUM
VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY
WATER DIVISION
Blue Ridge Regional Office

Subject: Site Visit for Reissuance of VPDES Permit VA0062685 – Pepper's Ferry Regional Wastewater Treatment Authority

To: Permit File

From: Bob Tate, Water Permit Writer

Date: February 10, 2014

Introduction

The Pepper's Ferry Regional Wastewater Treatment Authority Facility (facility) was visited Friday morning, February 7, 2014, for VPDES permit reissuance. The site visit consisted of a tour of wastewater treatment operations and observations at the outfall.

Previously on January 2, 2014, the permit writer met on-site with Clarke Wallcraft (executive director), Mac McCutchan (plant superintendent), and Robbie Graham (technical services manager). Discussions concerned the permit reissuance application and included storm water coverage, ultraviolet disinfection, biosolids, and PCB monitoring. The facility will reregister for the VPDES Industrial Storm Water General Permit rather than include storm water coverage in the individual permit. Ultraviolet disinfection has replaced chlorine disinfection, and the next permit will reflect that change. The next permit's biosolids components are expected to comprise a separate section (Part III) with content updated to current biosolids regulations. The current permit requires two rounds of PCB monitoring during dry conditions for development of a New River PCB TMDL. "Dry monitoring" was completed in accordance with the permit. The permit writer neglected to include in the current permit two rounds of monitoring during wet conditions. DEQ TMDL staff expressed a need for "wet monitoring." Facility staff agreed to try and conduct two rounds of "wet monitoring" before the current permit expires September 30, 2014.

Wastewater Treatment

Mike Hutchinson and Allen McMillan led the writer around the facility to observe treatment units and processes. Operation observations began at the headworks where all raw wastewater enters the facility. At the headworks raw wastewater is screened and grit is removed. Wastewater is pumped from the headworks to the primary clarifiers. Between the headworks and primary clarifiers recycle flows enter the stream and then the stream is metered. A splitter directs wastewater flow to one of three circular primary clarifiers. Two primary clarifiers were operating, which is normal. Primary sludge is pumped to the sludge handling building. Primary clarifier effluent flows by gravity to a splitter which directs flow to one of three rectangular

aeration (activated sludge) basins. Two aeration basins were operating (normal). Air is provided by fine bubble diffusers. (Two new turbo blowers replaced the previous three roots blowers. A third turbo blower will be operational in spring 2014.) The long aeration basins and low flows promote nitrification. Lime added at the New River Pump Station provides alkalinity consumed during nitrification. After a minimum of six hours, aeration basin effluent (gravity) flows to a splitter that directs wastewater to one of three circular secondary clarifiers. All three secondary clarifiers were operating (normal). Secondary (activated) sludge is either returned (pumped) to the aeration basins or wasted (pumped) to the sludge handling building. Secondary clarifier effluent (gravity) flows to the new ultraviolet (UV) disinfection building. UV disinfection replaced chlorine disinfection in July of 2012. The disinfection unit consists of 4 operational channels, each designed for 6 MGD (max) operation. Each channel has two banks of UV bulbs. The unit is controlled automatically, or manually when desired. Two channels were operating (normal). A fifth channel is in place but is not equipped. Sampling for BOD, TSS, and *E. coli* analyses is immediately after disinfection. Other parameters, including (pH, dissolved oxygen, temperature, are monitored approximately 180 feet downstream. Effluent flow is metered at a Parshall flume. Treated effluent flows (by gravity) through 5700' of 36"-48" pipe to Outfall 001 on the New River.

Two retention basins are available for flows in excess of treatment capacity. Raw wastewater is pumped from the retention basins back to the head works. Both retention basins were empty. The primary diversion line in no longer usable. This line (from the primary clarifiers to the chlorine contact tanks) allowed secondary treatment processes to be bypassed when the facility received extremely high flows.

Sludge Treatment and Disposal

Waste sludge from the secondary clarifiers is pumped to the sludge handling building for thickening by dissolved air floatation (DAF). Polymer feed for DAF is available. Thickened secondary sludge goes to one of two primary (anaerobic) digesters. Sludge from the primary clarifiers is pumped to the primary digesters without thickening. In the primary digesters, gas cannons create violent mixing. If additional alkalinity is needed, lime can be added via the thickened sludge pit and pumped to the digester using thickened sludge pumps. From the primary digesters, stabilized sludge and methane gas go to a single secondary digester that temporarily holds gas and sludge. Sludge settles and decant is pumped to the headworks. Methane gas is captured and stored to heat digesters. Stabilized (digested) sludge is stored until dewatered by a belt-filter press with polymer feed. Fully treated sludge is stored dry under roof. There are two options for disposal of treated dry sludge. The preferred option is application to local farm fields as biosolids. The backup option is disposal at a local sanitary landfill (New River Solid Waste Management Area). The facility supervises land application processes. Facility staff includes one licensed nutrient management planners and four certified biosolids land appliers.

Outfalls

There are three outfalls for the facility: one (001) for treated wastewater and two (001 and 002) for storm water. Storm water was not observed or evaluated at the site visit because the facility is registered for the VPDES Industrial Storm Water General Permit.

The treated wastewater outfall (001) is located over a mile from the facility site. The discharge pipe is grated and anchored/embedded in concrete. No foaming was observed near the outfall. The outfall location prevents effluent from reaching the Radford Army Ammunition Plant's raw water intake across the river. The intake is shielded from effluent by a rock-walled diversion channel.

Other

A septage receiving station is located beside the sludge handling building. Drying beds are available for dewatering grit and other materials from jurisdictional public works departments. Non-potable water pumps are now located in the UV building. Backup power is provided by two generators (600 KW and 450 KW) inside the disinfection building. These generators will be replaced by a 1000 KW generator to be located outside. The Radford Pump Station and the New River Pump Station/Equalization Basin were not visited. These two facilities and their associated force mains are owned and operated by the Pepper's Ferry Regional Wastewater Treatment Authority. Other pumps stations and sewer lines are owned and operated by local government affiliated organizations.

The following stream observations were made at the outfall. Some observations were made or confirmed using aerial photos (photo) on DEQ's GIS site.

cross-section: wide shallow arc (difficult to determine)
channel: straight for ¾ mile, slight bends for 2 miles, 90 degree bend for 1¼ mile (photo)
pool and riffle character: yes – 50% pools and 50% riffles for first 1,500 feet (photo)
bottom: rock – small, large and boulders
sludge deposits: none
vegetation: no rooted plants; some algae on nearby rocks (unable to observe beyond)
estimated stream width: 325 feet – 600 feet (photo)
estimated depth (maximum): unable to determine
stream relatively clear with some green color

Stream flow appeared to be greater the 7Q10.

APPENDIX C

EFFLUENT DATA

DMR Data Summaries
Flow
pH
BOD
TSS
DO
E. coli

Hardness Monitoring

Daily Monitoring in 2013
Temperature
pH

PCB Monitoring

DMR Data Summary
Flow

Due Date	Quantity Average	Quantity Maximum
10-Jan-14	5.1	11.7
10-Dec-13	3.9	7.1
10-Nov-13	3.8	6.8
10-Oct-13	4.0	4.6
10-Sep-13	4.48	6.96
10-Aug-13	6.1	12.3
10-Jul-13	4.5	8.6
10-Jun-13	4.7	8.3
10-May-13	4.8	8.1
10-Apr-13	4.2	6.3
10-Mar-13	4.4	8.5
10-Feb-13	5.0	12.8
10-Jan-13	3.0	5.2
10-Dec-12	2.9	3.9
10-Nov-12	3.1	4.4
10-Oct-12	3.3	6.3
10-Sep-12	3.7	5.9
10-Aug-12	4.4	5.8
10-Jul-12	4.6	8.0
10-Jun-12	4.6	5.8
10-May-12	5.3	8.7
10-Apr-12	5.5	8.4
10-Mar-12	4.9	9.2
10-Feb-12	4.4	5.9
10-Jan-12	4.7	8.6
10-Dec-11	4.2	6.6
10-Nov-11	3.9	7.0
10-Oct-11	4.2	11.3
10-Sep-11	3.2	3.9
10-Aug-11	3.3	4.7
10-Jul-11	3.4	3.9
10-Jun-11	4.5	8.6
10-May-11	6.0	9.1
10-Apr-11	5.9	10.1
10-Mar-11	4.2	6.9
10-Feb-11	3.9	4.4
10-Jan-11	4.0	10.7
10-Dec-10	3.7	6.0
10-Nov-10	3.6	4.8
10-Oct-10	3.4	5.6
10-Sep-10	3.1	4.5
10-Aug-10	2.9	3.9
10-Jul-10	2.9	3.4
10-Jun-10	3.2	4.3
10-May-10	5.0	6.5
10-Apr-10	7.3	13
10-Mar-10	6.3	8.8
10-Feb-10	6.9	16.8
10-Jan-10	7.4	14.1
10-Dec-09	5.1	13.6
max value	**7.4**	**16.8**
	no limit	**no limit**
design	**9.0**	**9.0**

DMR Data Summary
pH

Due Date	Concentration Minimum	Concentration Maximum
10-Jan-14	6.8	7.5
10-Dec-13	7.0	7.4
10-Nov-13	7.0	7.4
10-Oct-13	7.1	7.5
10-Sep-13	7.1	7.4
10-Aug-13	6.9	7.4
10-Jul-13	6.9	7.4
10-Jun-13	6.9	7.3
10-May-13	6.8	7.3
10-Apr-13	6.5	7.3
10-Mar-13	6.7	7.4
10-Feb-13	6.7	7.3
10-Jan-13	7.0	7.3
10-Dec-12	7.0	7.7
10-Nov-12	7.1	7.7
10-Oct-12	6.9	7.5
10-Sep-12	7.0	7.8
10-Aug-12	7.0	7.4
10-Jul-12	7.1	7.5
10-Jun-12	6.7	7.4
10-May-12	6.5	7.1
10-Apr-12	6.0	7.0
10-Mar-12	6.2	7.0
10-Feb-12	6.0	6.9
10-Jan-12	6.3	6.9
10-Dec-11	6.4	7.0
10-Nov-11	6.4	7.2
10-Oct-11	6.4	7.1
10-Sep-11	6.3	7.2
10-Aug-11	6.4	7.0
10-Jul-11	6.3	7.0
10-Jun-11	6.3	7.1
10-May-11	6.2	7.1
10-Apr-11	6.1	7.1
10-Mar-11	6.2	7.1
10-Feb-11	6.3	7.3
10-Jan-11	6.3	7.2
10-Dec-10	6.4	7.2
10-Nov-10	6.2	7.2
10-Oct-10	6.4	7.3
10-Sep-10	6.4	7.2
10-Aug-10	6.1	7.2
10-Jul-10	6.4	7.3
10-Jun-10	6.5	7.2
10-May-10	6.3	7.2
10-Apr-10	6.2	7.3
10-Mar-10	6.4	7.2
10-Feb-10	6.2	7.2
10-Jan-10	6.2	7.2
10-Dec-09	6.3	7.4
min/max values	**6.0**	**6.9**
limit	**6.0**	**9.0**

DMR Data Summary
Biochemical Oxygen Demand

Due Date	Quantity Average	Quantity Maximum	Concentration Average	Concentration Maximum
10-Jan-14	68	122	3	4
10-Dec-13	91	129	6	7
10-Nov-13	33	44	2	3
10-Oct-13	3	12	<QL	1
10-Sep-13	16	13	1	1
10-Aug-13	15	<QL	1	<QL
10-Jul-13	19	46	1	3
10-Jun-13	37	58	2	2
10-May-13	78	118	4	6
10-Apr-13	72	105	4	6
10-Mar-13	9	<QL	0.4	<QL
10-Feb-13	120	132	5	4
10-Jan-13	64	75	5	6
10-Dec-12	59	77	5	7
10-Nov-12	18	21	1	2
10-Oct-12	4	17	<1	<1
10-Sep-12	<QL	<QL	<QL	<QL
10-Aug-12	<QL	<QL	<QL	<QL
10-Jul-12	<QL	<QL	<QL	<QL
10-Jun-12	3	0	<1	0
10-May-12	41	100	2	4
10-Apr-12	16	72	1	4
10-Mar-12	83	130	4	6
10-Feb-12	83	120	5	6
10-Jan-12	50	94	3	6
10-Dec-11	5	21	<1	1
10-Nov-11	18	72	1	3
10-Oct-11	12	39	1	3
10-Sep-11	<QL	<QL	<QL	<QL
10-Aug-11	<QL	<QL	<QL	<QL
10-Jul-11	<QL	<QL	<QL	<QL
10-Jun-11	23	39	1	2
10-May-11	18	40	1	2
10-Apr-11	391	1502	13	44
10-Mar-11	63	61	4	3
10-Feb-11	78	84	5	6
10-Jan-11	47	58	3	4
10-Dec-10	12	17	1	1
10-Nov-10	6	18	<QL	1
10-Oct-10	9	30	1	2
10-Sep-10	<QL	<QL	<QL	<QL
10-Aug-10	<QL	<QL	<QL	<QL
10-Jul-10	5	<QL	<QL	<QL
10-Jun-10	64	99	5	8
10-May-10	31	54	2	3
10-Apr-10	90	134	3	5
10-Mar-10	122	183	5	7
10-Feb-10	221	312	8	9
10-Jan-10	244	289	9	9
10-Dec-09	76	181	4	7
max value	**391**	**1502**	**13**	**44**
limit	**1022**	**1533**	**30**	**45**

DMR Data Summary
Total Suspended Solids

Due Date	Quantity Average	Quantity Maximum	Concentration Average	Concentration Maximum
10-Jan-14	256	393	12	16
10-Dec-13	232	308	15	17
10-Nov-13	175	199	12	15
10-Oct-13	157	216	10	14
10-Sep-13	143	171	8	10
10-Aug-13	177	189	8	9
10-Jul-13	175	269	10	13
10-Jun-13	184	237	11	10
10-May-13	227	259	12	13
10-Apr-13	171	234	11	14
10-Mar-13	101	83	6	5
10-Feb-13	481	923	18	26
10-Jan-13	173	201	15	17
10-Dec-12	179	202	16	17
10-Nov-12	106	106	9	9
10-Oct-12	103	171	8	11
10-Sep-12	69	103	5	6
10-Aug-12	98	122	6	7
10-Jul-12	97	109	6	7
10-Jun-12	65	83	4	5
10-May-12	145	230	7	9
10-Apr-12	151	175	7	8
10-Mar-12	235	265	13	14
10-Feb-12	244	297	15	18
10-Jan-12	247	282	14	18
10-Dec-11	100	108	6	8
10-Nov-11	133	268	8	14
10-Oct-11	113	164	7	12
10-Sep-11	40	41	3	3
10-Aug-11	48	62	4	5
10-Jul-11	86	99	7	8
10-Jun-11	206	296	12	15
10-May-11	169	206	7	8
10-Apr-11	714	2574	24	76
10-Mar-11	177	182	11	11
10-Feb-11	185	227	13	15
10-Jan-11	172	159	11	11
10-Dec-10	135	131	10	11
10-Nov-10	122	172	9	14
10-Oct-10	95	123	8	10
10-Sep-10	86	120	7	9
10-Aug-10	45	61	4	6
10-Jul-10	58	58	5	5
10-Jun-10	154	226	13	17
10-May-10	125	150	7	8
10-Apr-10	256	323	9	10
10-Mar-10	278	352	11	13
10-Feb-10	443	698	17	18
10-Jan-10	563	698	20	22
10-Dec-09	262	391	13	15
max value	**714**	**2574**	**24**	**76**
limit	**1022**	**1533**	**30**	**45**

DMR Data Summary
Dissolved Oxygen

Due Date	Concentration Minimum
10-Jan-14	8.8
10-Dec-13	8.1
10-Nov-13	7.6
10-Oct-13	7.4
10-Sep-13	7.5
10-Aug-13	7.7
10-Jul-13	7.9
10-Jun-13	8.2
10-May-13	9.0
10-Apr-13	9.8
10-Mar-13	9.9
10-Feb-13	9.8
10-Jan-13	8.7
10-Dec-12	8.6
10-Nov-12	7.6
10-Oct-12	7.0
10-Sep-12	7.2
10-Aug-12	7.1
10-Jul-12	7.9
10-Jun-12	8.4
10-May-12	8.5
10-Apr-12	9.0
10-Mar-12	9.2
10-Feb-12	9.4
10-Jan-12	9.0
10-Dec-11	8.4
10-Nov-11	7.3
10-Oct-11	7.5
10-Sep-11	6.6
10-Aug-11	7.2
10-Jul-11	7.7
10-Jun-11	8.6
10-May-11	8.8
10-Apr-11	9.7
10-Mar-11	9.9
10-Feb-11	10.4
10-Jan-11	9.4
10-Dec-10	8.5
10-Nov-10	7.8
10-Oct-10	6.1
10-Sep-10	7.1
10-Aug-10	6.6
10-Jul-10	6.9
10-Jun-10	7.6
10-May-10	8.5
10-Apr-10	10.2
10-Mar-10	10.4
10-Feb-10	10.4
10-Jan-10	9.4
10-Dec-09	8.7
min value	**6.1**
limit	**6.0**

DMR Data Summary
E. coli Bacteria

Due Date	Concentration Average
10-Jan-14	6
10-Dec-13	8
10-Nov-13	9
10-Oct-13	5
10-Sep-13	5
10-Aug-13	6
10-Jul-13	5
10-Jun-13	5
10-May-13	5
10-Apr-13	22
10-Mar-13	15
10-Feb-13	11
10-Jan-13	43
10-Dec-12	12
10-Nov-12	17
10-Oct-12	10
10-Sep-12	14
10-Aug-12	8
10-Jul-12	17
10-Jun-12	6
10-May-12	1
10-Apr-12	1
10-Mar-12	1
10-Feb-12	1
10-Jan-12	4
10-Dec-11	3
10-Nov-11	33
10-Oct-11	6
10-Sep-11	1
10-Aug-11	5
10-Jul-11	1
10-Jun-11	7
10-May-11	7
10-Apr-11	1
10-Mar-11	1
10-Feb-11	<1
10-Jan-11	2
10-Dec-10	1
10-Nov-10	2
10-Oct-10	3
10-Sep-10	1
10-Aug-10	1
10-Jul-10	4
10-Jun-10	3
10-May-10	2
10-Apr-10	2
10-Mar-10	2
10-Feb-10	1
10-Jan-10	6
10-Dec-09	43
max value	**43**
limit	**126**

Pepper's Ferry Regional Wastewater Treatment Authority
Effluent Hardness

Event	Sampling Dates	mg/l as $CaCO_3$
WET	Oct 3-4, 2010	229
WET	Oct 5-6, 2010	222
WET	Oct 7-8, 2010	232
WET	Oct 9-10, 2011	237
WET	Oct 11-12, 2011	225
WET	Oct 13-14, 2011	205
WET	Sept 23-24, 2012	229
WET	Sept 25-26, 2012	207
WET	Sept 27-28, 2012	215
WET	Oct 13-14, 2013	235
WET	Oct 15-16, 2013	187
WET	Oct 17-18, 2013	188
app	Aug 13-14, 2013	243
app	Aug 15-16, 2013	236
app	Aug 21-22, 2013	258
	mean	**223**

WET - sampling for toxicity testing
app - application monitoring

Pepper's Ferry Regional Wastewater Treatment Authority
Daily Effluent Temperature
January 1, 2013 through December 31, 2013

wet season: January - May

90% annual temperature = 23 °C
90% wet season temperature = 18 °C

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Day
1	13	11	12	13	17	21	21	22	24	23	20	14	1
2	13	12	12	13	17	21	22	22	24	23	19	15	2
3	13	11	11	13	18	20	22	23	25	23	19	16	3
4	14	11	11	14	17	20	22	23	24	23	19	16	4
5	14	12	11	13	17	20	21	22	24	23	19	16	5
6	13	12	12	13	17	20	21	23	24	23	20	17	6
7	13	12	12	14	16	20	22	23	24	22	19	16	7
8	13	12	12	15	16	20	22	23	24	22	18	15	8
9	13	12	12	15	17	20	22	24	24	21	18	15	9
10	15	12	13	15	17	21	22	24	25	21	18	14	10
11	14	13	11	16	17	20	22	24	24	21	18	14	11
12	15	13	10	16	16	21	21	24	24	21	17	14	12
13	15	13	10	15	16	21	21	23	24	22	18	14	13
14	15	13	10	16	16	20	22	23	23	22	18	14	14
15	14	13	10	15	18	20	22	23	23	22	18	14	15
16	14	12	10	16	18	21	23	23	23	21	19	14	16
17	12	11	10	16	18	22	23	22	22	21	18	14	17
18	13	12	10	16	18	21	23	22	23	21	18	13	18
19	12	13	13	16	18	22	23	22	22	20	17	14	19
20	12	12	13	16	19	22	23	23	23	21	17	14	20
21	12	12	12	15	19	22	24	23	23	21	18	14	21
22	12	12	12	16	19	22	24	23	22	21	18	15	22
23	11	12	13	16	19	22	23	24	23	18	18	14	23
24	12	13	12	17	18	22	23	24	23	19	16	13	24
25	8	13	12	16	18	22	23	23	22	18	15	12	25
26	12	12	12	17	18	23	23	24	23	18	15	12	26
27	12	12	12	17	19	22	22	24	23	19	14	12	27
28	13	12	12	16	19	22	23	24	23	19	13	12	28
29	14		14	16	20	22	23	25	22	20	14	13	29
30	14		13	17	20	23	22	24	22	20	14	12	30
31	12		13		20		22	25		20		12	31

Pepper's Ferry Regional Wastewater Treatment Authority
Daily Effluent pH
January 1, 2013 through December 31, 2013

90% maximum pH = 7.3 SU
10% maximum pH = 6.9 SU

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Day
1	7.1	6.7	7.2	7.3	7.0	7.2	7.3	7.3	7.3	7.3	7.2	7.3	1
2	7.0	6.8	7.0	6.9	7.1	7.2	7.2	7.2	7.2	7.3	7.3	7.1	2
3	7.1	7.1	6.9	7.1	6.9	7.3	7.1	7.3	7.4	7.1	7.2	7.0	3
4	7.0	7.1	6.8	7.2	6.9	7.1	6.9	7.4	7.2	7.2	7.2	7.2	4
5	7.1	6.8	7.2	7.0	7.2	7.1	7.0	7.2	7.2	7.0	7.1	7.1	5
6	7.1	7.2	6.8	7.1	7.2	6.9	7.2	7.3	7.1	7.3	7.2	7.0	6
7	7.2	7.2	6.7	6.8	7.2	7.0	7.1	7.2	7.2	7.0	7.2	7.1	7
8	7.2	7.1	6.7	7.0	7.0	7.1	7.0	7.2	7.4	7.3	7.3	7.1	8
9	7.2	7.3	7.1	6.9	6.9	7.1	7.0	7.3	7.2	7.2	7.2	7.2	9
10	7.0	7.0	7.3	7.2	6.9	6.9	7.1	7.3	7.3	7.2	7.2	7.5	10
11	7.0	6.9	6.7	7.1	7.0	7.0	7.1	7.2	7.3	7.3	7.3	7.1	11
12	7.1	7.0	7.2	6.9	7.2	7.0	7.2	7.2	7.2	7.2	7.3	7.2	12
13	7.2	7.4	6.8	7.1	7.2	7.1	7.2	7.2	7.3	7.3	7.2	7.2	13
14	7.2	7.3	6.7	7.0	7.3	7.2	7.3	7.2	7.2	7.2	7.2	7.3	14
15	6.8	7.3	6.7	6.8	7.2	7.2	7.1	7.3	7.4	7.3	7.3	7.2	15
16	6.7	6.7	6.8	6.9	7.1	7.3	7.2	7.3	7.5	7.1	7.2	7.0	16
17	6.8	6.7	6.8	7.0	7.0	7.2	7.2	7.4	7.4	7.1	7.3	7.1	17
18	6.7	6.7	6.5	7.1	7.0	7.2	7.1	7.3	7.3	7.3	7.2	7.2	18
19	6.8	6.8	7.2	7.2	7.2	7.2	7.2	7.1	7.4	7.2	7.1	7.3	19
20	7.0	7.3	7.3	7.0	7.3	7.4	7.1	7.1	7.2	7.3	7.1	7.2	20
21	7.1	6.8	6.9	7.1	7.2	7.3	7.2	7.2	7.3	7.4	7.0	7.3	21
22	7.0	7.1	7.0	7.1	7.1	7.4	7.2	7.3	7.3	7.2	7.1	7.2	22
23	7.1	7.3	6.9	6.9	7.0	7.4	7.3	7.3	7.3	7.3	7.2	6.8	23
24	6.8	6.8	7.2	7.0	7.1	7.3	7.2	7.3	7.2	7.4	7.4	7.1	24
25	6.8	6.9	7.1	7.2	7.0	7.2	7.2	7.2	7.3	7.3	7.3	7.2	25
26	7.0	6.9	7.2	7.2	7.2	7.3	7.2	7.2	7.1	7.3	7.2	7.4	26
27	7.1	7.3	7.2	7.2	7.3	7.2	7.1	7.3	7.3	7.4	7.1	7.3	27
28	7.0	7.1	6.9	7.2	7.3	7.3	7.2	7.3	7.3	7.2	7.2	7.2	28
29	7.3		7.1	7.2	7.0	7.3	7.3	7.3	7.2	7.2	7.3	6.8	29
30	7.3		7.0	7.2	7.1	7.3	7.4	7.1	7.3	7.1	7.2	6.9	30
31	6.7		7.1		7.1		7.4	7.2		7.3		7.2	31

Pepper's Ferry RWTA PCB Data - VPDES Permit No. VA0062685

Dry 1

	Effluent sample #1
Sample_ID	Outfall 001 Eff.
Lab_Sample_ID	2714002
Lab_Name	Cape Fear
Sample_Matrix	Water (whole)
Percent_Mositure	0
Percent_Lipid	
QC_Code	SA
Sample_Date	8/30/2011
Sample_Time	13:37
Analysis_Performed	EPA Method 1668A
Extraction_Date	9/15/2011
Analysis_Date	9/20/2011
Analysis_Time	20:40
Sample_Size	1985

Summary	Uncensored tPCB unadj (pg/L)	** Censored ** Compared to largest blnk (X5) & corrected tPCB adj (pg/L)	OPR (ok)	Extraction, Cleanup & Injection stds (ok)
Outfall 001 Eff.	**546.556**	49.925		ok
Field Equipment Blank	**0**	0		
Eff 3	**0**	0		
Eff 4	**0**	0		
Eff 5	**0**	0	ok	
Method Blank	**163.63**			ok
Field Equipment Blank	**209.997**			ok

Dry 2

	Effluent sample #1
Sample_ID	VA0062685-001-DW-09302011
Lab_Sample_ID	2833002
Lab_Name	Cape Fear
Sample_Matrix	
Percent_Mositure	0
Percent_Lipid	
QC_Code	SA
Sample_Date	9/30/2011
Sample_Time	8:45
Analysis_Performed	EPA Method 1668A
Extraction_Date	10/6/2011
Analysis_Date	10/22/2011
Analysis_Time	2:23
Sample_Size	1983

Summary	Uncensored tPCB unadj (pg/L)	** Censored ** Compared to largest blnk (X5) & corrected tPCB adj (pg/L)	OPR (ok)	Extraction, Cleanup & Injection stds (ok)
VA0062685-001-DW-09302011	**2450.553**	2285.053		ok
VA0062685-001-DUP-09302011DUP	**203.066**	3.55		
Eff 3	**0**	0		
Eff 4	**0**	0		
Eff 5	**0**	0	ok	
Method Blank	**211.5**			ok
VA0062685-001-FB-09292011	**195.597**			

Believed to be a blank rather than duplicate sample

Wet 1

	Effluent sample #1
Sample_ID	VA0062685-001-WW-06242014
Lab_Sample_ID	6289002
Lab_Name	Cape Fear
Sample_Matrix	Water (whole)
Percent_Mositure	0
Percent_Lipid	
QC_Code	SA
Sample_Date	6/24/2014
Sample_Time	13:30
Analysis_Performed	EPA Method 1668A
Extraction_Date	7/1/2014
Analysis_Date	7/16/2014
Analysis_Time	13:57
Sample_Size	2193

Summary	Uncensored tPCB unadj (pg/L)	** Censored ** Compared to largest blnk (X5) & corrected tPCB adj (pg/L)	OPR (ok)	Extraction, Cleanup & Injection stds (ok)
VA0062685-001-WW-06242014	**480.515**	164.221		ok
Eff 2	**0**	0		
Eff 3	**0**	0		
Eff 4	**0**	0		
Eff 5	**0**	0	ok	
Method Blank	**60.03**			ok
VA0062685-001-FB-06232014	**234.709**			ok

Wet 2

	Effluent sample #1
Sample_ID	VA0062685-001-WW-07252014
Lab_Sample_ID	6413002
Lab_Name	Cape Fear
Sample_Matrix	Water (whole)
Percent_Mositure	0
Percent_Lipid	
QC_Code	SA
Sample_Date	7/25/2014
Sample_Time	19:00
Analysis_Performed	EPA Method 1668A
Extraction_Date	7/31/2014
Analysis_Date	8/5/2014
Analysis_Time	13:37
Sample_Size	2248

Summary	Uncensored tPCB unadj (pg/L)	** Censored ** Compared to largest blnk (X5) & corrected tPCB adj (pg/L)	OPR (ok)	Extraction, Cleanup & Injection stds (ok)
VA0062685-001-WW-07252014	**494.385**	409.189		ok
Eff 2	**0**	0		
Eff 3	**0**	0		
Eff 4	**0**	0		
Eff 5	**0**	0	ok	
Method Blank	**37.72**			ok
VA0062685-001-FB-07242014	**59.191**			ok

APPENDIX D

WATER QUALITY BASED LIMITATIONS ANAYSES

9.0 MGD Design Flow

Mixing Zone Predictions
annual
wet season

WQC/WLA Spreadsheet

STATS printouts for reasonable potential analyses
Ammonia (yearly and high flow)
Cadmium
Chromium
Copper
Nickel
Zinc
tPCBs

18.0 MGD Design Flow

Mixing Zone Predictions
annual
wet season

STATS printouts for WQC/WLA Spreadsheet input data
upstream expected values (EV)
97th effluent percentiles

WQC/WLA Spreadsheet

STATS printouts for reasonable potential analyses
Ammonia (annual and wet season)
Cadmium
Chromium
Copper
Nickel
Zinc
tPCBs

9.0 MGD DESIGN FLOW

Mixing Zone Predictions for Pepper's Ferry RWTA (annual)

Effluent Flow = 9.0 MGD
Stream 7Q10 = 546 MGD
Stream 30Q10 = 633 MGD
Stream 1Q10 = 436 MGD
Stream slope = 0.00093 ft/ft
Stream width = 475 ft
Bottom scale = 4
Channel scale = 1

Mixing Zone Predictions @ 7Q10

Depth = 2.8164 ft
Length = 70864.1 ft
Velocity = .6422 ft/sec
Residence Time = 1.2771 days

Recommendation:

A complete mix assumption is appropriate for this situation and the entire 7Q10 may be used.

Mixing Zone Predictions @ 30Q10

Depth = 3.0748 ft
Length = 65816.89 ft
Velocity = .6804 ft/sec
Residence Time = 1.1195 days

Recommendation:

A complete mix assumption is appropriate for this situation and the entire 30Q10 may be used.

Mixing Zone Predictions @ 1Q10

Depth = 2.4653 ft
Length = 79254.8 ft
Velocity = .5882 ft/sec
Residence Time = 37.4252 hours

Recommendation:

A complete mix assumption is appropriate for this situation providing no more than 2.67% of the 1Q10 is used.

Mixing Zone Predictions for Pepper's Ferry RWTA (wet season)

Effluent Flow = 9.0 MGD
Stream 7Q10 = 758 MGD
Stream 30Q10 = 1053 MGD
Stream 1Q10 = 515 MGD
Stream slope = 0.00093 ft/ft
Stream width = 475 ft
Bottom scale = 4
Channel scale = 1

Mixing Zone Predictions @ 7Q10

Depth = 3.4231 ft
Length = 60128.6 ft
Velocity = .7302 ft/sec
Residence Time = .9531 days

Recommendation:

A complete mix assumption is appropriate for this situation and the entire 7Q10 may be used.

Mixing Zone Predictions @ 30Q10

Depth = 4.1664 ft
Length = 50941.97 ft
Velocity = .8307 ft/sec
Residence Time = .7098 days

Recommendation:

A complete mix assumption is appropriate for this situation and the entire 30Q10 may be used.

Mixing Zone Predictions @ 1Q10

Depth = 2.7205 ft
Length = 72959.09 ft
Velocity = .6277 ft/sec
Residence Time = 32.2859 hours

Recommendation:

A complete mix assumption is appropriate for this situation providing no more than 3.1% of the 1Q10 is used.

FRESHWATER
WATER QUALITY CRITERIA / WASTELOAD ALLOCATION ANALYSIS

Facility Name: Pepper's Ferry Regional Wastewater Treatment Authority Permit No.: VA0062685

Receiving Stream: New River

Version: OWP Guidance Memo 00-2011 (8/24/00)

Stream Information

Mean Hardness (as CaCO3) =	78.7	mg/L
90% Temperature (Annual) =	22.9	deg C
90% Temperature (Wet season) =	16.6	deg C
90% Maximum pH =	8.3	SU
10% Maximum pH =	7.3	SU
Tier Designation (1 or 2) =	2	
Public Water Supply (PWS) Y/N? =	Y	
Trout Present Y/N? =	N	
Early Life Stages Present Y/N? =	Y	

Stream Flows

1Q10 (Annual) =	436	MGD
7Q10 (Annual) =	546	MGD
30Q10 (Annual) =	633	MGD
1Q10 (Wet season) =	515	MGD
30Q10 (Wet season)	1053	MGD
30Q5 =	712	MGD
Harmonic Mean =	1506	MGD

Mixing Information

Annual - 1Q10 Mix =	2.67	%
- 7Q10 Mix =	100	%
- 30Q10 Mix =	100	%
Wet Season - 1Q10 Mix =	3.1	%
- 30Q10 Mix =	100	%

Effluent Information

Mean Hardness (as CaCO3) =	223	mg/L
90% Temp (Annual) =	23	deg C
90% Temp (Wet season) =	18	deg C
90% Maximum pH =	7.3	SU
10% Maximum pH =	6.9	SU
Discharge Flow =	9	MGD

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				**Most Limiting Allocations**			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	**Acute**	**Chronic**	**HH (PWS)**	**HH**
Acenapthene	0	--	--	6.7E+02	9.9E+02	--	--	5.4E+04	7.9E+04	--	--	6.7E+01	9.9E+01	--	--	5.4E+03	7.9E+03	**--**	**--**	**5.4E+03**	**7.9E+03**
Acrolein	0	--	--	6.1E+00	9.3E+00	--	--	4.9E+02	7.5E+02	--	--	6.1E-01	9.3E-01	--	--	4.9E+01	7.5E+01	**--**	**--**	**4.9E+01**	**7.5E+01**
Acrylonitrile[c]	0	--	--	5.1E-01	2.5E+00	--	--	8.6E+01	4.2E+02	--	--	5.1E-02	2.5E-01	--	--	8.6E+00	4.2E+01	**--**	**--**	**8.6E+00**	**4.2E+01**
Aldrin [c]	0	3.0E+00	--	4.9E-04	5.0E-04	6.9E+00	--	8.2E-02	8.4E-02	7.5E-01	--	4.9E-05	5.0E-05	3.7E+01	--	8.2E-03	8.4E-03	**6.9E+00**	**--**	**8.2E-03**	**8.4E-03**
Ammonia-N (mg/l) (Yearly)	0.01	1.68E+01	9.66E-01	--	--	3.86E+01	6.82E+01	--	--	1.37E+00	2.49E-01	--	--	6.70E+01	1.71E+01	--	--	**3.86E+01**	**1.71E+01**	**--**	**--**
Ammonia-N (mg/l) (High Flow)	0.01	1.51E+01	1.40E+00	--	--	4.20E+01	1.64E+02	--	--	1.34E+00	3.58E-01	--	--	7.74E+01	4.11E+01	--	--	**4.20E+01**	**4.11E+01**	**--**	**--**
Anthracene	0	--	--	8.3E+03	4.0E+04	--	--	6.6E+05	3.2E+06	--	--	8.3E+02	4.0E+03	--	--	6.6E+04	3.2E+05	**--**	**--**	**6.6E+04**	**3.2E+05**
Antimony	0	--	--	5.6E+00	6.4E+02	--	--	4.5E+02	5.1E+04	--	--	5.6E-01	6.4E+01	--	--	4.5E+01	5.1E+03	**--**	**--**	**4.5E+01**	**5.1E+03**
Arsenic	0.35	3.4E+02	1.5E+02	1.0E+01	--	7.8E+02	9.2E+03	7.7E+02	--	8.5E+01	3.8E+01	1.3E+00	--	4.2E+03	2.3E+03	7.8E+01	--	**7.8E+02**	**2.3E+03**	**7.8E+01**	**--**
Barium	0	--	--	2.0E+03	--	--	--	1.6E+05	--	--	--	2.0E+02	--	--	--	1.6E+04	--	**--**	**--**	**1.6E+04**	**--**
Benzene [c]	0	--	--	2.2E+01	5.1E+02	--	--	3.7E+03	8.6E+04	--	--	2.2E+00	5.1E+01	--	--	3.7E+02	8.6E+03	**--**	**--**	**3.7E+02**	**8.6E+03**
Benzidine[c]	0	--	--	8.6E-04	2.0E-03	--	--	1.4E-01	3.4E-01	--	--	8.6E-05	2.0E-04	--	--	1.4E-02	3.4E-02	**--**	**--**	**1.4E-02**	**3.4E-02**
Benzo (a) anthracene [c]	0	--	--	3.8E-02	1.8E-01	--	--	6.4E+00	3.0E+01	--	--	3.8E-03	1.8E-02	--	--	6.4E-01	3.0E+00	**--**	**--**	**6.4E-01**	**3.0E+00**
Benzo (b) fluoranthene [c]	0	--	--	3.8E-02	1.8E-01	--	--	6.4E+00	3.0E+01	--	--	3.8E-03	1.8E-02	--	--	6.4E-01	3.0E+00	**--**	**--**	**6.4E-01**	**3.0E+00**
Benzo (k) fluoranthene [c]	0	--	--	3.8E-02	1.8E-01	--	--	6.4E+00	3.0E+01	--	--	3.8E-03	1.8E-02	--	--	6.4E-01	3.0E+00	**--**	**--**	**6.4E-01**	**3.0E+00**
Benzo (a) pyrene [c]	0	--	--	3.8E-02	1.8E-01	--	--	6.4E+00	3.0E+01	--	--	3.8E-03	1.8E-02	--	--	6.4E-01	3.0E+00	**--**	**--**	**6.4E-01**	**3.0E+00**
Bis2-Chloroethyl Ether [c]	0	--	--	3.0E-01	5.3E+00	--	--	5.1E+01	8.9E+02	--	--	3.0E-02	5.3E-01	--	--	5.1E+00	8.9E+01	**--**	**--**	**5.1E+00**	**8.9E+01**
Bis2-Chloroisopropyl Ether	0	--	--	1.4E+03	6.5E+04	--	--	1.1E+05	5.2E+06	--	--	1.4E+02	6.5E+03	--	--	1.1E+04	5.2E+05	**--**	**--**	**1.1E+04**	**5.2E+05**
Bis 2-Ethylhexyl Phthalate [c]	0	--	--	1.2E+01	2.2E+01	--	--	2.0E+03	3.7E+03	--	--	1.2E+00	2.2E+00	--	--	2.0E+02	3.7E+02	**--**	**--**	**2.0E+02**	**3.7E+02**
Bromoform [c]	0	--	--	4.3E+01	1.4E+03	--	--	7.2E+03	2.4E+05	--	--	4.3E+00	1.4E+02	--	--	7.2E+02	2.4E+04	**--**	**--**	**7.2E+02**	**2.4E+04**
Butylbenzylphthalate	0	--	--	1.5E+03	1.9E+03	--	--	1.2E+05	1.5E+05	--	--	1.5E+02	1.9E+02	--	--	1.2E+04	1.5E+04	**--**	**--**	**1.2E+04**	**1.5E+04**
Cadmium	0	5.8E+00	9.6E-01	5.0E+00	--	1.3E+01	5.9E+01	4.0E+02	--	7.8E-01	2.4E-01	5.0E-01	--	3.9E+01	1.5E+01	4.0E+01	--	**1.3E+01**	**1.5E+01**	**4.0E+01**	**--**
Carbon Tetrachloride [c]	0	--	--	2.3E+00	1.6E+01	--	--	3.9E+02	2.7E+03	--	--	2.3E-01	1.6E+00	--	--	3.9E+01	2.7E+02	**--**	**--**	**3.9E+01**	**2.7E+02**
Chlordane [c]	0	2.4E+00	4.3E-03	8.0E-03	8.1E-03	5.5E+00	2.7E-01	1.3E+00	1.4E+00	6.0E-01	1.1E-03	8.0E-04	8.1E-04	3.0E+01	6.6E-02	1.3E-01	1.4E-01	**5.5E+00**	**6.6E-02**	**1.3E-01**	**1.4E-01**
Chloride	9120	8.6E+05	2.3E+05	2.5E+05	--	2.0E+06	1.4E+07	1.9E+07	--	2.2E+05	6.4E+04	3.3E+04	--	1.1E+07	3.4E+06	1.9E+06	--	**2.0E+06**	**3.4E+06**	**1.9E+06**	**--**
TRC	0	1.9E+01	1.1E+01	--	--	4.4E+01	6.8E+02	--	--	4.8E+00	2.8E+00	--	--	2.3E+02	1.7E+02	--	--	**4.4E+01**	**1.7E+02**	**--**	**--**
Chlorobenzene	0	--	--	1.3E+02	1.6E+03	--	--	1.0E+04	1.3E+05	--	--	1.3E+01	1.6E+02	--	--	1.0E+03	1.3E+04	**--**	**--**	**1.0E+03**	**1.3E+04**

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Chlorodibromomethane[c]	0	--	--	4.0E+00	1.3E+02	--	--	6.7E+02	2.2E+04	--	--	4.0E-01	1.3E+01	--	--	6.7E+01	2.2E+03	--	--	6.7E+01	2.2E+03
Chloroform	0	--	--	3.4E+02	1.1E+04	--	--	2.7E+04	8.8E+05	--	--	3.4E+01	1.1E+03	--	--	2.7E+03	8.8E+04	--	--	2.7E+03	8.8E+04
2-Chloronaphthalene	0	--	--	1.0E+03	1.6E+03	--	--	8.0E+04	1.3E+05	--	--	1.0E+02	1.6E+02	--	--	8.0E+03	1.3E+04	--	--	8.0E+03	1.3E+04
2-Chlorophenol	0	--	--	8.1E+01	1.5E+02	--	--	6.5E+03	1.2E+04	--	--	8.1E+00	1.5E+01	--	--	6.5E+02	1.2E+03	--	--	6.5E+02	1.2E+03
Chlorpyrifos	0	8.3E-02	4.1E-02	--	--	1.9E-01	2.5E+00	--	--	2.1E-02	1.0E-02	--	--	1.0E+00	6.3E-01	--	--	1.9E-01	6.3E-01	--	--
Chromium III	0	7.6E+02	6.2E+01	--	--	1.7E+03	3.8E+03	--	--	1.2E+02	1.6E+01	--	--	6.0E+03	9.6E+02	--	--	1.7E+03	9.6E+02	--	--
Chromium VI	0	1.6E+01	1.1E+01	--	--	3.7E+01	6.8E+02	--	--	4.0E+00	2.8E+00	--	--	2.0E+02	1.7E+02	--	--	3.7E+01	1.7E+02	--	--
Chromium, Total	0.18	--	--	1.0E+02	--	--	--	8.0E+03	--	--	--	1.0E+01	--	--	--	8.0E+02	--	--	--	8.0E+02	--
Chrysene [c]	0	--	--	3.8E-03	1.8E-02	--	--	6.4E-01	3.0E+00	--	--	3.8E-04	1.8E-03	--	--	6.4E-02	3.0E-01	--	--	6.4E-02	3.0E-01
Copper	0.65	1.9E+01	7.5E+00	1.3E+03	--	4.2E+01	4.2E+02	1.0E+05	--	3.3E+00	2.4E+00	1.3E+02	--	1.3E+02	1.1E+02	1.0E+04	--	4.2E+01	1.1E+02	1.0E+04	--
Cyanide, Free	0	2.2E+01	5.2E+00	1.4E+02	1.6E+04	5.0E+01	3.2E+02	1.1E+04	1.3E+06	5.5E+00	1.3E+00	1.4E+01	1.6E+03	2.7E+02	8.0E+01	1.1E+03	1.3E+05	5.0E+01	8.0E+01	1.1E+03	1.3E+05
DDD [c]	0	--	--	3.1E-03	3.1E-03	--	--	5.2E-01	5.2E-01	--	--	3.1E-04	3.1E-04	--	--	5.2E-02	5.2E-02	--	--	5.2E-02	5.2E-02
DDE [c]	0	--	--	2.2E-03	2.2E-03	--	--	3.7E-01	3.7E-01	--	--	2.2E-04	2.2E-04	--	--	3.7E-02	3.7E-02	--	--	3.7E-02	3.7E-02
DDT [c]	0	1.1E+00	1.0E-03	2.2E-03	2.2E-03	2.5E+00	6.2E-02	3.7E-01	3.7E-01	2.8E-01	2.5E-04	2.2E-04	2.2E-04	1.4E+01	1.5E-02	3.7E-02	3.7E-02	2.5E+00	1.5E-02	3.7E-02	3.7E-02
Demeton	0	--	1.0E-01	--	--	--	6.2E+00	--	--	--	2.5E-02	--	--	--	1.5E+00	--	--	--	1.5E+00	--	--
Diazinon	0	1.7E-01	1.7E-01	--	--	3.9E-01	1.0E+01	--	--	4.3E-02	4.3E-02	--	--	2.1E+00	2.6E+00	--	--	3.9E-01	2.6E+00	--	--
Dibenz(a,h)anthracene [c]	0	--	--	3.8E-02	1.8E-01	--	--	6.4E+00	3.0E+01	--	--	3.8E-03	1.8E-02	--	--	6.4E-01	3.0E+00	--	--	6.4E-01	3.0E+00
1,2-Dichlorobenzene	0	--	--	4.2E+02	1.3E+03	--	--	3.4E+04	1.0E+05	--	--	4.2E+01	1.3E+02	--	--	3.4E+03	1.0E+04	--	--	3.4E+03	1.0E+04
1,3-Dichlorobenzene	0	--	--	3.2E+02	9.6E+02	--	--	2.6E+04	7.7E+04	--	--	3.2E+01	9.6E+01	--	--	2.6E+03	7.7E+03	--	--	2.6E+03	7.7E+03
1,4-Dichlorobenzene	0	--	--	6.3E+01	1.9E+02	--	--	5.0E+03	1.5E+04	--	--	6.3E+00	1.9E+01	--	--	5.0E+02	1.5E+03	--	--	5.0E+02	1.5E+03
3,3-Dichlorobenzidine[c]	0	--	--	2.1E-01	2.8E-01	--	--	3.5E+01	4.7E+01	--	--	2.1E-02	2.8E-02	--	--	3.5E+00	4.7E+00	--	--	3.5E+00	4.7E+00
Dichlorobromomethane [c]	0	--	--	5.5E+00	1.7E+02	--	--	9.3E+02	2.9E+04	--	--	5.5E-01	1.7E+01	--	--	9.3E+01	2.9E+03	--	--	9.3E+01	2.9E+03
1,2-Dichloroethane [c]	0	--	--	3.8E+00	3.7E+02	--	--	6.4E+02	6.2E+04	--	--	3.8E-01	3.7E+01	--	--	6.4E+01	6.2E+03	--	--	6.4E+01	6.2E+03
1,1-Dichloroethylene	0	--	--	3.3E+02	7.1E+03	--	--	2.6E+04	5.7E+05	--	--	3.3E+01	7.1E+02	--	--	2.6E+03	5.7E+04	--	--	2.6E+03	5.7E+04
1,2-trans-dichloroethylene	0	--	--	1.4E+02	1.0E+04	--	--	1.1E+04	8.0E+05	--	--	1.4E+01	1.0E+03	--	--	1.1E+03	8.0E+04	--	--	1.1E+03	8.0E+04
2,4-Dichlorophenol	0	--	--	7.7E+01	2.9E+02	--	--	6.2E+03	2.3E+04	--	--	7.7E+00	2.9E+01	--	--	6.2E+02	2.3E+03	--	--	6.2E+02	2.3E+03
2,4-Dichlorophenoxy acetic acid (2,4-D)	0	--	--	1.0E+02	--	--	--	8.0E+03	--	--	--	1.0E+01	--	--	--	8.0E+02	--	--	--	8.0E+02	--
1,2-Dichloropropane[c]	0	--	--	5.0E+00	1.5E+02	--	--	8.4E+02	2.5E+04	--	--	5.0E-01	1.5E+01	--	--	8.4E+01	2.5E+03	--	--	8.4E+01	2.5E+03
1,3-Dichloropropene [c]	0	--	--	3.4E+00	2.1E+02	--	--	5.7E+02	3.5E+04	--	--	3.4E-01	2.1E+01	--	--	5.7E+01	3.5E+03	--	--	5.7E+01	3.5E+03
Dieldrin [c]	0	2.4E-01	5.6E-02	5.2E-04	5.4E-04	5.5E-01	3.5E+00	8.8E-02	9.1E-02	6.0E-02	1.4E-02	5.2E-05	5.4E-05	3.0E+00	8.6E-01	8.8E-03	9.1E-03	5.5E-01	8.6E-01	8.8E-03	9.1E-03
Diethyl Phthalate	0	--	--	1.7E+04	4.4E+04	--	--	1.4E+06	3.5E+06	--	--	1.7E+03	4.4E+03	--	--	1.4E+05	3.5E+05	--	--	1.4E+05	3.5E+05
2,4-Dimethylphenol	0	--	--	3.8E+02	8.5E+02	--	--	3.0E+04	6.8E+04	--	--	3.8E+01	8.5E+01	--	--	3.0E+03	6.8E+03	--	--	3.0E+03	6.8E+03
Dimethyl Phthalate	0	--	--	2.7E+05	1.1E+06	--	--	2.2E+07	8.8E+07	--	--	2.7E+04	1.1E+05	--	--	2.2E+06	8.8E+06	--	--	2.2E+06	8.8E+06
Di-n-Butyl Phthalate	0	--	--	2.0E+03	4.5E+03	--	--	1.6E+05	3.6E+05	--	--	2.0E+02	4.5E+02	--	--	1.6E+04	3.6E+04	--	--	1.6E+04	3.6E+04
2,4 Dinitrophenol	0	--	--	6.9E+01	5.3E+03	--	--	5.5E+03	4.2E+05	--	--	6.9E+00	5.3E+02	--	--	5.5E+02	4.2E+04	--	--	5.5E+02	4.2E+04
2-Methyl-4,6-Dinitrophenol	0	--	--	1.3E+01	2.8E+02	--	--	1.0E+03	2.2E+04	--	--	1.3E+00	2.8E+01	--	--	1.0E+02	2.2E+03	--	--	1.0E+02	2.2E+03
2,4-Dinitrotoluene [c]	0	--	--	1.1E+00	3.4E+01	--	--	1.9E+02	5.7E+03	--	--	1.1E-01	3.4E+00	--	--	1.9E+01	5.7E+02	--	--	1.9E+01	5.7E+02
Dioxin 2,3,7,8-tetrachlorodibenzo-p-dioxin	0	--	--	5.0E-08	5.1E-08	--	--	4.0E-06	4.1E-06	--	--	5.0E-09	5.1E-09	--	--	4.0E-07	4.1E-07	--	--	4.0E-07	4.1E-07
1,2-Diphenylhydrazine[c]	0	--	--	3.6E-01	2.0E+00	--	--	6.1E+01	3.4E+02	--	--	3.6E-02	2.0E-01	--	--	6.1E+00	3.4E+01	--	--	6.1E+00	3.4E+01
Alpha-Endosulfan	0	2.2E-01	5.6E-02	6.2E+01	8.9E+01	5.0E-01	3.5E+00	5.0E+03	7.1E+03	5.5E-02	1.4E-02	6.2E+00	8.9E+00	2.7E+00	8.6E-01	5.0E+02	7.1E+02	5.0E-01	8.6E-01	5.0E+02	7.1E+02
Beta-Endosulfan	0	2.2E-01	5.6E-02	6.2E+01	8.9E+01	5.0E-01	3.5E+00	5.0E+03	7.1E+03	5.5E-02	1.4E-02	6.2E+00	8.9E+00	2.7E+00	8.6E-01	5.0E+02	7.1E+02	5.0E-01	8.6E-01	5.0E+02	7.1E+02
Alpha + Beta Endosulfan	0	2.2E-01	5.6E-02	--	--	5.0E-01	3.5E+00	--	--	5.5E-02	1.4E-02	--	--	2.7E+00	8.6E-01	--	--	5.0E-01	8.6E-01	--	--
Endosulfan Sulfate	0	--	--	6.2E+01	8.9E+01	--	--	5.0E+03	7.1E+03	--	--	6.2E+00	8.9E+00	--	--	5.0E+02	7.1E+02	--	--	5.0E+02	7.1E+02
Endrin	0	8.6E-02	3.6E-02	5.9E-02	6.0E-02	2.0E-01	2.2E+00	4.7E+00	4.8E+00	2.2E-02	9.0E-03	5.9E-03	6.0E-03	1.1E+00	5.6E-01	4.7E-01	4.8E-01	2.0E-01	5.6E-01	4.7E-01	4.8E-01
Endrin Aldehyde	0	--	--	2.9E-01	3.0E-01	--	--	2.3E+01	2.4E+01	--	--	2.9E-02	3.0E-02	--	--	2.3E+00	2.4E+00	--	--	2.3E+00	2.4E+00

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Ethylbenzene	0	--	--	5.3E+02	2.1E+03	--	--	4.2E+04	1.7E+05	--	--	5.3E+01	2.1E+02	--	--	4.2E+03	1.7E+04	--	--	4.2E+03	1.7E+04
Fluoranthene	0	--	--	1.3E+02	1.4E+02	--	--	1.0E+04	1.1E+04	--	--	1.3E+01	1.4E+01	--	--	1.0E+03	1.1E+03	--	--	1.0E+03	1.1E+03
Fluorene	0	--	--	1.1E+03	5.3E+03	--	--	8.8E+04	4.2E+05	--	--	1.1E+02	5.3E+02	--	--	8.8E+03	4.2E+04	--	--	8.8E+03	4.2E+04
Foaming Agents	0	--	--	5.0E+02	--	--	--	4.0E+04	--	--	--	5.0E+01	--	--	--	4.0E+03	--	--	--	4.0E+03	--
Guthion	0	--	1.0E-02	--	--	--	6.2E-01	--	--	--	2.5E-03	--	--	--	1.5E-01	--	--	--	1.5E-01	--	--
Heptachlor [C]	0	5.2E-01	3.8E-03	7.9E-04	7.9E-04	1.2E+00	2.3E-01	1.3E-01	1.3E-01	1.3E-01	9.5E-04	7.9E-05	7.9E-05	6.4E+00	5.9E-02	1.3E-02	1.3E-02	1.2E+00	5.9E-02	1.3E-02	1.3E-02
Heptachlor Epoxide[C]	0	5.2E-01	3.8E-03	3.9E-04	3.9E-04	1.2E+00	2.3E-01	6.6E-02	6.6E-02	1.3E-01	9.5E-04	3.9E-05	3.9E-05	6.4E+00	5.9E-02	6.6E-03	6.6E-03	1.2E+00	5.9E-02	6.6E-03	6.6E-03
Hexachlorobenzene[C]	0	--	--	2.8E-03	2.9E-03	--	--	4.7E-01	4.9E-01	--	--	2.8E-04	2.9E-04	--	--	4.7E-02	4.9E-02	--	--	4.7E-02	4.9E-02
Hexachlorobutadiene[C]	0	--	--	4.4E+00	1.8E+02	--	--	7.4E+02	3.0E+04	--	--	4.4E-01	1.8E+01	--	--	7.4E+01	3.0E+03	--	--	7.4E+01	3.0E+03
Hexachlorocyclohexane Alpha-BHC[C]	0	--	--	2.6E-02	4.9E-02	--	--	4.4E+00	8.2E+00	--	--	2.6E-03	4.9E-03	--	--	4.4E-01	8.2E-01	--	--	4.4E-01	8.2E-01
Hexachlorocyclohexane Beta-BHC[C]	0	--	--	9.1E-02	1.7E-01	--	--	1.5E+01	2.9E+01	--	--	9.1E-03	1.7E-02	--	--	1.5E+00	2.9E+00	--	--	1.5E+00	2.9E+00
Hexachlorocyclohexane Gamma-BHC[C] (Lindane)	0	9.5E-01	--	9.8E-01	1.8E+00	2.2E+00	--	1.6E+02	3.0E+02	2.4E-01	--	9.8E-02	1.8E-01	1.2E+01	--	1.6E+01	3.0E+01	2.2E+00	--	1.6E+01	3.0E+01
Hexachlorocyclopentadiene	0	--	--	4.0E+01	1.1E+03	--	--	3.2E+03	8.8E+04	--	--	4.0E+00	1.1E+02	--	--	3.2E+02	8.8E+03	--	--	3.2E+02	8.8E+03
Hexachloroethane[C]	0	--	--	1.4E+01	3.3E+01	--	--	2.4E+03	5.6E+03	--	--	1.4E+00	3.3E+00	--	--	2.4E+02	5.6E+02	--	--	2.4E+02	5.6E+02
Hydrogen Sulfide	0	--	2.0E+00	--	--	--	1.2E+02	--	--	--	5.0E-01	--	--	--	3.1E+01	--	--	--	3.1E+01	--	--
Indeno (1,2,3-cd) pyrene [C]	0	--	--	3.8E-02	1.8E-01	--	--	6.4E+00	3.0E+01	--	--	3.8E-03	1.8E-02	--	--	6.4E-01	3.0E+00	--	--	6.4E-01	3.0E+00
Iron	0	--	--	3.0E+02	--	--	--	2.4E+04	--	--	--	3.0E+01	--	--	--	2.4E+03	--	--	--	2.4E+03	--
Isophorone[C]	0	--	--	3.5E+02	9.6E+03	--	--	5.9E+04	1.6E+06	--	--	3.5E+01	9.6E+02	--	--	5.9E+03	1.6E+05	--	--	5.9E+03	1.6E+05
Kepone	0	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--	--
Lead	0	1.9E+02	1.0E+01	1.5E+01	--	4.2E+02	6.4E+02	1.2E+03	--	2.3E+01	2.6E+00	1.5E+00	--	1.1E+03	1.6E+02	1.2E+02	--	4.2E+02	1.6E+02	1.2E+02	--
Malathion	0	--	1.0E-01	--	--	--	6.2E+00	--	--	--	2.5E-02	--	--	--	1.5E+00	--	--	--	1.5E+00	--	--
Manganese	14.32	--	--	5.0E+01	--	--	--	2.9E+03	--	--	--	1.8E+01	--	--	--	3.0E+02	--	--	--	3.0E+02	--
Mercury	0	1.4E+00	7.7E-01	- -	- -	3.2E+00	4.7E+01	- -	- -	3.5E-01	1.9E-01	- -	--	1.7E+01	1.2E+01	- -	--	3.2E+00	1.2E+01	- -	- -
Methyl Bromide	0	--	--	4.7E+01	1.5E+03	--	--	3.8E+03	1.2E+05	--	--	4.7E+00	1.5E+02	--	--	3.8E+02	1.2E+04	--	--	3.8E+02	1.2E+04
Methylene Chloride [C]	0	--	--	4.6E+01	5.9E+03	--	--	7.7E+03	9.9E+05	--	--	4.6E+00	5.9E+02	--	--	7.7E+02	9.9E+04	--	--	7.7E+02	9.9E+04
Methoxychlor	0	--	3.0E-02	1.0E+02	--	--	1.9E+00	8.0E+03	--	--	7.5E-03	1.0E+01	--	--	4.6E-01	8.0E+02	--	--	4.6E-01	8.0E+02	--
Mirex	0	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--	--
Nickel	0.39	2.4E+02	1.7E+01	6.1E+02	4.6E+03	5.6E+02	1.0E+03	4.9E+04	3.7E+05	3.9E+01	4.5E+00	6.1E+01	4.6E+02	1.9E+03	2.6E+02	4.9E+03	3.7E+04	5.6E+02	2.6E+02	4.9E+03	3.7E+04
Nitrate (as N)	940	--	--	1.0E+04	--	--	--	7.3E+05	--	--	--	1.8E+03	--	--	--	7.4E+04	--	--	--	7.4E+04	--
Nitrobenzene	0	--	--	1.7E+01	6.9E+02	--	--	1.4E+03	5.5E+04	--	--	1.7E+00	6.9E+01	--	--	1.4E+02	5.5E+03	--	--	1.4E+02	5.5E+03
N-Nitrosodimethylamine[C]	0	--	--	6.9E-03	3.0E+01	--	--	1.2E+00	5.1E+03	--	--	6.9E-04	3.0E+00	--	--	1.2E-01	5.1E+02	--	--	1.2E-01	5.1E+02
N-Nitrosodiphenylamine[C]	0	--	--	3.3E+01	6.0E+01	--	--	5.6E+03	1.0E+04	--	--	3.3E+00	6.0E+00	--	--	5.6E+02	1.0E+03	--	--	5.6E+02	1.0E+03
N-Nitrosodi-n-propylamine[C]	0	--	--	5.0E-02	5.1E+00	--	--	8.4E+00	8.6E+02	--	--	5.0E-03	5.1E-01	--	--	8.4E-01	8.6E+01	--	--	8.4E-01	8.6E+01
Nonylphenol	0	2.8E+01	6.6E+00	--	--	6.4E+01	4.1E+02	--	--	7.0E+00	1.7E+00	--	--	3.5E+02	1.0E+02	--	--	6.4E+01	1.0E+02	--	--
Parathion	0	6.5E-02	1.3E-02	--	--	1.5E-01	8.0E-01	--	--	1.6E-02	3.3E-03	--	--	8.0E-01	2.0E-01	--	--	1.5E-01	2.0E-01	--	--
PCB Total[C]	0	--	1.4E-02	6.4E-04	6.4E-04	--	8.6E-01	1.1E-01	1.1E-01	--	3.5E-03	6.4E-05	6.4E-05	--	2.2E-01	1.1E-02	1.1E-02	--	2.2E-01	1.1E-02	1.1E-02
Pentachlorophenol [C]	0	9.5E+00	9.0E+00	2.7E+00	3.0E+01	2.2E+01	5.5E+02	4.5E+02	5.1E+03	2.9E+00	2.2E+00	2.7E-01	3.0E+00	1.4E+02	1.4E+02	4.5E+01	5.1E+02	2.2E+01	1.4E+02	4.5E+01	5.1E+02
Phenol	0	--	--	1.0E+04	8.6E+05	--	--	8.0E+05	6.9E+07	--	--	1.0E+03	8.6E+04	--	--	8.0E+04	6.9E+06	--	--	8.0E+04	6.9E+06
Pyrene	0	--	--	8.3E+02	4.0E+03	--	--	6.6E+04	3.2E+05	--	--	8.3E+01	4.0E+02	--	--	6.6E+03	3.2E+04	--	--	6.6E+03	3.2E+04
Radionuclides	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Gross Alpha Activity (pCi/L)	0	--	--	1.5E+01	--	--	--	1.2E+03	--	--	--	1.5E+00	--	--	--	1.2E+02	--	--	--	1.2E+02	--
Beta and Photon Activity (mrem/yr)	0	--	--	4.0E+00	--	--	--	3.2E+02	--	--	--	4.0E-01	--	--	--	3.2E+01	--	--	--	3.2E+01	--
Radium 226 + 228 (pCi/L)	0	--	--	5.0E+00	--	--	--	4.0E+02	--	--	--	5.0E-01	--	--	--	4.0E+01	--	--	--	4.0E+01	--
Uranium (ug/l)	0	--	--	3.0E+01	--	--	--	2.4E+03	--	--	--	3.0E+00	--	--	--	2.4E+02	--	--	--	2.4E+02	--

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				**Most Limiting Allocations**			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	**Acute**	**Chronic**	**HH (PWS)**	**HH**
Selenium, Total Recoverable	0	2.0E+01	5.0E+00	1.7E+02	4.2E+03	4.6E+01	3.1E+02	1.4E+04	3.4E+05	5.0E+00	1.3E+00	1.7E+01	4.2E+02	2.5E+02	7.7E+01	1.4E+03	3.4E+04	**4.6E+01**	**7.7E+01**	**1.4E+03**	**3.4E+04**
Silver	0	6.3E+00	--	--	--	1.4E+01	--	--	--	6.1E-01	--	--	--	3.0E+01	--	--	--	**1.4E+01**	**--**	**--**	**--**
Sulfate	8690	--	--	2.5E+05	--	--	--	1.9E+07	--	--	--	3.3E+04	--	--	--	1.9E+06	--	**--**	**--**	**1.9E+06**	**--**
1,1,2,2-Tetrachloroethane[C]	0	--	--	1.7E+00	4.0E+01	--	--	2.9E+02	6.7E+03	--	--	1.7E-01	4.0E+00	--	--	2.9E+01	6.7E+02	**--**	**--**	**2.9E+01**	**6.7E+02**
Tetrachloroethylene[C]	0	--	--	6.9E+00	3.3E+01	--	--	1.2E+03	5.6E+03	--	--	6.9E-01	3.3E+00	--	--	1.2E+02	5.6E+02	**--**	**--**	**1.2E+02**	**5.6E+02**
Thallium	0	--	--	2.4E-01	4.7E-01	--	--	1.9E+01	3.8E+01	--	--	2.4E-02	4.7E-02	--	--	1.9E+00	3.8E+00	**--**	**--**	**1.9E+00**	**3.8E+00**
Toluene	0	--	--	5.1E+02	6.0E+03	--	--	4.1E+04	4.8E+05	--	--	5.1E+01	6.0E+02	--	--	4.1E+03	4.8E+04	**--**	**--**	**4.1E+03**	**4.8E+04**
Total dissolved solids	0	--	--	5.0E+05	--	--	--	4.0E+07	--	--	--	5.0E+04	--	--	--	4.0E+06	--	**--**	**--**	**4.0E+06**	**--**
Toxaphene [C]	0	7.3E-01	2.0E-04	2.8E-03	2.8E-03	1.7E+00	1.2E-02	4.7E-01	4.7E-01	1.8E-01	5.0E-05	2.8E-04	2.8E-04	9.0E+00	3.1E-03	4.7E-02	4.7E-02	**1.7E+00**	**3.1E-03**	**4.7E-02**	**4.7E-02**
Tributyltin	0	4.6E-01	7.2E-02	--	--	1.1E+00	4.4E+00	--	--	1.2E-01	1.8E-02	--	--	5.7E+00	1.1E+00	--	--	**1.1E+00**	**1.1E+00**	**--**	**--**
1,2,4-Trichlorobenzene	0	--	--	3.5E+01	7.0E+01	--	--	2.8E+03	5.6E+03	--	--	3.5E+00	7.0E+00	--	--	2.8E+02	5.6E+02	**--**	**--**	**2.8E+02**	**5.6E+02**
1,1,2-Trichloroethane[C]	0	--	--	5.9E+00	1.6E+02	--	--	9.9E+02	2.7E+04	--	--	5.9E-01	1.6E+01	--	--	9.9E+01	2.7E+03	**--**	**--**	**9.9E+01**	**2.7E+03**
Trichloroethylene [C]	0	--	--	2.5E+01	3.0E+02	--	--	4.2E+03	5.1E+04	--	--	2.5E+00	3.0E+01	--	--	4.2E+02	5.1E+03	**--**	**--**	**4.2E+02**	**5.1E+03**
2,4,6-Trichlorophenol [C]	0	--	--	1.4E+01	2.4E+01	--	--	2.4E+03	4.0E+03	--	--	1.4E+00	2.4E+00	--	--	2.4E+02	4.0E+02	**--**	**--**	**2.4E+02**	**4.0E+02**
2-(2,4,5-Trichlorophenoxy) propionic acid (Silvex)	0	--	--	5.0E+01	--	--	--	4.0E+03	--	--	--	5.0E+00	--	--	--	4.0E+02	--	**--**	**--**	**4.0E+02**	**--**
Vinyl Chloride[C]	0	--	--	2.5E-01	2.4E+01	--	--	4.2E+01	4.0E+03	--	--	2.5E-02	2.4E+00	--	--	4.2E+00	4.0E+02	**--**	**--**	**4.2E+00**	**4.0E+02**
Zinc	3.68	1.6E+02	9.9E+01	7.4E+03	2.6E+04	3.6E+02	5.9E+03	5.9E+05	2.1E+06	2.7E+01	2.7E+01	7.4E+02	2.6E+03	1.2E+03	1.5E+03	5.9E+04	2.1E+05	**3.6E+02**	**1.5E+03**	**5.9E+04**	**2.1E+05**

Notes:

1. All concentrations expressed as micrograms/liter (ug/l), unless noted otherwise
2. Discharge flow is highest monthly average or Form 2C maximum for Industries and design flow for Municipals
3. Metals measured as Dissolved, unless specified otherwise
4. "C" indicates a carcinogenic parameter
5. Regular WLAs are mass balances (minus background concentration) using the % of stream flow entered above under Mixing Information.
   Antidegradation WLAs are based upon a complete mix.
6. Antideg. Baseline = (0.25(WQC - background conc.) + background conc.) for acute and chronic
   = (0.1(WQC - background conc.) + background conc.) for human health
7. WLAs established at the following stream flows: 1Q10 for Acute, 30Q10 for Chronic Ammonia, 7Q10 for Other Chronic, 30Q5 for Non-carcinogens and Harmonic Mean for Carcinogens. To apply mixing ratios from a model set the stream flow equal to (mixing ratio - 1), effluent flow equal to 1 and 100% mix.

Metal	Target Value (SSTV)
Antimony	4.5E+01
Arsenic	7.8E+01
Barium	1.6E+04
Cadmium	5.3E+00
Chromium III	5.8E+02
Chromium VI	1.5E+01
Copper	1.7E+01
Iron	2.4E+03
Lead	9.6E+01
Manganese	3.0E+02
Mercury	1.3E+00
Nickel	1.5E+02
Selenium	1.8E+01
Silver	5.8E+00
Zinc	1.4E+02

Note: do not use QL's lower than the minimum QL's provided in agency guidance

2/25/2014 4:04:31 PM

Facility = PFRWTA
Chemical = ammonia (yearly) in mg/L
Chronic averaging period = 30
WLAa = 38.6
WLAc = 68.2
Q.L. = 0.20
# samples/mo. = 30
# samples/wk. = 8

Summary of Statistics:

observations = 1
Expected Value = 9
Variance = 29.16
C.V. = 0.6
97th percentile daily values = 21.9007
97th percentile 4 day average = 14.9741
97th percentile 30 day average= 10.8544
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

No Limit is required for this material

The data are:

9

2/21/2014 9:13:24 AM

Facility = PFRWTA
Chemical = ammonia (high flow) in mg/L
Chronic averaging period = 30
WLAa = 42
WLAc = 164
Q.L. = 0.20
# samples/mo. = 30
# samples/wk. = 8

Summary of Statistics:

observations = 1
Expected Value = 9
Variance = 29.16
C.V. = 0.6
97th percentile daily values = 21.9007
97th percentile 4 day average = 14.9741
97th percentile 30 day average= 10.8544
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

No Limit is required for this material

The data are:

9

2/21/2014 9:20:22 AM

Facility = PFRWTA
Chemical = cadmium in ug/L
Chronic averaging period = 4
WLAa = 13
WLAc = 59
Q.L. = 0.2
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 3
Expected Value = .185549
Variance = .012394
C.V. = 0.6
97th percentile daily values = .451520
97th percentile 4 day average = .308715
97th percentile 30 day average= .223782
< Q.L. = 2
Model used = BPJ Assumptions, Type 1 data

No Limit is required for this material

The data are:

0
0
0.2

2/21/2014 10:46:09 AM

Facility = PFRWTA
Chemical = chromium in ug/L
Chronic averaging period = 4
WLAa = 37
WLAc = 680
Q.L. = 1.0
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 3
Expected Value = 14.1666
Variance = 72.25
C.V. = 0.6
97th percentile daily values = 34.4734
97th percentile 4 day average = 23.5703
97th percentile 30 day average= 17.0857
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

No Limit is required for this material

The data are:

7.8
26.7
8

2/21/2014 10:00:28 AM

Facility = PFRWTA
Chemical = copper in ug/L
Chronic averaging period = 4
WLAa = 42
WLAc = 420
Q.L. = 2.0
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 3
Expected Value = 5.2
Variance = 9.7344
C.V. = 0.6
97th percentile daily values = 12.6537
97th percentile 4 day average = 8.65170
97th percentile 30 day average= 6.27147
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

No Limit is required for this material

The data are:

5
5.3
5.3

2/21/2014 10:05:34 AM

Facility = PFRWTA
Chemical = nickel in ug/L
Chronic averaging period = 4
WLAa = 560
WLAc = 1000
Q.L. = 2.0
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 3
Expected Value = 5.56666
Variance = 11.1556
C.V. = 0.6
97th percentile daily values = 13.5460
97th percentile 4 day average = 9.26176
97th percentile 30 day average= 6.71369
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

No Limit is required for this material

The data are:

4.5
6.7
5.5

2/21/2014 10:11:53 AM

Facility = PFRWTA
Chemical = zinc in ug/L
Chronic averaging period = 4
WLAa = 360
WLAc = 5900
Q.L. = 3.0
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 3
Expected Value = 35
Variance = 441
C.V. = 0.6
97th percentile daily values = 85.1696
97th percentile 4 day average = 58.2326
97th percentile 30 day average= 42.2118
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

No Limit is required for this material

The data are:

29.5
34.9
40.6

FRESHWATER
WATER QUALITY CRITERIA / WASTELOAD ALLOCATION ANALYSIS

Facility Name: Pepper's Ferry Regional Wastewater Treatment Authority Permit No.: VA0062685

Receiving Stream: New River

Version: OWP Guidance Memo 00-2011 (8/24/00)

Stream Information		
Mean Hardness (as CaCO3) =	78.7	mg/L
90% Temperature (Annual) =	22.9	deg C
90% Temperature (Wet season) =	16.6	deg C
90% Maximum pH =	8.3	SU
10% Maximum pH =	7.3	SU
Tier Designation (1 or 2) =	2	
Public Water Supply (PWS) Y/N? =	Y	
Trout Present Y/N? =	N	
Early Life Stages Present Y/N? =	Y	

Stream Flows		
1Q10 (Annual) =	436	MGD
7Q10 (Annual) =	546	MGD
30Q10 (Annual) =	633	MGD
1Q10 (Wet season) =	515	MGD
30Q10 (Wet season)	1053	MGD
30Q5 =	712	MGD
Harmonic Mean =	1506	MGD

Mixing Information		
Annual - 1Q10 Mix =	2.67	%
- 7Q10 Mix =	100	%
- 30Q10 Mix =	100	%
Wet Season - 1Q10 Mix =	3.1	%
- 30Q10 Mix =	100	%

Effluent Information		
Mean Hardness (as CaCO3) =	223	mg/L
90% Temp (Annual) =	23	deg C
90% Temp (Wet season) =	18	deg C
90% Maximum pH =	7.3	SU
10% Maximum pH =	6.9	SU
Discharge Flow =	9	MGD

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				**Most Limiting Allocations**			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	**Acute**	**Chronic**	**HH (PWS)**	**HH**
Acenapthene	0	--	--	6.7E+02	9.9E+02	--	--	5.4E+04	7.9E+04	--	--	6.7E+01	9.9E+01	--	--	5.4E+03	7.9E+03	**--**	**--**	**5.4E+03**	**7.9E+03**
Acrolein	0	--	--	6.1E+00	9.3E+00	--	--	4.9E+02	7.5E+02	--	--	6.1E-01	9.3E-01	--	--	4.9E+01	7.5E+01	**--**	**--**	**4.9E+01**	**7.5E+01**
Acrylonitrile[C]	0	--	--	5.1E-01	2.5E+00	--	--	8.6E+01	4.2E+02	--	--	5.1E-02	2.5E-01	--	--	8.6E+00	4.2E+01	**--**	**--**	**8.6E+00**	**4.2E+01**
Aldrin [C]	0	3.0E+00	--	4.9E-04	5.0E-04	6.9E+00	--	8.2E-02	8.4E-02	7.5E-01	--	4.9E-05	5.0E-05	3.7E+01	--	8.2E-03	8.4E-03	**6.9E+00**	**--**	**8.2E-03**	**8.4E-03**
Ammonia-N (mg/l) (Yearly)	0.01	1.68E+01	9.66E-01	--	--	3.86E+01	#######	--	--	1.37E+00	2.49E-01	--	--	6.70E+01	#######	--	--	**3.86E+01**	**1.71E+01**	**--**	**--**
Ammonia-N (mg/l) (High Flow)	0.01	1.51E+01	1.40E+00	--	--	4.20E+01	#######	--	--	1.34E+00	3.58E-01	--	--	7.74E+01	#######	--	--	**4.20E+01**	**4.11E+01**	**--**	**--**
Anthracene	0	--	--	8.3E+03	4.0E+04	--	--	6.6E+05	3.2E+06	--	--	8.3E+02	4.0E+03	--	--	6.6E+04	3.2E+05	**--**	**--**	**6.6E+04**	**3.2E+05**
Antimony	0	--	--	5.6E+00	6.4E+02	--	--	4.5E+02	5.1E+04	--	--	5.6E-01	6.4E+01	--	--	4.5E+01	5.1E+03	**--**	**--**	**4.5E+01**	**5.1E+03**
Arsenic	0.35	3.4E+02	1.5E+02	1.0E+01	--	7.8E+02	9.2E+03	7.7E+02	--	8.5E+01	3.8E+01	1.3E+00	--	4.2E+03	2.3E+03	7.8E+01	--	**7.8E+02**	**2.3E+03**	**7.8E+01**	**--**
Barium	0	--	--	2.0E+03	--	--	--	1.6E+05	--	--	--	2.0E+02	--	--	--	1.6E+04	--	**--**	**--**	**1.6E+04**	**--**
Benzene [C]	0	--	--	2.2E+01	5.1E+02	--	--	3.7E+03	8.6E+04	--	--	2.2E+00	5.1E+01	--	--	3.7E+02	8.6E+03	**--**	**--**	**3.7E+02**	**8.6E+03**
Benzidine[C]	0	--	--	8.6E-04	2.0E-03	--	--	1.4E-01	3.4E-01	--	--	8.6E-05	2.0E-04	--	--	1.4E-02	3.4E-02	**--**	**--**	**1.4E-02**	**3.4E-02**
Benzo (a) anthracene [C]	0	--	--	3.8E-02	1.8E-01	--	--	6.4E+00	3.0E+01	--	--	3.8E-03	1.8E-02	--	--	6.4E-01	3.0E+00	**--**	**--**	**6.4E-01**	**3.0E+00**
Benzo (b) fluoranthene [C]	0	--	--	3.8E-02	1.8E-01	--	--	6.4E+00	3.0E+01	--	--	3.8E-03	1.8E-02	--	--	6.4E-01	3.0E+00	**--**	**--**	**6.4E-01**	**3.0E+00**
Benzo (k) fluoranthene [C]	0	--	--	3.8E-02	1.8E-01	--	--	6.4E+00	3.0E+01	--	--	3.8E-03	1.8E-02	--	--	6.4E-01	3.0E+00	**--**	**--**	**6.4E-01**	**3.0E+00**
Benzo (a) pyrene [C]	0	--	--	3.8E-02	1.8E-01	--	--	6.4E+00	3.0E+01	--	--	3.8E-03	1.8E-02	--	--	6.4E-01	3.0E+00	**--**	**--**	**6.4E-01**	**3.0E+00**
Bis2-Chloroethyl Ether [C]	0	--	--	3.0E-01	5.3E+00	--	--	5.1E+01	8.9E+02	--	--	3.0E-02	5.3E-01	--	--	5.1E+00	8.9E+01	**--**	**--**	**5.1E+00**	**8.9E+01**
Bis2-Chloroisopropyl Ether	0	--	--	1.4E+03	6.5E+04	--	--	1.1E+05	5.2E+06	--	--	1.4E+02	6.5E+03	--	--	1.1E+04	5.2E+05	**--**	**--**	**1.1E+04**	**5.2E+05**
Bis 2-Ethylhexyl Phthalate [C]	0	--	--	1.2E+01	2.2E+01	--	--	2.0E+03	3.7E+03	--	--	1.2E+00	2.2E+00	--	--	2.0E+02	3.7E+02	**--**	**--**	**2.0E+02**	**3.7E+02**
Bromoform [C]	0	--	--	4.3E+01	1.4E+03	--	--	7.2E+03	2.4E+05	--	--	4.3E+00	1.4E+02	--	--	7.2E+02	2.4E+04	**--**	**--**	**7.2E+02**	**2.4E+04**
Butylbenzylphthalate	0	--	--	1.5E+03	1.9E+03	--	--	1.2E+05	1.5E+05	--	--	1.5E+02	1.9E+02	--	--	1.2E+04	1.5E+04	**--**	**--**	**1.2E+04**	**1.5E+04**
Cadmium	0	5.8E+00	9.6E-01	5.0E+00	--	1.3E+01	5.9E+01	4.0E+02	--	7.8E-01	2.4E-01	5.0E-01	--	3.9E+01	1.5E+01	4.0E+01	--	**1.3E+01**	**1.5E+01**	**4.0E+01**	**--**
Carbon Tetrachloride [C]	0	--	--	2.3E+00	1.6E+01	--	--	3.9E+02	2.7E+03	--	--	2.3E-01	1.6E+00	--	--	3.9E+01	2.7E+02	**--**	**--**	**3.9E+01**	**2.7E+02**
Chlordane [C]	0	2.4E+00	4.3E-03	8.0E-03	8.1E-03	5.5E+00	2.7E-01	1.3E+00	1.4E+00	6.0E-01	1.1E-03	8.0E-04	8.1E-04	3.0E+01	6.6E-02	1.3E-01	1.4E-01	**5.5E+00**	**6.6E-02**	**1.3E-01**	**1.4E-01**

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				**Most Limiting Allocations**			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	**Acute**	**Chronic**	**HH (PWS)**	**HH**
Chloride	9120	8.6E+05	2.3E+05	2.5E+05	--	2.0E+06	1.4E+07	1.9E+07	--	2.2E+05	6.4E+04	3.3E+04	--	1.1E+07	3.4E+06	1.9E+06	--	**2.0E+06**	**3.4E+06**	**1.9E+06**	**--**
TRC	0	1.9E+01	1.1E+01	--	--	4.4E+01	6.8E+02	--	--	4.8E+00	2.8E+00	--	--	2.3E+02	1.7E+02	--	--	**4.4E+01**	**1.7E+02**	**--**	**--**
Chlorobenzene	0	--	--	1.3E+02	1.6E+03	--	--	1.0E+04	1.3E+05	--	--	1.3E+01	1.6E+02	--	--	1.0E+03	1.3E+04	**--**	**--**	**1.0E+03**	**1.3E+04**
Chlorodibromomethane[C]	0	--	--	4.0E+00	1.3E+02	--	--	6.7E+02	2.2E+04	--	--	4.0E-01	1.3E+01	--	--	6.7E+01	2.2E+03	**--**	**--**	**6.7E+01**	**2.2E+03**
Chloroform	0	--	--	3.4E+02	1.1E+04	--	--	2.7E+04	8.8E+05	--	--	3.4E+01	1.1E+03	--	--	2.7E+03	8.8E+04	**--**	**--**	**2.7E+03**	**8.8E+04**
2-Chloronaphthalene	0	--	--	1.0E+03	1.6E+03	--	--	8.0E+04	1.3E+05	--	--	1.0E+02	1.6E+02	--	--	8.0E+03	1.3E+04	**--**	**--**	**8.0E+03**	**1.3E+04**
2-Chlorophenol	0	--	--	8.1E+01	1.5E+02	--	--	6.5E+03	1.2E+04	--	--	8.1E+00	1.5E+01	--	--	6.5E+02	1.2E+03	**--**	**--**	**6.5E+02**	**1.2E+03**
Chlorpyrifos	0	8.3E-02	4.1E-02	--	--	1.9E-01	2.5E+00	--	--	2.1E-02	1.0E-02	--	--	1.0E+00	6.3E-01	--	--	**1.9E-01**	**6.3E-01**	**--**	**--**
Chromium III	0	7.6E+02	6.2E+01	--	--	1.7E+03	3.8E+03	--	--	1.2E+02	1.6E+01	--	--	6.0E+03	9.6E+02	--	--	**1.7E+03**	**9.6E+02**	**--**	**--**
Chromium VI	0	1.6E+01	1.1E+01	--	--	3.7E+01	6.8E+02	--	--	4.0E+00	2.8E+00	--	--	2.0E+02	1.7E+02	--	--	**3.7E+01**	**1.7E+02**	**--**	**--**
Chromium, Total	0.18	--	--	1.0E+02	--	--	--	8.0E+03	--	--	--	1.0E+01	--	--	--	8.0E+02	--	**--**	**--**	**8.0E+02**	**--**
Chrysene [C]	0	--	--	3.8E-03	1.8E-02	--	--	6.4E-01	3.0E+00	--	--	3.8E-04	1.8E-03	--	--	6.4E-02	3.0E-01	**--**	**--**	**6.4E-02**	**3.0E-01**
Copper	0.65	1.9E+01	7.5E+00	1.3E+03	--	4.2E+01	4.2E+02	1.0E+05	--	3.3E+00	2.4E+00	1.3E+02	--	1.3E+02	1.1E+02	1.0E+04	--	**4.2E+01**	**1.1E+02**	**1.0E+04**	**--**
Cyanide, Free	0	2.2E+01	5.2E+00	1.4E+02	1.6E+04	5.0E+01	3.2E+02	1.1E+04	1.3E+06	5.5E+00	1.3E+00	1.4E+01	1.6E+03	2.7E+02	8.0E+01	1.1E+03	1.3E+05	**5.0E+01**	**8.0E+01**	**1.1E+03**	**1.3E+05**
DDD [C]	0	--	--	3.1E-03	3.1E-03	--	--	5.2E-01	5.2E-01	--	--	3.1E-04	3.1E-04	--	--	5.2E-02	5.2E-02	**--**	**--**	**5.2E-02**	**5.2E-02**
DDE [C]	0	--	--	2.2E-03	2.2E-03	--	--	3.7E-01	3.7E-01	--	--	2.2E-04	2.2E-04	--	--	3.7E-02	3.7E-02	**--**	**--**	**3.7E-02**	**3.7E-02**
DDT [C]	0	1.1E+00	1.0E-03	2.2E-03	2.2E-03	2.5E+00	6.2E-02	3.7E-01	3.7E-01	2.8E-01	2.5E-04	2.2E-04	2.2E-04	1.4E+01	1.5E-02	3.7E-02	3.7E-02	**2.5E+00**	**1.5E-02**	**3.7E-02**	**3.7E-02**
Demeton	0	--	1.0E-01	--	--	--	6.2E+00	--	--	--	2.5E-02	--	--	--	1.5E+00	--	--	**--**	**1.5E+00**	**--**	**--**
Diazinon	0	1.7E-01	1.7E-01	--	--	3.9E-01	1.0E+01	--	--	4.3E-02	4.3E-02	--	--	2.1E+00	2.6E+00	--	--	**3.9E-01**	**2.6E+00**	**--**	**--**
Dibenz(a,h)anthracene [C]	0	--	--	3.8E-02	1.8E-01	--	--	6.4E+00	3.0E+01	--	--	3.8E-03	1.8E-02	--	--	6.4E-01	3.0E+00	**--**	**--**	**6.4E-01**	**3.0E+00**
1,2-Dichlorobenzene	0	--	--	4.2E+02	1.3E+03	--	--	3.4E+04	1.0E+05	--	--	4.2E+01	1.3E+02	--	--	3.4E+03	1.0E+04	**--**	**--**	**3.4E+03**	**1.0E+04**
1,3-Dichlorobenzene	0	--	--	3.2E+02	9.6E+02	--	--	2.6E+04	7.7E+04	--	--	3.2E+01	9.6E+01	--	--	2.6E+03	7.7E+03	**--**	**--**	**2.6E+03**	**7.7E+03**
1,4-Dichlorobenzene	0	--	--	6.3E+01	1.9E+02	--	--	5.0E+03	1.5E+04	--	--	6.3E+00	1.9E+01	--	--	5.0E+02	1.5E+03	**--**	**--**	**5.0E+02**	**1.5E+03**
3,3-Dichlorobenzidine[C]	0	--	--	2.1E-01	2.8E-01	--	--	3.5E+01	4.7E+01	--	--	2.1E-02	2.8E-02	--	--	3.5E+00	4.7E+00	**--**	**--**	**3.5E+00**	**4.7E+00**
Dichlorobromomethane [C]	0	--	--	5.5E+00	1.7E+02	--	--	9.3E+02	2.9E+04	--	--	5.5E-01	1.7E+01	--	--	9.3E+01	2.9E+03	**--**	**--**	**9.3E+01**	**2.9E+03**
1,2-Dichloroethane [C]	0	--	--	3.8E+00	3.7E+02	--	--	6.4E+02	6.2E+04	--	--	3.8E-01	3.7E+01	--	--	6.4E+01	6.2E+03	**--**	**--**	**6.4E+01**	**6.2E+03**
1,1-Dichloroethylene	0	--	--	3.3E+02	7.1E+03	--	--	2.6E+04	5.7E+05	--	--	3.3E+01	7.1E+02	--	--	2.6E+03	5.7E+04	**--**	**--**	**2.6E+03**	**5.7E+04**
1,2-trans-dichloroethylene	0	--	--	1.4E+02	1.0E+04	--	--	1.1E+04	8.0E+05	--	--	1.4E+01	1.0E+03	--	--	1.1E+03	8.0E+04	**--**	**--**	**1.1E+03**	**8.0E+04**
2,4-Dichlorophenol	0	--	--	7.7E+01	2.9E+02	--	--	6.2E+03	2.3E+04	--	--	7.7E+00	2.9E+01	--	--	6.2E+02	2.3E+03	**--**	**--**	**6.2E+02**	**2.3E+03**
2,4-Dichlorophenoxy acetic acid (2,4-D)	0	--	--	1.0E+02	--	--	--	8.0E+03	--	--	--	1.0E+01	--	--	--	8.0E+02	--	**--**	**--**	**8.0E+02**	**--**
1,2-Dichloropropane[C]	0	--	--	5.0E+00	1.5E+02	--	--	8.4E+02	2.5E+04	--	--	5.0E-01	1.5E+01	--	--	8.4E+01	2.5E+03	**--**	**--**	**8.4E+01**	**2.5E+03**
1,3-Dichloropropene [C]	0	--	--	3.4E+00	2.1E+02	--	--	5.7E+02	3.5E+04	--	--	3.4E-01	2.1E+01	--	--	5.7E+01	3.5E+03	**--**	**--**	**5.7E+01**	**3.5E+03**
Dieldrin [C]	0	2.4E-01	5.6E-02	5.2E-04	5.4E-04	5.5E-01	3.5E+00	8.8E-02	9.1E-02	6.0E-02	1.4E-02	5.2E-05	5.4E-05	3.0E+00	8.6E-01	8.8E-03	9.1E-03	**5.5E-01**	**8.6E-01**	**8.8E-03**	**9.1E-03**
Diethyl Phthalate	0	--	--	1.7E+04	4.4E+04	--	--	1.4E+06	3.5E+06	--	--	1.7E+03	4.4E+03	--	--	1.4E+05	3.5E+05	**--**	**--**	**1.4E+05**	**3.5E+05**
2,4-Dimethylphenol	0	--	--	3.8E+02	8.5E+02	--	--	3.0E+04	6.8E+04	--	--	3.8E+01	8.5E+01	--	--	3.0E+03	6.8E+03	**--**	**--**	**3.0E+03**	**6.8E+03**
Dimethyl Phthalate	0	--	--	2.7E+05	1.1E+06	--	--	2.2E+07	8.8E+07	--	--	2.7E+04	1.1E+05	--	--	2.2E+06	8.8E+06	**--**	**--**	**2.2E+06**	**8.8E+06**
Di-n-Butyl Phthalate	0	--	--	2.0E+03	4.5E+03	--	--	1.6E+05	3.6E+05	--	--	2.0E+02	4.5E+02	--	--	1.6E+04	3.6E+04	**--**	**--**	**1.6E+04**	**3.6E+04**
2,4 Dinitrophenol	0	--	--	6.9E+01	5.3E+03	--	--	5.5E+03	4.2E+05	--	--	6.9E+00	5.3E+02	--	--	5.5E+02	4.2E+04	**--**	**--**	**5.5E+02**	**4.2E+04**
2-Methyl-4,6-Dinitrophenol	0	--	--	1.3E+01	2.8E+02	--	--	1.0E+03	2.2E+04	--	--	1.3E+00	2.8E+01	--	--	1.0E+02	2.2E+03	**--**	**--**	**1.0E+02**	**2.2E+03**
2,4-Dinitrotoluene [C]	0	--	--	1.1E+00	3.4E+01	--	--	1.9E+02	5.7E+03	--	--	1.1E-01	3.4E+00	--	--	1.9E+01	5.7E+02	**--**	**--**	**1.9E+01**	**5.7E+02**
Dioxin 2,3,7,8-tetrachlorodibenzo-p-dioxin	0	--	--	5.0E-08	5.1E-08	--	--	4.0E-06	4.1E-06	--	--	5.0E-09	5.1E-09	--	--	4.0E-07	4.1E-07	**--**	**--**	**4.0E-07**	**4.1E-07**
1,2-Diphenylhydrazine[C]	0	--	--	3.6E-01	2.0E+00	--	--	6.1E+01	3.4E+02	--	--	3.6E-02	2.0E-01	--	--	6.1E+00	3.4E+01	**--**	**--**	**6.1E+00**	**3.4E+01**
Alpha-Endosulfan	0	2.2E-01	5.6E-02	6.2E+01	8.9E+01	5.0E-01	3.5E+00	5.0E+03	7.1E+03	5.5E-02	1.4E-02	6.2E+00	8.9E+00	2.7E+00	8.6E-01	5.0E+02	7.1E+02	**5.0E-01**	**8.6E-01**	**5.0E+02**	**7.1E+02**

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				**Most Limiting Allocations**			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	**Acute**	**Chronic**	**HH (PWS)**	**HH**
Beta-Endosulfan	0	2.2E-01	5.6E-02	6.2E+01	8.9E+01	5.0E-01	3.5E+00	5.0E+03	7.1E+03	5.5E-02	1.4E-02	6.2E+00	8.9E+00	2.7E+00	8.6E-01	5.0E+02	7.1E+02	**5.0E-01**	**8.6E-01**	**5.0E+02**	**7.1E+02**
Alpha + Beta Endosulfan	0	2.2E-01	5.6E-02	--	--	5.0E-01	3.5E+00	--	--	5.5E-02	1.4E-02	--	--	2.7E+00	8.6E-01	--	--	**5.0E-01**	**8.6E-01**	**--**	**--**
Endosulfan Sulfate	0	--	--	6.2E+01	8.9E+01	--	--	5.0E+03	7.1E+03	--	--	6.2E+00	8.9E+00	--	--	5.0E+02	7.1E+02	**--**	**--**	**5.0E+02**	**7.1E+02**
Endrin	0	8.6E-02	3.6E-02	5.9E-02	6.0E-02	2.0E-01	2.2E+00	4.7E+00	4.8E+00	2.2E-02	9.0E-03	5.9E-03	6.0E-03	1.1E+00	5.6E-01	4.7E-01	4.8E-01	**2.0E-01**	**5.6E-01**	**4.7E-01**	**4.8E-01**
Endrin Aldehyde	0	--	--	2.9E-01	3.0E-01	--	--	2.3E+01	2.4E+01	--	--	2.9E-02	3.0E-02	--	--	2.3E+00	2.4E+00	**--**	**--**	**2.3E+00**	**2.4E+00**
Ethylbenzene	0	--	--	5.3E+02	2.1E+03	--	--	4.2E+04	1.7E+05	--	--	5.3E+01	2.1E+02	--	--	4.2E+03	1.7E+04	**--**	**--**	**4.2E+03**	**1.7E+04**
Fluoranthene	0	--	--	1.3E+02	1.4E+02	--	--	1.0E+04	1.1E+04	--	--	1.3E+01	1.4E+01	--	--	1.0E+03	1.1E+03	**--**	**--**	**1.0E+03**	**1.1E+03**
Fluorene	0	--	--	1.1E+03	5.3E+03	--	--	8.8E+04	4.2E+05	--	--	1.1E+02	5.3E+02	--	--	8.8E+03	4.2E+04	**--**	**--**	**8.8E+03**	**4.2E+04**
Foaming Agents	0	--	--	5.0E+02	--	--	--	4.0E+04	--	--	--	5.0E+01	--	--	--	4.0E+03	--	**--**	**--**	**4.0E+03**	**--**
Guthion	0	--	1.0E-02	--	--	--	6.2E-01	--	--	--	2.5E-03	--	--	--	1.5E-01	--	--	**--**	**1.5E-01**	**--**	**--**
Heptachlor [C]	0	5.2E-01	3.8E-03	7.9E-04	7.9E-04	1.2E+00	2.3E-01	1.3E-01	1.3E-01	1.3E-01	9.5E-04	7.9E-05	7.9E-05	6.4E+00	5.9E-02	1.3E-02	1.3E-02	**1.2E+00**	**5.9E-02**	**1.3E-02**	**1.3E-02**
Heptachlor Epoxide[C]	0	5.2E-01	3.8E-03	3.9E-04	3.9E-04	1.2E+00	2.3E-01	6.6E-02	6.6E-02	1.3E-01	9.5E-04	3.9E-05	3.9E-05	6.4E+00	5.9E-02	6.6E-03	6.6E-03	**1.2E+00**	**5.9E-02**	**6.6E-03**	**6.6E-03**
Hexachlorobenzene[C]	0	--	--	2.8E-03	2.9E-03	--	--	4.7E-01	4.9E-01	--	--	2.8E-04	2.9E-04	--	--	4.7E-02	4.9E-02	**--**	**--**	**4.7E-02**	**4.9E-02**
Hexachlorobutadiene[C]	0	--	--	4.4E+00	1.8E+02	--	--	7.4E+02	3.0E+04	--	--	4.4E-01	1.8E+01	--	--	7.4E+01	3.0E+03	**--**	**--**	**7.4E+01**	**3.0E+03**
Hexachlorocyclohexane Alpha-BHC[C]	0	--	--	2.6E-02	4.9E-02	--	--	4.4E+00	8.2E+00	--	--	2.6E-03	4.9E-03	--	--	4.4E-01	8.2E-01	**--**	**--**	**4.4E-01**	**8.2E-01**
Hexachlorocyclohexane Beta-BHC[C]	0	--	--	9.1E-02	1.7E-01	--	--	1.5E+01	2.9E+01	--	--	9.1E-03	1.7E-02	--	--	1.5E+00	2.9E+00	**--**	**--**	**1.5E+00**	**2.9E+00**
Hexachlorocyclohexane Gamma-BHC[C] (Lindane)	0	9.5E-01	--	9.8E-01	1.8E+00	2.2E+00	--	1.6E+02	3.0E+02	2.4E-01	--	9.8E-02	1.8E-01	1.2E+01	--	1.6E+01	3.0E+01	**2.2E+00**	**--**	**1.6E+01**	**3.0E+01**
Hexachlorocyclopentadiene	0	--	--	4.0E+01	1.1E+03	--	--	3.2E+03	8.8E+04	--	--	4.0E+00	1.1E+02	--	--	3.2E+02	8.8E+03	**--**	**--**	**3.2E+02**	**8.8E+03**
Hexachloroethane[C]	0	--	--	1.4E+01	3.3E+01	--	--	2.4E+03	5.6E+03	--	--	1.4E+00	3.3E+00	--	--	2.4E+02	5.6E+02	**--**	**--**	**2.4E+02**	**5.6E+02**
Hydrogen Sulfide	0	--	2.0E+00	--	--	--	1.2E+02	--	--	--	5.0E-01	--	--	--	3.1E+01	--	--	**--**	**3.1E+01**	**--**	**--**
Indeno (1,2,3-cd) pyrene [C]	0	--	--	3.8E-02	1.8E-01	--	--	6.4E+00	3.0E+01	--	--	3.8E-03	1.8E-02	--	--	6.4E-01	3.0E+00	**--**	**--**	**6.4E-01**	**3.0E+00**
Iron	0	--	--	3.0E+02	--	--	--	2.4E+04	--	--	--	3.0E+01	--	--	--	2.4E+03	--	**--**	**--**	**2.4E+03**	**--**
Isophorone[C]	0	--	--	3.5E+02	9.6E+03	--	--	5.9E+04	1.6E+06	--	--	3.5E+01	9.6E+02	--	--	5.9E+03	1.6E+05	**--**	**--**	**5.9E+03**	**1.6E+05**
Kepone	0	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--	--	**--**	**0.0E+00**	**--**	**--**
Lead	0	1.9E+02	1.0E+01	1.5E+01	--	4.2E+02	6.4E+02	1.2E+03	--	2.3E+01	2.6E+00	1.5E+00	--	1.1E+03	1.6E+02	1.2E+02	--	**4.2E+02**	**1.6E+02**	**1.2E+02**	**--**
Malathion	0	--	1.0E-01	--	--	--	6.2E+00	--	--	--	2.5E-02	--	--	--	1.5E+00	--	--	**--**	**1.5E+00**	**--**	**--**
Manganese	14.32	--	--	5.0E+01	--	--	--	2.9E+03	--	--	--	1.8E+01	--	--	--	3.0E+02	--	**--**	**--**	**3.0E+02**	**--**
Mercury	0	1.4E+00	7.7E-01	- -	- -	3.2E+00	4.7E+01	- -	- -	3.5E-01	1.9E-01	- -	--	1.7E+01	1.2E+01	- -	--	**3.2E+00**	**1.2E+01**	**- -**	**- -**
Methyl Bromide	0	--	--	4.7E+01	1.5E+03	--	--	3.8E+03	1.2E+05	--	--	4.7E+00	1.5E+02	--	--	3.8E+02	1.2E+04	**--**	**--**	**3.8E+02**	**1.2E+04**
Methylene Chloride [C]	0	--	--	4.6E+01	5.9E+03	--	--	7.7E+03	9.9E+05	--	--	4.6E+00	5.9E+02	--	--	7.7E+02	9.9E+04	**--**	**--**	**7.7E+02**	**9.9E+04**
Methoxychlor	0	--	3.0E-02	1.0E+02	--	--	1.9E+00	8.0E+03	--	--	7.5E-03	1.0E+01	--	--	4.6E-01	8.0E+02	--	**--**	**4.6E-01**	**8.0E+02**	**--**
Mirex	0	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--	--	**--**	**0.0E+00**	**--**	**--**
Nickel	0.39	2.4E+02	1.7E+01	6.1E+02	4.6E+03	5.6E+02	1.0E+03	4.9E+04	3.7E+05	3.9E+01	4.5E+00	6.1E+01	4.6E+02	1.9E+03	2.6E+02	4.9E+03	3.7E+04	**5.6E+02**	**2.6E+02**	**4.9E+03**	**3.7E+04**
Nitrate (as N)	940	--	--	1.0E+04	--	--	--	7.3E+05	--	--	--	1.8E+03	--	--	--	7.4E+04	--	**--**	**--**	**7.4E+04**	**--**
Nitrobenzene	0	--	--	1.7E+01	6.9E+02	--	--	1.4E+03	5.5E+04	--	--	1.7E+00	6.9E+01	--	--	1.4E+02	5.5E+03	**--**	**--**	**1.4E+02**	**5.5E+03**
N-Nitrosodimethylamine[C]	0	--	--	6.9E-03	3.0E+01	--	--	1.2E+00	5.1E+03	--	--	6.9E-04	3.0E+00	--	--	1.2E-01	5.1E+02	**--**	**--**	**1.2E-01**	**5.1E+02**
N-Nitrosodiphenylamine[C]	0	--	--	3.3E+01	6.0E+01	--	--	5.6E+03	1.0E+04	--	--	3.3E+00	6.0E+00	--	--	5.6E+02	1.0E+03	**--**	**--**	**5.6E+02**	**1.0E+03**
N-Nitrosodi-n-propylamine[C]	0	--	--	5.0E-02	5.1E+00	--	--	8.4E+00	8.6E+02	--	--	5.0E-03	5.1E-01	--	--	8.4E-01	8.6E+01	**--**	**--**	**8.4E-01**	**8.6E+01**
Nonylphenol	0	2.8E+01	6.6E+00	--	--	6.4E+01	4.1E+02	--	--	7.0E+00	1.7E+00	--	--	3.5E+02	1.0E+02	--	--	**6.4E+01**	**1.0E+02**	**--**	**--**
Parathion	0	6.5E-02	1.3E-02	--	--	1.5E-01	8.0E-01	--	--	1.6E-02	3.3E-03	--	--	8.0E-01	2.0E-01	--	--	**1.5E-01**	**2.0E-01**	**--**	**--**
PCB Total[C]	0.000167	--	1.4E-02	6.4E-04	6.4E-04	--	8.5E-01	8.0E-02	8.0E-02	--	3.6E-03	2.1E-04	2.1E-04	--	2.1E-01	8.1E-03	8.1E-03	**--**	**2.1E-01**	**8.1E-03**	**8.1E-03**
Pentachlorophenol [C]	0	9.5E+00	9.0E+00	2.7E+00	3.0E+01	2.2E+01	5.5E+02	4.5E+02	5.1E+03	2.9E+00	2.2E+00	2.7E-01	3.0E+00	1.4E+02	1.4E+02	4.5E+01	5.1E+02	**2.2E+01**	**1.4E+02**	**4.5E+01**	**5.1E+02**

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				**Most Limiting Allocations**			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	**Acute**	**Chronic**	**HH (PWS)**	**HH**
Phenol	0	--	--	1.0E+04	8.6E+05	--	--	8.0E+05	6.9E+07	--	--	1.0E+03	8.6E+04	--	--	8.0E+04	6.9E+06	**--**	**--**	**8.0E+04**	**6.9E+06**
Pyrene	0	--	--	8.3E+02	4.0E+03	--	--	6.6E+04	3.2E+05	--	--	8.3E+01	4.0E+02	--	--	6.6E+03	3.2E+04	**--**	**--**	**6.6E+03**	**3.2E+04**
Radionuclides	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**--**	**--**	**--**	**--**
Gross Alpha Activity (pCi/L)	0	--	--	1.5E+01	--	--	--	1.2E+03	--	--	--	1.5E+00	--	--	--	1.2E+02	--	**--**	**--**	**1.2E+02**	**--**
Beta and Photon Activity (mrem/yr)	0	--	--	4.0E+00	--	--	--	3.2E+02	--	--	--	4.0E-01	--	--	--	3.2E+01	--	**--**	**--**	**3.2E+01**	**--**
Radium 226 + 228 (pCi/L)	0	--	--	5.0E+00	--	--	--	4.0E+02	--	--	--	5.0E-01	--	--	--	4.0E+01	--	**--**	**--**	**4.0E+01**	**--**
Uranium (ug/l)	0	--	--	3.0E+01	--	--	--	2.4E+03	--	--	--	3.0E+00	--	--	--	2.4E+02	--	**--**	**--**	**2.4E+02**	**--**
Selenium, Total Recoverable	0	2.0E+01	5.0E+00	1.7E+02	4.2E+03	4.6E+01	3.1E+02	1.4E+04	3.4E+05	5.0E+00	1.3E+00	1.7E+01	4.2E+02	2.5E+02	7.7E+01	1.4E+03	3.4E+04	**4.6E+01**	**7.7E+01**	**1.4E+03**	**3.4E+04**
Silver	0	6.3E+00	--	--	--	1.4E+01	--	--	--	6.1E-01	--	--	--	3.0E+01	--	--	--	**1.4E+01**	**--**	**--**	**--**
Sulfate	8690	--	--	2.5E+05	--	--	--	1.9E+07	--	--	--	3.3E+04	--	--	--	1.9E+06	--	**--**	**--**	**1.9E+06**	**--**
1,1,2,2-Tetrachloroethane[C]	0	--	--	1.7E+00	4.0E+01	--	--	2.9E+02	6.7E+03	--	--	1.7E-01	4.0E+00	--	--	2.9E+01	6.7E+02	**--**	**--**	**2.9E+01**	**6.7E+02**
Tetrachloroethylene[C]	0	--	--	6.9E+00	3.3E+01	--	--	1.2E+03	5.6E+03	--	--	6.9E-01	3.3E+00	--	--	1.2E+02	5.6E+02	**--**	**--**	**1.2E+02**	**5.6E+02**
Thallium	0	--	--	2.4E-01	4.7E-01	--	--	1.9E+01	3.8E+01	--	--	2.4E-02	4.7E-02	--	--	1.9E+00	3.8E+00	**--**	**--**	**1.9E+00**	**3.8E+00**
Toluene	0	--	--	5.1E+02	6.0E+03	--	--	4.1E+04	4.8E+05	--	--	5.1E+01	6.0E+02	--	--	4.1E+03	4.8E+04	**--**	**--**	**4.1E+03**	**4.8E+04**
Total dissolved solids	0	--	--	5.0E+05	--	--	--	4.0E+07	--	--	--	5.0E+04	--	--	--	4.0E+06	--	**--**	**--**	**4.0E+06**	**--**
Toxaphene [C]	0	7.3E-01	2.0E-04	2.8E-03	2.8E-03	1.7E+00	1.2E-02	4.7E-01	4.7E-01	1.8E-01	5.0E-05	2.8E-04	2.8E-04	9.0E+00	3.1E-03	4.7E-02	4.7E-02	**1.7E+00**	**3.1E-03**	**4.7E-02**	**4.7E-02**
Tributyltin	0	4.6E-01	7.2E-02	--	--	1.1E+00	4.4E+00	--	--	1.2E-01	1.8E-02	--	--	5.7E+00	1.1E+00	--	--	**1.1E+00**	**1.1E+00**	**--**	**--**
1,2,4-Trichlorobenzene	0	--	--	3.5E+01	7.0E+01	--	--	2.8E+03	5.6E+03	--	--	3.5E+00	7.0E+00	--	--	2.8E+02	5.6E+02	**--**	**--**	**2.8E+02**	**5.6E+02**
1,1,2-Trichloroethane[C]	0	--	--	5.9E+00	1.6E+02	--	--	9.9E+02	2.7E+04	--	--	5.9E-01	1.6E+01	--	--	9.9E+01	2.7E+03	**--**	**--**	**9.9E+01**	**2.7E+03**
Trichloroethylene [C]	0	--	--	2.5E+01	3.0E+02	--	--	4.2E+03	5.1E+04	--	--	2.5E+00	3.0E+01	--	--	4.2E+02	5.1E+03	**--**	**--**	**4.2E+02**	**5.1E+03**
2,4,6-Trichlorophenol [C]	0	--	--	1.4E+01	2.4E+01	--	--	2.4E+03	4.0E+03	--	--	1.4E+00	2.4E+00	--	--	2.4E+02	4.0E+02	**--**	**--**	**2.4E+02**	**4.0E+02**
2-(2,4,5-Trichlorophenoxy) propionic acid (Silvex)	0	--	--	5.0E+01	--	--	--	4.0E+03	--	--	--	5.0E+00	--	--	--	4.0E+02	--	**--**	**--**	**4.0E+02**	**--**
Vinyl Chloride[C]	0	--	--	2.5E-01	2.4E+01	--	--	4.2E+01	4.0E+03	--	--	2.5E-02	2.4E+00	--	--	4.2E+00	4.0E+02	**--**	**--**	**4.2E+00**	**4.0E+02**
Zinc	3.68	1.6E+02	9.9E+01	7.4E+03	2.6E+04	3.6E+02	5.9E+03	5.9E+05	2.1E+06	2.7E+01	2.7E+01	7.4E+02	2.6E+03	1.2E+03	1.5E+03	5.9E+04	2.1E+05	**3.6E+02**	**1.5E+03**	**5.9E+04**	**2.1E+05**

Notes:

1. All concentrations expressed as micrograms/liter (ug/l), unless noted otherwise
2. Discharge flow is highest monthly average or Form 2C maximum for Industries and design flow for Municipals
3. Metals measured as Dissolved, unless specified otherwise
4. "C" indicates a carcinogenic parameter
5. Regular WLAs are mass balances (minus background concentration) using the % of stream flow entered above under Mixing Information.
   Antidegradation WLAs are based upon a complete mix.
6. Antideg. Baseline = (0.25(WQC - background conc.) + background conc.) for acute and chronic
   = (0.1(WQC - background conc.) + background conc.) for human health
7. WLAs established at the following stream flows: 1Q10 for Acute, 30Q10 for Chronic Ammonia, 7Q10 for Other Chronic, 30Q5 for Non-carcinogens and Harmonic Mean for Carcinogens. To apply mixing ratios from a model set the stream flow equal to (mixing ratio - 1), effluent flow equal to 1 and 100% mix.

Metal	Target Value (SSTV)
Antimony	4.5E+01
Arsenic	7.8E+01
Barium	1.6E+04
Cadmium	5.3E+00
Chromium III	5.8E+02
Chromium VI	1.5E+01
Copper	1.7E+01
Iron	2.4E+03
Lead	9.6E+01
Manganese	3.0E+02
Mercury	1.3E+00
Nickel	1.5E+02
Selenium	1.8E+01
Silver	5.8E+00
Zinc	1.4E+02

Note: do not use QL's lower than the minimum QL's provided in agency guidance

9/9/2014 4:33:51 PM

Facility = PFRWTA - 9 MGD
Chemical = tPCBs
Chronic averaging period = 4
WLAa =
WLAc = 0.85
Q.L. = 0.00001
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 4
Expected Value = .000727
Variance = .000000
C.V. = 0.6
97th percentile daily values = .001769
97th percentile 4 day average = .001209
97th percentile 30 day average= .000876
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

No Limit is required for this material

The data are:

0.000049925
0.002285053
0.000164221
0.000409189

18.0 MGD DESIGN FLOW

Mixing Zone Predictions for Pepper's Ferry RWTA (annual)

Effluent Flow = 18.0 MGD
Stream 7Q10 = 546 MGD
Stream 30Q10 = 633 MGD
Stream 1Q10 = 436 MGD
Stream slope = 0.00093 ft/ft
Stream width = 475 ft
Bottom scale = 4
Channel scale = 1

Mixing Zone Predictions @ 7Q10

Depth = 2.8438 ft
Length = 70288.09 ft
Velocity = .6463 ft/sec
Residence Time = 1.2587 days

Recommendation:

A complete mix assumption is appropriate for this situation and the entire 7Q10 may be used.

Mixing Zone Predictions @ 30Q10

Depth = 3.1007 ft
Length = 65353.19 ft
Velocity = .6842 ft/sec
Residence Time = 1.1055 days

Recommendation:

A complete mix assumption is appropriate for this situation and the entire 30Q10 may be used.

Mixing Zone Predictions @ 1Q10

Depth = 2.4952 ft
Length = 78455.96 ft
Velocity = .5929 ft/sec
Residence Time = 36.7542 hours

Recommendation:

A complete mix assumption is appropriate for this situation providing no more than 2.72% of the 1Q10 is used.

Mixing Zone Predictions for Pepper's Ferry RWTA (wet season)

Effluent Flow = 18.0 MGD
Stream 7Q10 = 758 MGD
Stream 30Q10 = 1053 MGD
Stream 1Q10 = 515 MGD
Stream slope = 0.00093 ft/ft
Stream width = 475 ft
Bottom scale = 4
Channel scale = 1

Mixing Zone Predictions @ 7Q10

Depth = 3.4473 ft
Length = 59772.94 ft
Velocity = .7336 ft/sec
Residence Time = .9431 days

Recommendation:

A complete mix assumption is appropriate for this situation and the entire 7Q10 may be used.

Mixing Zone Predictions @ 30Q10

Depth = 4.1877 ft
Length = 50722.99 ft
Velocity = .8335 ft/sec
Residence Time = .7044 days

Recommendation:

A complete mix assumption is appropriate for this situation and the entire 30Q10 may be used.

Mixing Zone Predictions @ 1Q10

Depth = 2.7485 ft
Length = 72331.88 ft
Velocity = .632 ft/sec
Residence Time = 31.7926 hours

Recommendation:

A complete mix assumption is appropriate for this situation providing no more than 3.15% of the 1Q10 is used.

2/26/2014 9:19:39 AM

Facility = PFRWTA
Chemical = stream ammonia (annual) in mg/L
Chronic averaging period = 30
WLAa =
WLAc =
Q.L. = 0.04
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 48
Expected Value = .043450
Variance = .000118
C.V. = 0.251004
97th percentile daily values = .075492
97th percentile 4 day average = .052126
97th percentile 30 day average= .045693
< Q.L. = 37
Model used = delta lognormal

No Limit is required for this material

The data are:

0.04
0.13
0.04
0.05
0.05
0.05
0.05
0.06
0.04
0.05
0.05
0
0
0
0
0
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2/26/2014 9:26:29 AM

Facility = PFRWTA
Chemical = stream ammonia (wet season) in mg/L
Chronic averaging period = 30
WLAa =
WLAc =
Q.L. = 0.04
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 21
Expected Value = .026262
Variance = .000248
C.V. = 0.6
97th percentile daily values = .063907
97th percentile 4 day average = .043695
97th percentile 30 day average= .031674
< Q.L. = 18
Model used = BPJ Assumptions, Type 1 data

No Limit is required for this material

The data are:

0.05
0.04
0.05
0
0
0
0
0
0
0
0
0
0
0
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0

2/24/2014 3:02:12 PM

Facility = PFRWTA
Chemical = stream arsenic in ug/L
Chronic averaging period = 4
WLAa =
WLAc =
Q.L. = 0.01
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 2
Expected Value = .345
Variance = .042849
C.V. = 0.6
97th percentile daily values = .839529
97th percentile 4 day average = .574007
97th percentile 30 day average= .416088
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

No Limit is required for this material

The data are:

0.44
0.25

2/24/2014 3:37:46 PM

Facility = PFRWTA
Chemical = stream chloride in mg/l
Chronic averaging period = 4
WLAa =
WLAc =
Q.L. = 1
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 18
Expected Value = 9.11668
Variance = 3.42471
C.V. = 0.202990
97th percentile daily values = 13.0383
97th percentile 4 day average = 10.9726
97th percentile 30 day average= 9.75222
< Q.L. = 0
Model used = lognormal

No Limit is required for this material

The data are:

9.9
11.7
10.2
10
15.4
9.2
8.2
8
8.6
9.1
8.1
6.4
6.6
8.8
9.1
9.2
8.1
7.5

2/24/2014 3:06:46 PM

Facility = PFRWTA
Chemical = stream chromium in ug/L
Chronic averaging period = 4
WLAa =
WLAc =
Q.L. = 0.01
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 2
Expected Value = .18
Variance = .011664
C.V. = 0.6
97th percentile daily values = .438015
97th percentile 4 day average = .299482
97th percentile 30 day average= .217089
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

No Limit is required for this material

The data are:

0.18
0.18

2/24/2014 3:11:55 PM

Facility = PFRWTA
Chemical = stream copper in ug/L
Chronic averaging period = 4
WLAa =
WLAc =
Q.L. = 0.01
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 2
Expected Value = .645
Variance = .149769
C.V. = 0.6
97th percentile daily values = 1.56955
97th percentile 4 day average = 1.07314
97th percentile 30 day average= .777904
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

No Limit is required for this material

The data are:

0.67
0.62

2/24/2014 3:14:34 PM

Facility = PFRWTA
Chemical = stream manganese in ug/L
Chronic averaging period = 4
WLAa =
WLAc =
Q.L. = 0.01
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 2
Expected Value = 14.315
Variance = 73.7709
C.V. = 0.6
97th percentile daily values = 34.8343
97th percentile 4 day average = 23.8171
97th percentile 30 day average= 17.2646
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

No Limit is required for this material

The data are:

13.23
15.4

2/24/2014 3:17:08 PM

Facility = PFRWTA
Chemical = stream nickel in mg/L
Chronic averaging period = 4
WLAa =
WLAc =
Q.L. = 0.01
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 2
Expected Value = .385
Variance = .053361
C.V. = 0.6
97th percentile daily values = .936865
97th percentile 4 day average = .640559
97th percentile 30 day average= .464330
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

No Limit is required for this material

The data are:

0.55
0.22

2/24/2014 3:49:52 PM

Facility = PFRWTA
Chemical = nitrate in mg/L
Chronic averaging period = 4
WLAa =
WLAc =
Q.L. = 0.1
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 40
Expected Value = .936187
Variance = .181015
C.V. = 0.454459
97th percentile daily values = 1.92557
97th percentile 4 day average = 1.39227
97th percentile 30 day average= 1.08229
< Q.L. = 0
Model used = lognormal

No Limit is required for this material

The data are:

1.34
2.11
1.66
1.08
1.37
1.02
1.56
0.56
0.51
0.35
0.47
0.67
0.83
0.96
1.25
0.88
0.47
0.62
0.67

0.72
1.05
0.85
1.31
1.28
0.98
0.62
1.72
0.69
0.45
0.53
0.59
0.72
0.64
0.81
0.55
1.05
0.93
0.91
0.75
1.88

2/24/2014 3:32:10 PM

Facility = PFRWTA
Chemical = stream sulfate in mg/L as SO4
Chronic averaging period = 4
WLAa =
WLAc =
Q.L. = 1
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 18
Expected Value = 8.69636
Variance = 1.89373
C.V. = 0.158242
97th percentile daily values = 11.5461
97th percentile 4 day average = 10.0581
97th percentile 30 day average= 9.16896
< Q.L. = 0
Model used = lognormal

No Limit is required for this material

The data are:

9.4
10
8.9
8.6
12.2
9.3
10.1
8.4
8.7
9.3
7.9
5.7
8.1
8.7
7.7
7.6
8.3
7.5

2/24/2014 3:18:35 PM

Facility = PFRWTA
Chemical = stream zinc in ug/L
Chronic averaging period = 4
WLAa =
WLAc =
Q.L. = 0.01
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 2
Expected Value = 3.675
Variance = 4.86202
C.V. = 0.6
97th percentile daily values = 8.94280
97th percentile 4 day average = 6.11442
97th percentile 30 day average= 4.43224
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

No Limit is required for this material

The data are:

5.93
1.42

2/26/2014 9:42:39 AM

Facility = PFRWTA
Chemical = ammonia (annual) 97% effluent in mg/L
Chronic averaging period = 30
WLAa = 43
WLAc = 10
Q.L. = 0.20
# samples/mo. = 30
# samples/wk. = 8

Summary of Statistics:

observations = 1
Expected Value = 4.10944
Variance = 6.07951
C.V. = 0.6
97th percentile daily values = 9.99999
97th percentile 4 day average = 6.83725
97th percentile 30 day average= 4.95621
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

No Limit is required for this material

The data are:

4.1094468

per spreadsheet instructions for non-limited parameters

2/26/2014 9:49:22 AM

Facility = PFRWTA
Chemical = ammonia (wet season, [illegible] effluent in mg/L
Chronic averaging period = 30
WLAa =
WLAc =
Q.L. = 0.04
# samples/mo. = 30
# samples/wk. = 8

Summary of Statistics:

observations = 3
Expected Value = .059534
Variance = .001275
C.V. = 0.6
97th percentile daily values = .144871
97th percentile 4 day average = .099052
97th percentile 30 day average= .071801
< Q.L. = 1
Model used = BPJ Assumptions, Type 1 data

No Limit is required for this material

The data are:

0
0.07
0.09

2/26/2014 9:54:44 AM

Facility = PFRWTA
Chemical = cadmium 97% effluent in ug/L
Chronic averaging period = 4
WLAa =
WLAc =
Q.L. = 0.2
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 3
Expected Value = .185549
Variance = .012394
C.V. = 0.6
97th percentile daily values = .451520
97th percentile 4 day average = .308715
97th percentile 30 day average= .223782
< Q.L. = 2
Model used = BPJ Assumptions, Type 1 data

No Limit is required for this material

The data are:

0
0
0.2

2/26/2014 9:57:14 AM

Facility = PFRWTA
Chemical = chromium 97% effluent in ug/L
Chronic averaging period = 4
WLAa =
WLAc =
Q.L. = 1.0
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 3
Expected Value = 14.1666
Variance = 72.25
C.V. = 0.6
97th percentile daily values = 34.4734
97th percentile 4 day average = 23.5703
97th percentile 30 day average= 17.0857
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

No Limit is required for this material

The data are:

7.8
26.7
8

2/26/2014 9:59:47 AM

Facility = PFRWTA
Chemical = copper 97% effluent in ug/L
Chronic averaging period = 4
WLAa =
WLAc =
Q.L. = 2.0
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 3
Expected Value = 5.2
Variance = 9.7344
C.V. = 0.6
97th percentile daily values = 12.6537
97th percentile 4 day average = 8.65170
97th percentile 30 day average= 6.27147
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

No Limit is required for this material

The data are:

5
5.3
5.3

2/26/2014 10:02:38 AM

Facility = PFRWTA
Chemical = nickel 97% effluent in ug/L
Chronic averaging period = 4
WLAa =
WLAc =
Q.L. = 2.0
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 3
Expected Value = 5.56666
Variance = 11.1556
C.V. = 0.6
97th percentile daily values = 13.5460
97th percentile 4 day average = 9.26176
97th percentile 30 day average= 6.71369
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

No Limit is required for this material

The data are:

4.5
6.7
5.5

2/26/2014 10:05:56 AM

Facility = PFRWTA
Chemical = nitrate 97% effluent in mg/L
Chronic averaging period = 4
WLAa =
WLAc =
Q.L. = 0.50
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 3
Expected Value = 15.9
Variance = 91.0116
C.V. = 0.6
97th percentile daily values = 38.6913
97th percentile 4 day average = 26.4542
97th percentile 30 day average= 19.1762
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

No Limit is required for this material

The data are:

14.2
16.5
17

2/26/2014 10:10:31 AM

Facility = PFRWTA
Chemical = phenol 97% effluent in ug/L
Chronic averaging period = 4
WLAa =
WLAc =
Q.L. = 5
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 12
Expected Value = 6.61494
Variance = 15.7527
C.V. = 0.6
97th percentile daily values = 16.0969
97th percentile 4 day average = 11.0058
97th percentile 30 day average= 7.97797
< Q.L. = 5
Model used = BPJ Assumptions, Type 1 data

No Limit is required for this material

The data are:

0
0
0
0
0
5
7
9
11
12
13
18

2/26/2014 10:13:59 AM

Facility = PFRWTA
Chemical = sulfate 97% effluent in mg/L
Chronic averaging period = 4
WLAa =
WLAc =
Q.L. = 1.0
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 3
Expected Value = 76.5666
Variance = 2110.48
C.V. = 0.6
97th percentile daily values = 186.318
97th percentile 4 day average = 127.390
97th percentile 30 day average= 92.3434
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

No Limit is required for this material

The data are:

76.8
89.4
63.5

2/26/2014 10:18:08 AM

Facility = PFRWTA
Chemical = total dissolved solids 97% effluent in ug/L
Chronic averaging period = 4
WLAa =
WLAc =
Q.L. = 5000
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 3
Expected Value = 634666.
Variance = 1450086
C.V. = 0.6
97th percentile daily values = 1544408
97th percentile 4 day average = 1055952
97th percentile 30 day average= 765441.
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

No Limit is required for this material

The data are:

605000
712000
587000

2/26/2014 10:21:11 AM

Facility = PFRWTA
Chemical = zinc 97% effluent in ug/L
Chronic averaging period = 4
WLAa =
WLAc =
Q.L. = 3.0
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 3
Expected Value = 35
Variance = 441
C.V. = 0.6
97th percentile daily values = 85.1696
97th percentile 4 day average = 58.2326
97th percentile 30 day average= 42.2118
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

No Limit is required for this material

The data are:

29.5
34.9
40.6

Tier 1 Stream - Issuance/Reissuance/Modification:

"Discharge-Stream Info" sheet:

Complete the blue character cells as appropriate.
IMPORTANT: If a new discharge is proposed to an intermittant stream (dry ditch), "Current Discharge Flow" must be entered as 0.000001 MGD, rather than 0 MGD.
Print

"WQS-WLA" sheet:

See instructions in rows 117-126.

Re-run both spreadsheets for each discharge flow tier.

Tier 2 Stream - I or R/M With Proposed Expansion:

"Discharge-Stream Info" sheet:

Complete the blue character cells as appropriate.
"1992 Discharge Flow" = Permitted discharge flow in 1992 (at WQS adoption)
Print

"WQS-WLA" sheet:

See instructions in rows 127-139.

Re-run both spreadsheets for each discharge flow tier.

Tier 2 Stream - R/M for facility that has expanded since 1992

"Discharge-Stream Info" sheet:

Complete the blue character cells as appropriate.
"1992 Discharge Flow" = Permitted discharge flow in 1992 (at WQS adoption)
Print

"WQS-WLA" sheet:

See the instructions in rows 140-152.

Re-run both spreadsheets for each discharge flow tier.

Tier 2 Stream - R/M for facility that has not expanded since 1992

"Discharge-Stream Info" sheet:

Complete the blue character cells as appropriate.
"1992 Discharge Flow" = Permitted discharge flow in 1992 (at WQS adoption)
Print

"WQS-WLA" sheet:

See the instructions in rows 153-165.

Re-run both spreadsheets for each discharge flow tier.

Expected Value of Upstream Data

Generated using the "Stats" program
Set both WLAa and WLAc equal to 0
Enter the QL as appropriate for the parameter
The Sampling Frequency and Ammonia question are irrelevant - enter/answer anything.
Enter the valid stream data

97th Percentiles of Effluent Data - Permit-Limited Parameter

Convert basis for existing limit (check previous FS) to Expected Value (EV)

Acute-based limit:	EV = 0.41094468 (WLAa)
Chronic-based Ammonia limit:	EV = 0.8291508 (WLAc)
Chronic-based non-Ammonia limit:	EV = 0.60103733 (WLAc)
TRC (Standard "1.0-2.0 mg/l" range in permit):	EV = 1.643779
(Note: WLAa = WLAc = 4.0)	
TRC ("Non-Detect" limit in permit):	EV = 0.41094
(Note: WLAa = WLAc = 0.1)	
D.O.-based limit:	EV = Monthly Avg. Conc.

Generate the 97th percentiles using the "Stats" program
Enter the WLAa and WLAc from the previous FS (or as given above for TRC)
Enter a QL < the EV
Enter/answer the Sampling Frequency and Ammonia question as appropriate
Enter the EV as the sole data point

Note: If "Stats" indicates that a limit is needed during the above analysis, slightly reduce the EV and repeat until no limit is triggered.

97th Percentiles of Effluent Data - Non-Limited Parameter

Generate using "Stats" program
Set both WLAa and WLAc equal to 0
Enter the QL as appropriate for the parameter
Enter/answer the Sampling Frequency and Ammonia question as appropriate
Enter the valid effluent data

WATER QUALITY CRITERIA / WASTE LOAD ALLOCATION ANALYSIS

Facility Name:
Pepper's Ferry Regional Wastewater Treatment Authority

Receiving Stream:
New River

Permit No.: VA0062685
Date: 4/9/2014

Version: OWP Guidance Memo 00-2011 (8/24/00)

Stream Information		
Mean Hardness (as CaCO3) =	78.7	mg/L
90% Temperature (Annual) =	22.9	deg C
90% Temperature (Wet season) =	16.6	deg C
90% Maximum pH =	8.3	SU
10% Maximum pH =	7.3	SU
Tier Designation =	2	
Public Water Supply (PWS) Y/N? =	Y	
V(alley) or P(iedmont)? =	V	
Trout Present Y/N? =	N	
Early Life Stages Present Y/N? =	Y	Y or N

Stream Flows		
1Q10 (Annual) =	436	MGD
7Q10 (Annual) =	546	MGD
30Q10 (Annual) =	633	MGD
1Q10 (Wet season) =	515	MGD
30Q10 (Wet season) =	1053	MGD
30Q5 =	712	MGD
Harmonic Mean =	1506	MGD

Mixing Information		
Annual	- 1Q10 Flow =	2.72 %
	- 7Q10 Flow =	100 %
	- 30Q10 Flow =	100 %
Wet Season	- 1Q10 Flow =	3.15 %
	- 30Q10 Flow =	100 %

Effluent Information		
Mean Hardness (as CaCO3) =	223	mg/L
90% Temp (Annual) =	23	deg C
90% Temp (Wet season) =	18	deg C
90% Maximum pH =	7.3	SU
10% Maximum pH =	6.9	SU
1992 Discharge Flow =	9.00000	MGD
Discharge Flow for Limit Analysis =	18.00000	MGD

Footnotes:

1. All concentrations expressed as micrograms/liter (ug/l), unless noted otherwise.
2. All flow values are expressed as Million Gallons per Day (MGD).
3. Discharge volumes are highest monthly average or 2C maximum for Industries and design flows for Municipals.
4. Hardness expressed as mg/l CaCO3. Standards calculated using Hardness values in the range of 25-400 mg/l CaCO3.
5. "Public Water Supply" protects for fish & water consumption. "Other Surface Waters" protects for fish consumption only.
6. Carcinogen "Y" indicates carcinogenic parameter.
7. Ammonia WQSs selected from separate tables, based on pH and temperature.
8. Metals measured as Dissolved, unless specified otherwise.
9. WLA = Waste Load Allocation (based on standards).
10. WLA = Waste Load Allocation (based on standards).
11. WLAs are based on mass balances (less background, if data exist).
12. Acute - 1 hour avg. concentration not to be exceeded more than 1/3 years.
13. Chronic - 4 day avg. concentration (30 day avg. for Ammonia) not to be exceeded more than 1/3 years.
14. Mass balances employ 1Q10 for Acute, 30Q10 for Chronic Ammonia, 7Q10 for Other Chronic, 30Q5 for Non-carcinogens, and Harmonic Mean for Carcinogens. Actual flows employed are a function of the mixing analysis and may be less than the actual flows.
15. Effluent Limitations are calculated elsewhere using the minimum WLA and EPA's statistical approach (Technical Support Document).

Facility Name: [illegible]
Permit No.: VA0002685
Receiving Stream: New River
Date: 4/9/2014

97th Percentiles of Effluent Concentrations / Expected Value of Upstream Data / Current Downstream Mix Concentrations

Toxic Parameter and Form	Carcinogen?	97th Percentiles of Effluent Concentrations: Daily	4-Day	30-Day	Expected Value of Upstream Data	Current Downstream Mix Concentrations: Acute	Chronic	H-Health
Acenaphthene	N	0	0	0	0	0	0	0
Acrolein	N	0	0	0	0	0	0	0
Acrylonitrile	Y	0	0	0	0	0	0	0
Aldrin	Y	0	0	0	0	0	0	0
Ammonia-N (Annual)	N	9.99999	6.83725	4.95621	0.043450	#######	#######	0.104774
Ammonia-N (Wet Season)	N	#######	######	#######	0.026252	#######	#######	0.026830
Anthracene	N	0	0	0	0	0	0	0
Antimony	N	0	0	0	0	0	0	0
Arsenic	N	0	0	0	0.345	#######	#######	0.000000
Barium	N	0	0	0	0	0	0	0
Benzene	Y	0	0	0	0	0	0	0
Benzidine	Y	0	0	0	0	0	0	0
Benzo(a)anthracene	Y	0	0	0	0	0	0	0
Benzo(a)pyrene	Y	0	0	0	0	0	0	0
Benzo(b)fluoranthene	Y	0	0	0	0	0	0	0
Benzo(k)fluoranthene	Y	0	0	0	0	0	0	0
Bis2-Chloroethyl Ether	Y	0	0	0	0	0	0	0
Bis2-Chloroisopropyl Ether	N	0	0	0	0	0	0	0
Bis2-Ethylhexyl Phthalate	Y	0	0	0	0	0	0	0
Bromoform	Y	0	0	0	0	0	0	0
Butyl Benzyl Phthalate	N	0	0	0	0	0	0	0
Cadmium	N	#######	######	#######	0	#######	#######	0.002793
Carbon Tetrachloride	Y	0	0	0	0	0	0	0
Chlordane	Y	0	0	0	0	0	0	0
Chloride	N	0	0	0	9.11698	8.93230	8.96884	9.00288
Chlorine, Total Residual	N	0	0	0	0	0	0	0
Chlorobenzene	N	0	0	0	0	0	0	0
Chlorodibromomethane	Y	0	0	0	0	0	0	0
Chloroform	N	0	0	0	0	0	0	0
2-Chloronaphthalene	N	0	0	0	0	0	0	0
2-Chlorophenol	N	0	0	0	0	0	0	0
Chlorpyrifos	N	0	0	0	0	0	0	0
Chromium (+3)	N	0	0	0	0	0	0	0
Chromium (+6)	N	0	0	0	0	0	0	0
Total Chromium	N	34.4734	23.5703	17.0857	0.18	0.87	0.56	0.39
Chrysene	Y	0	0	0	0	0	0	0
Copper	N	#######	8.65170	6.27147	0.645	0.888	0.775	0.715
Cyanide, Free	N	0	0	0	0	0	0	0
DDD	Y	0	0	0	0	0	0	0
DDE	Y	0	0	0	0	0	0	0
DDT	Y	0	0	0	0	0	0	0
Demeton	N	0	0	0	0	0	0	0
Diazinon	N	0	0	0	0	0	0	0
Dibenz(a,h)anthracene	Y	0	0	0	0	0	0	0
1,2-Dichlorobenzene	N	0	0	0	0	0	0	0
1,3-Dichlorobenzene	N	0	0	0	0	0	0	0
1,4-Dichlorobenzene	N	0	0	0	0	0	0	0
3,3-Dichlorobenzidine	Y	0	0	0	0	0	0	0
Dichlorobromomethane	Y	0	0	0	0	0	0	0
1,2-Dichloroethane	Y	0	0	0	0	0	0	0
1,1-Dichloroethylene	N	0	0	0	0	0	0	0
1,2-trans-dichloroethylene	N	0	0	0	0	0	0	0
2,4-Dichlorophenol	N	0	0	0	0	0	0	0
2,4-Dichlorophenoxy Acetic Acid	N	0	0	0	0	0	0	0
1,2-Dichloropropane	Y	0	0	0	0	0	0	0
1,3-Dichloropropene	Y	0	0	0	0	0	0	0
Dieldrin	Y	0	0	0	0	0	0	0
Diethyl Phthalate	N	0	0	0	0	0	0	0
2,4 Dimethylphenol	N	0	0	0	0	0	0	0
Dimethyl Phthalate	N	0	0	0	0	0	0	0
Di-n-Butyl Phthalate	N	0	0	0	0	0	0	0
2,4 Dinitrophenol	N	0	0	0	0	0	0	0
2-Methyl-4,6-Dinitrophenol	N	0	0	0	0	0	0	0
2,4-Dinitrotoluene	Y	0	0	0	0	0	0	0
Dioxin +	N	0	0	0	0	0	0	0
1,2-Diphenylhydrazine	Y	0	0	0	0	0	0	0
Alpha-Endosulfan	N	0	0	0	0	0	0	0
Beta-Endosulfan	N	0	0	0	0	0	0	0
Alpha+Beta-Endosulfan	N	0	0	0	0	0	0	0
Endosulfan Sulfate	N	0	0	0	0	0	0	0
Endrin	N	0	0	0	0	0	0	0
Endrin Aldehyde	N	0	0	0	0	0	0	0
Ethylbenzene	N	0	0	0	0	0	0	0
Fluoranthene	N	0	0	0	0	0	0	0
Fluorene	N	0	0	0	0	0	0	0
Foaming Agents (MBAS)	N	0	0	0	0	0	0	0
Guthion	N	0	0	0	0	0	0	0
Heptachlor	Y	0	0	0	0	0	0	0
Heptachlor Epoxide	Y	0	0	0	0	0	0	0
Hexachlorobenzene	Y	0	0	0	0	0	0	0
Hexachlorobutadiene	Y	0	0	0	0	0	0	0
Hexachlorocyclohexane Alpha-BH	Y	0	0	0	0	0	0	0
Hexachlorocyclohexane Beta-BHC	Y	0	0	0	0	0	0	0
Hexachlorocyclohexane Gamma-BHC (Lindane)	Y	0	0	0	0	0	0	0
Hexachlorocyclopentadiene	N	0	0	0	0	0	0	0
Hexachloroethane	Y	0	0	0	0	0	0	0
Hydrogen Sulfide	N	0	0	0	0	0	0	0
Indeno(1,2,3-cd)pyrene	Y	0	0	0	0	0	0	0
Iron	N	0	0	0	0	0	0	0
Isophorone	Y	0	0	0	0	0	0	0
Kepone	N	0	0	0	0	0	0	0
Lead	N	0	0	0	0	0	0	0
Malathion	N	0	0	0	0	0	0	0
Manganese	N	0	0	0	14.315	14.025	14.083	14.136
Mercury	N	0	0	0	0	0	0	0
Methyl Bromide	N	0	0	0	0	0	0	0
Methylene Chloride	Y	0	0	0	0	0	0	0
Methoxychlor	N	0	0	0	0	0	0	0
Mirex	N	0	0	0	0	0	0	0
Nickel	N	#######	9.26176	6.71369	0.385	0.651	0.529	0.464
Nitrate (as N)	N	38.6913	26.4542	19.1762	0.936187	1.6998	1.3500	1.1639
Nitrobenzene	N	0	0	0	0	0	0	0
N-Nitrosodimethylamine	Y	0	0	0	0	0	0	0
N-Nitrosodiphenylamine	Y	0	0	0	0	0	0	0
N-Nitrosodi-n-propylamine	Y	0	0	0	0	0	0	0
Nonylphenol	N	0	0	0	0	0	0	0
Parathion	N	0	0	0	0	0	0	0
PCB Total	Y	0	0	0	0	0	0	0
Pentachlorophenol	Y	0	0	0	0	0	0	0
Phenol	N	#######	######	7.97797	0	0.32556	0.17847	0.09959
Pyrene	N	0	0	0	0	0	0	0
RadNuc - Beta Part & Photon Act	N	0	0	0	0	0	0	0
RadNuc - Gross Alpha Part Act	N	0	0	0	0	0	0	0
RadNuc - Radium 226 + 228	N	0	0	0	0	0	0	0
RadNuc - Uranium	N	0	0	0	0	0	0	0
Selenium, Total Recoverable	N	0	0	0	0	0	0	0
Silver	N	0	0	0	0	0	0	0
Sulfate	N	186.318	127.390	92.3434	8.69636	12.289	10.621	9.740
1,1,2,2-Tetrachloroethane	Y	0	0	0	0	0	0	0
Tetrachloroethylene	Y	0	0	0	0	0	0	0
Thallium	N	0	0	0	0	0	0	0
Toluene	N	0	0	0	0	0	0	0
Total Dissolved Solids	N	1544408	######	765441	0	31235	17124	9555
Toxaphene	Y	0	0	0	0	0	0	0
Tributyltin	N	0	0	0	0	0	0	0
1,2,4-Trichlorobenzene	N	0	0	0	0	0	0	0
1,1,2-Trichloroethane	Y	0	0	0	0	0	0	0
Trichloroethylene	Y	0	0	0	0	0	0	0
2,4,6-Trichlorophenol	Y	0	0	0	0	0	0	0
2-(2,4,5-Trichlorophenoxy propionic acid (Silvex)	N	0	0	0	0	0	0	0
Vinyl Chloride	Y	0	0	0	0	0	0	0
Zinc	N	85.1696	58.2326	42.2118	3.675	5.323	4.560	4.156

PRE - EXPANSION WATER QUALITY CRITERIA (9.000 MGD Discharge Flow - 100% Stream Mix) / **INSTREAM BASELINES**

Toxic Parameter and Form	Pre-Expansion Aquatic Protection: Acute	Chronic	Human Health: Public Water Supplies	Other Surface Waters	Instream Baselines: Acute	Chronic	H-Health
Acenaphthene	None	None	6.7E+02	9.9E+02	None	None	6.7E+01
Acrolein	None	None	6.1E+00	9.3E+00	None	None	6.1E-01
Acrylonitrile	None	None	5.1E-01	2.5E+00	None	None	5.1E-02
Aldrin	3.0E+00	None	4.9E-04	5.0E-04	7.5E-01	None	4.9E-05
Ammonia-N (Annual)	5.4E+00 mg/L	9.7E-01 mg/L	None	None	1.5E+00 mg/L	3.3E-01 mg/L	None
Ammonia-N (Wet Season)	5.3E+00 mg/L	1.4E+00 mg/L	None	None	1.4E+00 mg/L	3.7E-01 mg/L	None
Anthracene	None	None	8.3E+03	4.0E+04	None	None	8.3E+02
Antimony	None	None	5.6E+00	6.4E+02	None	None	5.6E-01
Arsenic	3.4E+02	1.5E+02	1.0E+01	None	8.5E+01	3.8E+01	1.0E+00
Barium	None	None	2.0E+03	None	None	None	2.0E+02
Benzene	None	None	2.2E+01	5.1E+02	None	None	2.2E+00
Benzidine	None	None	8.6E-04	2.0E-03	None	None	8.6E-05
Benzo(a)anthracene	None	None	3.8E-02	1.8E-01	None	None	3.8E-03
Benzo(a)pyrene	None	None	3.8E-02	1.8E-01	None	None	3.8E-03
Benzo(b)fluoranthene	None	None	3.8E-02	1.8E-01	None	None	3.8E-03
Benzo(k)fluoranthene	None	None	3.8E-02	1.8E-01	None	None	3.8E-03
Bis2-Chloroethyl Ether	None	None	3.0E-01	5.3E+00	None	None	3.0E-02
Bis2-Chloroisopropyl Ether	None	None	1.4E+03	6.5E+04	None	None	1.4E+02
Bis2-Ethylhexyl Phthalate	None	None	1.2E+01	2.2E+01	None	None	1.2E+00
Bromoform	None	None	4.3E+01	1.4E+03	None	None	4.3E+00
Butyl Benzyl Phthalate	None	None	1.5E+03	1.9E+03	None	None	1.5E+02
Cadmium	3.1E+00	9.6E-01	5.0E+00	None	7.9E-01	2.4E-01	5.0E-01
Carbon Tetrachloride	None	None	2.3E+00	1.6E+01	None	None	2.3E-01
Chlordane	2.4E+00	4.3E-03	8.0E-03	8.1E-03	6.0E-01	1.1E-03	8.0E-04
Chloride	8.6E+02 mg/L	2.3E+02 mg/L	2.5E+02 mg/L	None	2.2E+02 mg/L	6.4E+01 mg/L	3.3E+01 mg/L
Chlorine, Total Residual	1.9E-02 mg/L	1.1E-02 mg/L	None	None	4.8E-03 mg/L	2.8E-03 mg/L	None
Chlorobenzene	None	None	1.3E+02	1.6E+03	None	None	1.3E+01
Chlorodibromomethane	None	None	4.0E+00	1.3E+02	None	None	4.0E-01
Chloroform	None	None	3.4E+02	1.1E+04	None	None	3.4E+01
2-Chloronaphthalene	None	None	1.0E+03	1.6E+03	None	None	1.0E+02
2-Chlorophenol	None	None	8.1E+01	1.5E+02	None	None	8.1E+00
Chlorpyrifos	8.3E-02	4.1E-02	None	None	2.1E-02	1.0E-02	None
Chromium (+3)	4.6E+02	6.2E+01	None	None	1.2E+02	1.6E+01	None
Chromium (+6)	1.6E+01	1.1E+01	None	None	4.0E+00	2.8E+00	None
Total Chromium	None	None	1.0E+02	None	None	None	1.0E+01
Chrysene	None	None	3.8E-03	1.8E-02	None	None	3.8E-04
Copper	1.1E+01	7.5E+00	1.3E+03	None	3.4E+00	2.5E+00	1.3E+02
Cyanide, Free	2.2E+01	5.2E+00	1.4E+02	1.6E+04	5.5E+00	1.3E+00	1.4E+01
DDD	None	None	3.1E-03	3.1E-03	None	None	3.1E-04
DDE	None	None	2.2E-03	2.2E-03	None	None	2.2E-04
DDT	1.1E+00	1.0E-03	2.2E-03	2.2E-03	2.8E-01	2.5E-04	2.2E-04
Demeton	None	1.0E-01	None	None	None	2.5E-02	None
Diazinon	1.7E-01	1.7E-01	None	None	4.3E-02	4.3E-02	None
Dibenz(a,h)anthracene	None	None	3.8E-02	1.8E-01	None	None	3.8E-03
1,2-Dichlorobenzene	None	None	4.2E+02	1.3E+03	None	None	4.2E+01
1,3-Dichlorobenzene	None	None	3.2E+02	9.6E+02	None	None	3.2E+01
1,4-Dichlorobenzene	None	None	6.3E+01	1.9E+02	None	None	6.3E+00
3,3-Dichlorobenzidine	None	None	2.1E-01	2.8E-01	None	None	2.1E-02
Dichlorobromomethane	None	None	5.5E+00	1.7E+02	None	None	5.5E-01
1,2-Dichloroethane	None	None	3.8E+00	3.7E+02	None	None	3.8E-01
1,1-Dichloroethylene	None	None	3.3E+02	7.1E+03	None	None	3.3E+01
1,2-trans-dichloroethylene	None	None	1.4E+02	1.0E+04	None	None	1.4E+01
2,4-Dichlorophenol	None	None	7.7E+01	2.9E+02	None	None	7.7E+00
2,4-Dichlorophenoxy Acetic Acid	None	None	1.0E+02	None	None	None	1.0E+01
1,2-Dichloropropane	None	None	5.0E+00	1.5E+02	None	None	5.0E-01
1,3-Dichloropropene	None	None	3.4E+00	2.1E+02	None	None	3.4E-01
Dieldrin	2.4E-01	5.6E-02	5.2E-04	5.4E-04	6.0E-02	1.4E-02	5.2E-05
Diethyl Phthalate	None	None	1.7E+04	4.4E+04	None	None	1.7E+03
2,4 Dimethylphenol	None	None	3.8E+02	8.5E+02	None	None	3.8E+01
Dimethyl Phthalate	None	None	2.7E+05	1.1E+06	None	None	2.7E+04
Di-n-Butyl Phthalate	None	None	2.0E+03	4.5E+03	None	None	2.0E+02
2,4 Dinitrophenol	None	None	6.9E+01	5.3E+03	None	None	6.9E+00
2-Methyl-4,6-Dinitrophenol	None	None	1.3E+01	2.8E+02	None	None	1.3E+00
2,4-Dinitrotoluene	None	None	1.1E+00	3.4E+01	None	None	1.1E-01
Dioxin +	None	None	5.0E-08	5.1E-08	None	None	5.0E-09
1,2-Diphenylhydrazine	None	None	3.6E-01	2.0E+00	None	None	3.6E-02
Alpha-Endosulfan	2.2E-01	5.6E-02	6.2E+01	8.9E+01	5.5E-02	1.4E-02	6.2E+00
Beta-Endosulfan	2.2E-01	5.6E-02	6.2E+01	8.9E+01	5.5E-02	1.4E-02	6.2E+00
Alpha+Beta-Endosulfan	2.2E-01	5.6E-02	None	None	5.5E-02	1.4E-02	None
Endosulfan Sulfate	None	None	6.2E+01	8.9E+01	None	None	6.2E+00
Endrin	8.6E-02	3.6E-02	5.9E-02	6.0E-02	2.2E-02	9.0E-03	5.9E-03
Endrin Aldehyde	None	None	2.9E-01	3.0E-01	None	None	2.9E-02
Ethylbenzene	None	None	5.3E+02	2.1E+03	None	None	5.3E+01
Fluoranthene	None	None	1.3E+02	1.4E+02	None	None	1.3E+01
Fluorene	None	None	1.1E+03	5.3E+03	None	None	1.1E+02
Foaming Agents (MBAS)	None	None	5.0E+02	None	None	None	5.0E+01
Guthion	None	1.0E-02	None	None	None	2.5E-03	None
Heptachlor	5.2E-01	3.8E-03	7.9E-04	7.9E-04	1.3E-01	9.5E-04	7.9E-05
Heptachlor Epoxide	5.2E-01	3.8E-03	3.9E-04	3.9E-04	1.3E-01	9.5E-04	3.9E-05
Hexachlorobenzene	None	None	2.8E-03	2.9E-03	None	None	2.8E-04
Hexachlorobutadiene	None	None	4.4E+00	1.8E+02	None	None	4.4E-01
Hexachlorocyclohexane Alpha-BH	None	None	2.6E-02	4.9E-02	None	None	2.6E-03
Hexachlorocyclohexane Beta-BHC	None	None	9.1E-02	1.7E-01	None	None	9.1E-03
Hexachlorocyclohexane Gamma-BHC (Lindane)	9.5E-01	None	9.8E-01	1.8E+00	2.4E-01	None	9.8E-02
Hexachlorocyclopentadiene	None	None	4.0E+01	1.1E+03	None	None	4.0E+00
Hexachloroethane	None	None	1.4E+01	3.3E+01	None	None	1.4E+00
Hydrogen Sulfide	None	2.0E+00	None	None	None	5.0E-01	None
Indeno(1,2,3-cd)pyrene	None	None	3.8E-02	1.8E-01	None	None	3.8E-03
Iron	None	None	3.0E+02	None	None	None	3.0E+01
Isophorone	None	None	3.5E+02	9.6E+03	None	None	3.5E+01
Kepone	None	Zero	None	None	None	Zero	None
Lead	9.2E+01	1.0E+01	1.5E+01	None	2.3E+01	2.6E+00	1.5E+00
Malathion	None	1.0E-01	None	None	None	2.5E-02	None
Manganese	None	None	5.0E+01	None	None	None	1.8E+01
Mercury	1.4E+00	7.7E-01	None	None	3.5E-01	1.9E-01	None
Methyl Bromide	None	None	4.7E+01	1.5E+03	None	None	4.7E+00
Methylene Chloride	None	None	4.6E+01	5.9E+03	None	None	4.6E+00
Methoxychlor	None	3.0E-02	1.0E+02	None	None	7.5E-03	1.0E+01
Mirex	None	Zero	None	None	None	Zero	None
Nickel	1.5E+02	1.7E+01	6.1E+02	4.6E+03	3.9E+01	4.6E+00	6.1E+01
Nitrate (as N)	None	None	1.0E+01 mg/L	None	None	None	2.0E+00 mg/L
Nitrobenzene	None	None	1.7E+01	6.9E+02	None	None	1.7E+00
N-Nitrosodimethylamine	None	None	6.9E-03	3.0E+01	None	None	6.9E-04
N-Nitrosodiphenylamine	None	None	3.3E+01	6.0E+01	None	None	3.3E+00
N-Nitrosodi-n-propylamine	None	None	5.0E-02	5.1E+00	None	None	5.0E-03
Nonylphenol	2.8E+01	6.6E+00	None	None	7.0E+00	1.7E+00	None
Parathion	6.5E-02	1.3E-02	None	None	1.6E-02	3.3E-03	None
PCB Total	None	1.4E-02	6.4E-04	6.4E-04	None	3.5E-03	6.4E-05
Pentachlorophenol	1.2E+01	9.0E+00	2.7E+00	3.0E+01	2.9E+00	2.2E+00	2.7E-01
Phenol	None	None	1.0E+04	8.6E+05	None	None	1.0E+03
Pyrene	None	None	8.3E+02	4.0E+03	None	None	8.3E+01
RadNuc - Beta Part & Photon Act	None	None	4.0E+00 mrem	None	None	None	4.0E-01 mrem
RadNuc - Gross Alpha Part Act	None	None	1.5E+01 pCi/L	None	None	None	1.5E+00 pCi/L
RadNuc - Radium 226 + 228	None	None	5.0E+00 pCi/L	None	None	None	5.0E-01 pCi/L
RadNuc - Uranium	None	None	3.0E+01	None	None	None	3.0E+00
Selenium, Total Recoverable	2.0E+01	5.0E+00	1.7E+02	4.2E+03	5.0E+00	1.3E+00	1.7E+01
Silver	2.4E+00	None	None	None	6.1E-01	None	None
Sulfate	None	None	2.5E+02 mg/L	None	None	None	3.4E+01 mg/L
1,1,2,2-Tetrachloroethane	None	None	1.7E+00	4.0E+01	None	None	1.7E-01
Tetrachloroethylene	None	None	6.9E+00	3.3E+01	None	None	6.9E-01
Thallium	None	None	2.4E-01	4.7E-01	None	None	2.4E-02
Toluene	None	None	5.1E+02	6.0E+03	None	None	5.1E+01
Total Dissolved Solids	None	None	5.0E+05	None	None	None	5.9E+04
Toxaphene	7.3E-01	2.0E-04	2.8E-03	2.8E-03	1.8E-01	5.0E-05	2.8E-04
Tributyltin	4.6E-01	7.2E-02	None	None	1.2E-01	1.8E-02	None
1,2,4-Trichlorobenzene	None	None	3.5E+01	7.0E+01	None	None	3.5E+00
1,1,2-Trichloroethane	None	None	5.9E+00	1.6E+02	None	None	5.9E-01
Trichloroethylene	None	None	2.5E+01	3.0E+02	None	None	2.5E+00
2,4,6-Trichlorophenol	None	None	1.4E+01	2.4E+01	None	None	1.4E+00
2-(2,4,5-Trichlorophenoxy propionic acid (Silvex)	None	None	5.0E+01	None	None	None	5.0E+00
Vinyl Chloride	None	None	2.5E-01	2.4E+01	None	None	2.5E-02
Zinc	9.9E+01	9.9E+01	7.4E+03	2.6E+04	2.9E+01	2.8E+01	7.4E+02

ANTIDEGRADATION WASTE LOAD ALLOCATIONS (18.000 MGD Discharge - 100% Stream Mix) / **POST - EXPANSION WATER QUALITY CRITERIA** (18.000 MGD Discharge Flow - Mix per "Mixer")

Toxic Parameter and Form	Antidegradation Aquatic Protection: Acute	Chronic	Human Health	Post-Expansion Aquatic Protection: Acute	Chronic	Human Health: Public Water Supplies	Other Surface Waters
Acenaphthene	N/A	N/A	2.7E+03	None	None	6.7E+02	9.9E+02
Acrolein	N/A	N/A	2.5E+01	None	None	6.1E+00	9.3E+00
Acrylonitrile	N/A	N/A	4.3E+00	None	None	5.1E-01	2.5E+00
Aldrin	1.9E+01	N/A	4.1E-03	3.0E+00	None	4.9E-04	5.0E-04
Ammonia-N (Annual)	3.8E+01 mg/L	1.0E+01 mg/L	N/A	2.0E+01 mg/L	###### mg/L	None	None
Ammonia-N (Wet Season)	3.9E+01 mg/L	2.1E+01 mg/L	N/A	1.9E+01 mg/L	###### mg/L	None	None
Anthracene	N/A	N/A	3.4E+04	None	None	8.3E+03	4.0E+04
Antimony	N/A	N/A	2.3E+01	None	None	5.6E+00	6.4E+02
Arsenic	2.1E+03	1.2E+03	4.1E+01	3.4E+02	######	1.0E+01	None
Barium	N/A	N/A	8.1E+03	None	None	2.0E+03	None
Benzene	N/A	N/A	1.9E+02	None	None	2.2E+01	5.1E+02
Benzidine	N/A	N/A	7.3E-03	None	None	8.6E-04	2.0E-03
Benzo(a)anthracene	N/A	N/A	3.2E-01	None	None	3.8E-02	1.8E-01
Benzo(a)pyrene	N/A	N/A	3.2E-01	None	None	3.8E-02	1.8E-01
Benzo(b)fluoranthene	N/A	N/A	3.2E-01	None	None	3.8E-02	1.8E-01
Benzo(k)fluoranthene	N/A	N/A	3.2E-01	None	None	3.8E-02	1.8E-01
Bis2-Chloroethyl Ether	N/A	N/A	2.5E+00	None	None	3.0E-01	5.3E+00
Bis2-Chloroisopropyl Ether	N/A	N/A	5.7E+03	None	None	1.4E+03	6.5E+04
Bis2-Ethylhexyl Phthalate	N/A	N/A	1.0E+02	None	None	1.2E+01	2.2E+01
Bromoform	N/A	N/A	3.6E+02	None	None	4.3E+01	1.4E+03
Butyl Benzyl Phthalate	N/A	N/A	6.1E+03	None	None	1.5E+03	1.9E+03
Cadmium	2.0E+01	7.7E+00	2.0E+01	6.9E+00	9.8E-01	5.0E+00	None
Carbon Tetrachloride	N/A	N/A	1.9E+01	None	None	2.3E+00	1.6E+01
Chlordane	1.5E+01	3.4E-02	6.8E-02	2.4E+00	4.3E-03	8.0E-03	8.1E-03
Chloride	5.4E+03 mg/L	1.7E+03 mg/L	9.8E+02 mg/L	8.6E+02 mg/L	###### mg/L	2.5E+02 mg/L	None
Chlorine, Total Residual	1.2E-01 mg/L	8.6E-02 mg/L	N/A	1.9E-02 mg/L	1.1E-02 mg/L	None	None
Chlorobenzene	N/A	N/A	5.3E+02	None	None	1.3E+02	1.6E+03
Chlorodibromomethane	N/A	N/A	3.4E+01	None	None	4.0E+00	1.3E+02
Chloroform	N/A	N/A	1.4E+03	None	None	3.4E+02	1.1E+04
2-Chloronaphthalene	N/A	N/A	4.1E+03	None	None	1.0E+03	1.6E+03
2-Chlorophenol	N/A	N/A	3.3E+02	None	None	8.1E+01	1.5E+02
Chlorpyrifos	5.2E-01	3.2E-01	N/A	8.3E-02	4.1E-02	None	None
Chromium (+3)	3.0E+03	4.9E+02	N/A	4.6E+02	######	None	None
Chromium (+6)	1.0E+02	8.6E+01	N/A	1.6E+01	######	None	None
Total Chromium	N/A	N/A	4.1E+02	None	None	1.0E+02	None
Chrysene	N/A	N/A	3.2E-02	None	None	4.4E-02	4.9E-01
Copper	7.1E+01	5.7E+01	5.3E+03	2.2E+01	######	1.3E+03	None
Cyanide, Free	1.4E+02	4.1E+01	5.7E+02	2.2E+01	######	1.4E+02	1.6E+04
DDD	N/A	N/A	2.6E-02	None	None	3.1E-03	3.1E-03
DDE	N/A	N/A	1.9E-02	None	None	2.2E-03	2.2E-03
DDT	6.9E+00	7.8E-03	1.9E-02	1.1E+00	1.0E-03	2.2E-03	2.2E-03
Demeton	N/A	7.8E-01	N/A	None	1.0E-01	None	None
Diazinon	1.1E+00	1.3E+00	N/A	1.7E-01	1.7E-01	None	None
Dibenz(a,h)anthracene	N/A	N/A	3.2E-01	None	None	3.8E-02	1.8E-01
1,2-Dichlorobenzene	N/A	N/A	1.7E+03	None	None	4.2E+02	1.3E+03
1,3-Dichlorobenzene	N/A	N/A	1.3E+03	None	None	3.2E+02	9.6E+02
1,4-Dichlorobenzene	N/A	N/A	2.6E+02	None	None	6.3E+01	1.9E+02
3,3-Dichlorobenzidine	N/A	N/A	1.8E+00	None	None	2.1E-01	2.8E-01
Dichlorobromomethane	N/A	N/A	4.7E+01	None	None	5.5E+00	1.7E+02
1,2-Dichloroethane	N/A	N/A	3.2E+01	None	None	3.8E+00	3.7E+02
1,1-Dichloroethylene	N/A	N/A	1.3E+03	None	None	3.3E+02	7.1E+03
1,2-trans-dichloroethylene	N/A	N/A	5.7E+02	None	None	1.4E+02	1.0E+04
2,4-Dichlorophenol	N/A	N/A	3.1E+02	None	None	7.7E+01	2.9E+02
2,4-Dichlorophenoxy Acetic Acid	N/A	N/A	4.1E+02	None	None	1.0E+02	None
1,2-Dichloropropane	N/A	N/A	4.2E+01	None	None	5.0E+00	1.5E+02
1,3-Dichloropropene	N/A	N/A	2.9E+01	None	None	3.4E+00	2.1E+02
Dieldrin	1.5E+00	4.4E-01	4.4E-03	2.4E-01	5.6E-02	5.2E-04	5.4E-04
Diethyl Phthalate	N/A	N/A	6.9E+04	None	None	1.7E+04	4.4E+04
2,4 Dimethylphenol	N/A	N/A	1.5E+03	None	None	3.8E+02	8.5E+02
Dimethyl Phthalate	N/A	N/A	1.1E+06	None	None	2.7E+05	1.1E+06
Di-n-Butyl Phthalate	N/A	N/A	8.1E+03	None	None	2.0E+03	4.5E+03
2,4 Dinitrophenol	N/A	N/A	2.6E+02	None	None	6.9E+01	5.3E+03
2-Methyl-4,6-Dinitrophenol	N/A	N/A	5.3E+01	None	None	1.3E+01	2.8E+02
2,4-Dinitrotoluene	N/A	N/A	9.3E+00	None	None	1.1E+00	3.4E+01
Dioxin +	N/A	N/A	2.0E-07	None	None	5.0E-08	5.1E-08
1,2-Diphenylhydrazine	N/A	N/A	3.0E+00	None	None	3.6E-01	2.0E+00
Alpha-Endosulfan	1.4E+00	4.4E-01	2.5E+02	2.2E-01	5.6E-02	6.2E+01	8.9E+01
Beta-Endosulfan	1.4E+00	4.4E-01	2.5E+02	2.2E-01	5.6E-02	6.2E+01	8.9E+01
Alpha+Beta-Endosulfan	1.4E+00	4.4E-01	N/A	2.2E-01	5.6E-02	None	None
Endosulfan Sulfate	N/A	N/A	2.5E+02	None	None	6.2E+01	8.9E+01
Endrin	5.4E-01	2.8E-01	2.4E-01	8.6E-02	3.6E-02	5.9E-02	6.0E-02
Endrin Aldehyde	N/A	N/A	1.2E+00	None	None	2.9E-01	3.0E-01
Ethylbenzene	N/A	N/A	2.1E+03	None	None	5.3E+02	2.1E+03
Fluoranthene	N/A	N/A	5.3E+02	None	None	1.3E+02	1.4E+02
Fluorene	N/A	N/A	4.5E+03	None	None	1.1E+03	5.3E+03
Foaming Agents (MBAS)	N/A	N/A	2.0E+03	None	None	5.0E+02	None
Guthion	N/A	7.8E-02	N/A	None	1.0E-02	None	None
Heptachlor	3.3E+00	3.0E-02	6.7E-03	5.2E-01	3.8E-03	7.9E-04	7.9E-04
Heptachlor Epoxide	3.3E+00	3.0E-02	3.3E-03	5.2E-01	3.8E-03	3.9E-04	3.9E-04
Hexachlorobenzene	N/A	N/A	2.4E-02	None	None	2.8E-03	2.9E-03
Hexachlorobutadiene	N/A	N/A	3.7E+01	None	None	4.4E+00	1.8E+02
Hexachlorocyclohexane Alpha-BH	N/A	N/A	2.2E-01	None	None	2.6E-02	4.9E-02
Hexachlorocyclohexane Beta-BHC	N/A	N/A	7.7E-01	None	None	9.1E-02	1.7E-01
Hexachlorocyclohexane Gamma-BHC (Lindane)	6.0E+00	N/A	8.3E+00	9.5E-01	None	9.8E-01	1.8E+00
Hexachlorocyclopentadiene	N/A	N/A	1.6E+02	None	None	4.0E+01	1.1E+03
Hexachloroethane	N/A	N/A	1.2E+02	None	None	1.4E+01	3.3E+01
Hydrogen Sulfide	N/A	1.6E+01	N/A	None	######	None	None
Indeno(1,2,3-cd)pyrene	N/A	N/A	3.2E-01	None	None	3.8E-02	1.8E-01
Iron	N/A	N/A	1.2E+03	None	None	3.0E+02	None
Isophorone	N/A	N/A	3.0E+03	None	None	3.5E+02	9.6E+03
Kepone	N/A	Zero	N/A	None	Zero	None	None
Lead	5.8E+02	8.1E+01	6.1E+01	2.3E+02	######	1.5E+01	None
Malathion	N/A	7.8E-01	N/A	None	1.0E-01	None	None
Manganese	N/A	N/A	1.5E+02	None	None	5.0E+01	None
Mercury	8.6E+00	6.0E+00	N/A	1.4E+00	7.7E-01	None	None
Methyl Bromide	N/A	N/A	1.9E+02	None	None	4.7E+01	1.5E+03
Methylene Chloride	N/A	N/A	3.9E+02	None	None	4.6E+01	5.9E+03
Methoxychlor	N/A	2.4E-01	4.1E+02	None	3.0E-02	1.0E+02	None
Mirex	N/A	Zero	N/A	None	Zero	None	None
Nickel	9.7E+02	1.3E+02	2.5E+03	2.8E+02	######	6.1E+02	4.6E+03
Nitrate (as N)	N/A	N/A	4.6E+01 mg/L	None	None	1.0E+01 mg/L	None
Nitrobenzene	N/A	N/A	6.9E+01	None	None	1.7E+01	6.9E+02
N-Nitrosodimethylamine	N/A	N/A	5.8E-02	None	None	6.9E-03	3.0E+01
N-Nitrosodiphenylamine	N/A	N/A	2.8E+02	None	None	3.3E+01	6.0E+01
N-Nitrosodi-n-propylamine	N/A	N/A	4.2E-01	None	None	5.0E-02	5.1E+00
Nonylphenol	1.6E+02	5.2E+01	N/A	2.8E+01	######	None	None
Parathion	4.1E-01	1.0E-01	N/A	6.5E-02	1.3E-02	None	None
PCB Total	N/A	1.1E-01	5.4E-03	None	1.4E-02	6.4E-04	6.4E-04
Pentachlorophenol	7.3E+01	7.0E+01	2.3E+01	8.9E+00	######	2.7E+00	3.0E+01
Phenol	N/A	N/A	4.1E+04	None	None	1.0E+04	8.6E+05
Pyrene	N/A	N/A	3.4E+03	None	None	8.3E+02	4.0E+03
RadNuc - Beta Part & Photon Act	N/A	N/A	1.6E+01 mrem	None	None	4.0E+00 mrem	4.0E+00 mrem
RadNuc - Gross Alpha Part Act	N/A	N/A	6.1E+01 pCi/L	None	None	1.5E+01 pCi/L	None
RadNuc - Radium 226 + 228	N/A	N/A	2.0E+01 pCi/L	None	None	5.0E+00 pCi/L	None
RadNuc - Uranium	N/A	N/A	1.2E+02	None	None	3.0E+01	None
Selenium, Total Recoverable	1.3E+02	3.9E+01	6.9E+02	2.0E+01	######	1.7E+02	4.2E+03
Silver	1.5E+01	N/A	N/A	8.2E+00	None	None	None
Sulfate	N/A	N/A	1.0E+03 mg/L	None	None	2.5E+02 mg/L	None
1,1,2,2-Tetrachloroethane	N/A	N/A	1.4E+01	None	None	1.7E+00	4.0E+01
Tetrachloroethylene	N/A	N/A	5.8E+01		None	6.9E+00	3.3E+01
Thallium	N/A	N/A	9.7E-01	None	None	2.4E-01	4.7E-01
Toluene	N/A	N/A	2.1E+03	None	None	5.1E+02	6.0E+03
Total Dissolved Solids	N/A	N/A	2.4E+06	None	None	5.0E+05	None
Toxaphene	4.6E+00	1.6E-03	2.4E-02	7.3E-01	2.0E-04	2.8E-03	2.8E-03
Tributyltin	2.9E+00	5.6E-01	N/A	4.6E-01	7.2E-02	None	None
1,2,4-Trichlorobenzene	N/A	N/A	1.4E+02	None	None	3.5E+01	7.0E+01
1,1,2-Trichloroethane	N/A	N/A	5.0E+01	None	None	5.9E+00	1.6E+02
Trichloroethylene	N/A	N/A	2.1E+02	None	None	2.5E+01	3.0E+02
2,4,6-Trichlorophenol	N/A	N/A	1.2E+02	None	None	1.4E+01	2.4E+01
2-(2,4,5-Trichlorophenoxy propionic acid (Silvex)	N/A	N/A	2.0E+02	None	None	5.0E+01	None
Vinyl Chloride	N/A	N/A	2.1E+00	None	None	2.5E-01	2.4E+01
Zinc	6.3E+02	7.7E+02	3.0E+04	1.8E+02	######	7.4E+03	2.6E+04

NON-ANTIDEGRADATION WASTE LOAD ALLOCATIONS (18.000 MGD Discharge - Mix per "Mixer") / **Target Level** / **MOST RESTRICTIVE WASTE LOAD ALLOCATIONS** (18.000 MGD Discharge Flow)

Toxic Parameter and Form	Non-Antidegradation Aquatic Protection: Acute	Chronic	Human Health	Target Level	Most Restrictive Aquatic Protection: Acute	Chronic	Human Health
Acenaphthene	N/A	N/A	2.7E+04	N/A	N/A	N/A	2.7E+03
Acrolein	N/A	N/A	2.5E+02	N/A	N/A	N/A	2.5E+01
Acrylonitrile	N/A	N/A	4.3E+01	N/A	N/A	N/A	4.3E+00
Aldrin	5.0E+00	N/A	4.1E-02	N/A	5.0E+00	N/A	4.1E-03
Ammonia-N (Annual)	3.3E+01 mg/L	3.6E+01 mg/L	N/A	N/A	3.3E+01 mg/L	1.0E+01 mg/L	N/A
Ammonia-N (Wet Season)	3.5E+01 mg/L	8.6E+01 mg/L	N/A	N/A	3.5E+01 mg/L	2.1E+01 mg/L	N/A
Anthracene	N/A	N/A	3.4E+05	N/A	N/A	N/A	3.4E+04
Antimony	N/A	N/A	2.3E+02	2.3E+02	N/A	N/A	2.3E+01
Arsenic	5.6E+02	4.7E+03	4.1E+02	2.3E+02	5.6E+02	1.2E+03	4.1E+01
Barium	N/A	N/A	8.1E+04	8.1E+04	N/A	N/A	8.1E+03
Benzene	N/A	N/A	1.9E+03	N/A	N/A	N/A	1.9E+02
Benzidine	N/A	N/A	7.3E-02	N/A	N/A	N/A	7.3E-03
Benzo(a)anthracene	N/A	N/A	3.2E+00	N/A	N/A	N/A	3.2E-01
Benzo(a)pyrene	N/A	N/A	3.2E+00	N/A	N/A	N/A	3.2E-01
Benzo(b)fluoranthene	N/A	N/A	3.2E+00	N/A	N/A	N/A	3.2E-01
Benzo(k)fluoranthene	N/A	N/A	3.2E+00	N/A	N/A	N/A	3.2E-01
Bis2-Chloroethyl Ether	N/A	N/A	2.5E+01	N/A	N/A	N/A	2.5E+00
Bis2-Chloroisopropyl Ether	N/A	N/A	5.7E+04	N/A	N/A	N/A	5.7E+03
Bis2-Ethylhexyl Phthalate	N/A	N/A	1.0E+03	N/A	N/A	N/A	1.0E+02
Bromoform	N/A	N/A	3.6E+03	N/A	N/A	N/A	3.6E+02
Butyl Benzyl Phthalate	N/A	N/A	6.1E+04	N/A	N/A	N/A	6.1E+03
Cadmium	1.1E+01	3.1E+01	2.0E+02	4.6E+00	1.1E+01	7.7E+00	2.0E+01
Carbon Tetrachloride	N/A	N/A	1.9E+02	N/A	N/A	N/A	1.9E+01
Chlordane	4.0E+00	1.3E-01	6.8E-01	N/A	4.0E+00	3.4E-02	6.8E-02
Chloride	1.4E+03 mg/L	6.9E+03 mg/L	9.8E+03 mg/L	N/A	1.4E+03 mg/L	1.7E+03 mg/L	9.8E+02 mg/L
Chlorine, Total Residual	3.2E-02 mg/L	3.4E-01 mg/L	N/A	N/A	3.2E-02 mg/L	8.6E-02 mg/L	N/A
Chlorobenzene	N/A	N/A	5.3E+03	N/A	N/A	N/A	5.3E+02
Chlorodibromomethane	N/A	N/A	3.4E+02	N/A	N/A	N/A	3.4E+01
Chloroform	N/A	N/A	1.4E+04	N/A	N/A	N/A	1.4E+03
2-Chloronaphthalene	N/A	N/A	4.1E+04	N/A	N/A	N/A	4.1E+03
2-Chlorophenol	N/A	N/A	3.3E+03	N/A	N/A	N/A	3.3E+02
Chlorpyrifos	1.4E-01	1.3E+00	N/A	N/A	1.4E-01	3.2E-01	N/A
Chromium (+3)	1.4E+03	2.0E+03	N/A	5.7E+02	1.4E+03	4.9E+02	N/A
Chromium (+6)	2.7E+01	3.4E+02	N/A	1.1E+01	2.7E+01	8.6E+01	N/A
Total Chromium	N/A	N/A	4.0E+03	4.0E+03	N/A	N/A	4.1E+02
Chrysene	N/A	N/A	3.7E+00	N/A	N/A	N/A	3.2E-02
Copper	3.5E+01	2.2E+02	5.3E+04	1.4E+01	3.5E+01	5.7E+01	5.3E+03
Cyanide, Free	3.6E+01	1.6E+02	5.7E+03	N/A	3.6E+01	4.1E+01	5.7E+02
DDD	N/A	N/A	2.6E-01	N/A	N/A	N/A	2.6E-02
DDE	N/A	N/A	1.9E-01	N/A	N/A	N/A	1.9E-02
DDT	1.8E+00	3.1E-02	1.9E-01	N/A	1.8E+00	7.8E-03	1.9E-02
Demeton	N/A	3.1E+00	N/A	N/A	N/A	7.8E-01	N/A
Diazinon	2.8E-01	5.3E+00	N/A	N/A	2.8E-01	1.3E+00	N/A
Dibenz(a,h)anthracene	N/A	N/A	3.2E+00	N/A	N/A	N/A	3.2E-01
1,2-Dichlorobenzene	N/A	N/A	1.7E+04	N/A	N/A	N/A	1.7E+03
1,3-Dichlorobenzene	N/A	N/A	1.3E+04	N/A	N/A	N/A	1.3E+03
1,4-Dichlorobenzene	N/A	N/A	2.6E+03	N/A	N/A	N/A	2.6E+02
3,3-Dichlorobenzidine	N/A	N/A	1.8E+01	N/A	N/A	N/A	1.8E+00
Dichlorobromomethane	N/A	N/A	4.7E+02	N/A	N/A	N/A	4.7E+01
1,2-Dichloroethane	N/A	N/A	3.2E+02	N/A	N/A	N/A	3.2E+01
1,1-Dichloroethylene	N/A	N/A	1.3E+04	N/A	N/A	N/A	1.3E+03
1,2-trans-dichloroethylene	N/A	N/A	5.7E+03	N/A	N/A	N/A	5.7E+02
2,4-Dichlorophenol	N/A	N/A	3.1E+03	N/A	N/A	N/A	3.1E+02
2,4-Dichlorophenoxy Acetic Acid	N/A	N/A	4.1E+03	N/A	N/A	N/A	4.1E+02
1,2-Dichloropropane	N/A	N/A	4.2E+02	N/A	N/A	N/A	4.2E+01
1,3-Dichloropropene	N/A	N/A	2.9E+02	N/A	N/A	N/A	2.9E+01
Dieldrin	4.0E-01	1.8E+00	4.4E-02	N/A	4.0E-01	4.4E-01	4.4E-03
Diethyl Phthalate	N/A	N/A	6.9E+05	N/A	N/A	N/A	6.9E+04
2,4 Dimethylphenol	N/A	N/A	1.5E+04	N/A	N/A	N/A	1.5E+03
Dimethyl Phthalate	N/A	N/A	1.1E+07	N/A	N/A	N/A	1.1E+06
Di-n-Butyl Phthalate	N/A	N/A	8.1E+04	N/A	N/A	N/A	8.1E+03
2,4 Dinitrophenol	N/A	N/A	2.8E+03	N/A	N/A	N/A	2.8E+02
2-Methyl-4,6-Dinitrophenol	N/A	N/A	5.3E+02	N/A	N/A	N/A	5.3E+01
2,4-Dinitrotoluene	N/A	N/A	9.3E+01	N/A	N/A	N/A	9.3E+00
Dioxin +	N/A	N/A	2.0E-06	N/A	N/A	N/A	2.0E-07
1,2-Diphenylhydrazine	N/A	N/A	3.0E+01	N/A	N/A	N/A	3.0E+00
Alpha-Endosulfan	3.6E-01	1.8E+00	2.5E+03	N/A	3.6E-01	4.4E-01	2.5E+02
Beta-Endosulfan	3.6E-01	1.8E+00	2.5E+03	N/A	3.6E-01	4.4E-01	2.5E+02
Alpha+Beta-Endosulfan	3.6E-01	1.8E+00	N/A	N/A	3.6E-01	4.4E-01	N/A
Endosulfan Sulfate	N/A	N/A	2.5E+03	N/A	N/A	N/A	2.5E+02
Endrin	1.4E-01	1.1E+00	2.4E+00	N/A	1.4E-01	2.8E-01	2.4E-01
Endrin Aldehyde	N/A	N/A	1.2E+01	N/A	N/A	N/A	1.2E+00
Ethylbenzene	N/A	N/A	2.1E+04	N/A	N/A	N/A	2.1E+03
Fluoranthene	N/A	N/A	5.3E+03	N/A	N/A	N/A	5.3E+02
Fluorene	N/A	N/A	4.5E+04	N/A	N/A	N/A	4.5E+03
Foaming Agents (MBAS)	N/A	N/A	2.0E+04	N/A	N/A	N/A	2.0E+03
Guthion	N/A	3.1E-01	N/A	N/A	N/A	7.8E-02	N/A
Heptachlor	8.6E-01	1.2E-01	6.7E-02	N/A	8.6E-01	3.0E-02	6.7E-03
Heptachlor Epoxide	8.6E-01	1.2E-01	3.3E-02	N/A	8.6E-01	3.0E-02	3.3E-03
Hexachlorobenzene	N/A	N/A	2.4E-01	N/A	N/A	N/A	2.4E-02
Hexachlorobutadiene	N/A	N/A	3.7E+02	N/A	N/A	N/A	3.7E+01
Hexachlorocyclohexane Alpha-BH	N/A	N/A	2.2E+00	N/A	N/A	N/A	2.2E-01
Hexachlorocyclohexane Beta-BHC	N/A	N/A	7.7E+00	N/A	N/A	N/A	7.7E-01
Hexachlorocyclohexane Gamma-BHC (Lindane)	1.6E+00	N/A	8.3E+01	N/A	1.6E+00	N/A	8.3E+00
Hexachlorocyclopentadiene	N/A	N/A	1.6E+03	N/A	N/A	N/A	1.6E+02
Hexachloroethane	N/A	N/A	1.2E+03	N/A	N/A	N/A	1.2E+02
Hydrogen Sulfide	N/A	6.3E+01	N/A	N/A	N/A	1.6E+01	N/A
Indeno(1,2,3-cd)pyrene	N/A	N/A	3.2E+00	N/A	N/A	N/A	3.2E-01
Iron	N/A	N/A	1.2E+04	1.2E+04	N/A	N/A	1.2E+03
Isophorone	N/A	N/A	3.0E+04	N/A	N/A	N/A	3.0E+03
Kepone	N/A	Zero	N/A	N/A	N/A	Zero	N/A
Lead	3.8E+02	3.4E+02	6.1E+02	1.5E+02	3.8E+02	8.1E+01	6.1E+01
Malathion	N/A	3.1E+00	N/A	N/A	N/A	7.8E-01	N/A
Manganese	N/A	N/A	1.5E+03	1.5E+03	N/A	N/A	1.5E+02
Mercury	2.3E+00	2.4E+01	N/A	1.0E+00	2.3E+00	6.0E+00	N/A
Methyl Bromide	N/A	N/A	1.9E+03	N/A	N/A	N/A	1.9E+02
Methylene Chloride	N/A	N/A	3.9E+03	N/A	N/A	N/A	3.9E+02
Methoxychlor	N/A	9.4E-01	4.1E+03	N/A	N/A	2.4E-01	4.1E+02
Mirex	N/A	Zero	N/A	N/A	N/A	Zero	N/A
Nickel	4.6E+02	5.3E+02	2.5E+04	1.9E+02	4.6E+02	1.3E+02	2.5E+03
Nitrate (as N)	N/A	N/A	3.7E+02 mg/L	N/A	N/A	N/A	4.6E+01 mg/L
Nitrobenzene	N/A	N/A	6.9E+02	N/A	N/A	N/A	6.9E+01
N-Nitrosodimethylamine	N/A	N/A	5.8E-01	N/A	N/A	N/A	5.8E-02
N-Nitrosodiphenylamine	N/A	N/A	2.8E+03	N/A	N/A	N/A	2.8E+02
N-Nitrosodi-n-propylamine	N/A	N/A	4.2E+00	N/A	N/A	N/A	4.2E-01
Nonylphenol	4.6E+01	2.1E+02	N/A	N/A	4.6E+01	5.2E+01	N/A
Parathion	1.1E-01	4.1E-01	N/A	N/A	1.1E-01	1.0E-01	N/A
PCB Total	N/A	4.4E-01	5.4E-02	N/A	N/A	1.1E-01	5.4E-03
Pentachlorophenol	1.5E+01	2.8E+02	2.3E+02	N/A	1.5E+01	7.0E+01	2.3E+01
Phenol	N/A	N/A	4.1E+05	N/A	N/A	N/A	4.1E+04
Pyrene	N/A	N/A	3.4E+04	N/A	N/A	N/A	3.4E+03
RadNuc - Beta Part & Photon Act	N/A	N/A	1.6E+02 mrem	N/A	N/A	N/A	1.6E+01 mrem
RadNuc - Gross Alpha Part Act	N/A	N/A	6.1E+02 pCi/L	N/A	N/A	N/A	6.1E+01 pCi/L
RadNuc - Radium 226 + 228	N/A	N/A	2.0E+02 pCi/L	N/A	N/A	N/A	2.0E+01 pCi/L
RadNuc - Uranium	N/A	N/A	1.2E+03	N/A	N/A	N/A	1.2E+02
Selenium, Total Recoverable	3.3E+01	1.6E+02	6.9E+03	1.3E+01	3.3E+01	3.9E+01	6.9E+02
Silver	1.4E+01	N/A	N/A	5.5E+00	1.4E+01	N/A	N/A
Sulfate	N/A	N/A	9.8E+03 mg/L	N/A	N/A	N/A	1.0E+03 mg/L
1,1,2,2-Tetrachloroethane	N/A	N/A	1.4E+02	N/A	N/A	N/A	1.4E+01
Tetrachloroethylene	0.0E+00	N/A	5.8E+02	N/A	N/A	N/A	5.8E+01
Thallium	N/A	N/A	9.7E+00	N/A	N/A	N/A	9.7E-01
Toluene	N/A	N/A	2.1E+04	N/A	N/A	N/A	2.1E+03
Total Dissolved Solids	N/A	N/A	2.0E+07	N/A	N/A	N/A	2.4E+06
Toxaphene	1.2E+00	6.3E-03	2.4E-01	N/A	1.2E+00	1.6E-03	2.4E-02
Tributyltin	7.6E-01	2.3E+00	N/A	N/A	7.6E-01	5.6E-01	N/A
1,2,4-Trichlorobenzene	N/A	N/A	1.4E+03	N/A	N/A	N/A	1.4E+02
1,1,2-Trichloroethane	N/A	N/A	5.0E+02	N/A	N/A	N/A	5.0E+01
Trichloroethylene	N/A	N/A	2.1E+03	N/A	N/A	N/A	2.1E+02
2,4,6-Trichlorophenol	N/A	N/A	1.2E+03	N/A	N/A	N/A	1.2E+02
2-(2,4,5-Trichlorophenoxy propionic acid (Silvex)	N/A	N/A	2.0E+03	N/A	N/A	N/A	2.0E+02
Vinyl Chloride	N/A	N/A	2.1E+01	N/A	N/A	N/A	2.1E+00
Zinc	3.0E+02	3.1E+03	3.0E+05	1.2E+02	3.0E+02	7.7E-02	3.0E+04

2/25/2014 1:46:36 PM

Facility = PFRWTA - 18 MGD
Chemical = ammonia (annual) in mg/L
Chronic averaging period = 30
WLAa = 38
WLAc = 10
Q.L. = 0.20
# samples/mo. = 30
# samples/wk. = 8

Summary of Statistics:

observations = 1
Expected Value = 9
Variance = 29.16
C.V. = 0.6
97th percentile daily values = 21.9007
97th percentile 4 day average = 14.9741
97th percentile 30 day average= 10.8544
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

A limit is needed based on Chronic Toxicity
Maximum Daily Limit = 20.1767009341631
Average Weekly limit = 12.0355047239564
Average Monthly LImit = 10

The data are:

9

2/25/2014 1:39:21 PM

Facility = PFRWTA - 18 MGD
Chemical = ammonia (wet season) in mg/L
Chronic averaging period = 30
WLAa = 39
WLAc = 21
Q.L. = 0.20
# samples/mo. = 30
# samples/wk. = 8

Summary of Statistics:

observations = 1
Expected Value = 9
Variance = 29.16
C.V. = 0.6
97th percentile daily values = 21.9007
97th percentile 4 day average = 14.9741
97th percentile 30 day average= 10.8544
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

No Limit is required for this material

The data are:

9

2/25/2014 1:56:47 PM

Facility = PFRWTA - 18 MGD
Chemical = cadmium in ug/L
Chronic averaging period = 4
WLAa = 20
WLAc = 7.7
Q.L. = 0.2
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 3
Expected Value = .185549
Variance = .012394
C.V. = 0.6
97th percentile daily values = .451520
97th percentile 4 day average = .308715
97th percentile 30 day average= .223782
< Q.L. = 2
Model used = BPJ Assumptions, Type 1 data

No Limit is required for this material

The data are:

0
0
0.2

2/25/2014 2:00:19 PM

Facility = PFRWTA - 18 MGD
Chemical = chromium in ug/L
Chronic averaging period = 4
WLAa = 100
WLAc = 86
Q.L. = 1.0
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 3
Expected Value = 14.1666
Variance = 72.25
C.V. = 0.6
97th percentile daily values = 34.4734
97th percentile 4 day average = 23.5703
97th percentile 30 day average= 17.0857
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

No Limit is required for this material

The data are:

7.8
26.7
8

2/25/2014 2:03:24 PM

Facility = PFRWTA - 18 MGD
Chemical = copper in ug/L
Chronic averaging period = 4
WLAa = 71
WLAc = 57
Q.L. = 2.0
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 3
Expected Value = 5.2
Variance = 9.7344
C.V. = 0.6
97th percentile daily values = 12.6537
97th percentile 4 day average = 8.65170
97th percentile 30 day average= 6.27147
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

No Limit is required for this material

The data are:

5
5.3
5.3

2/25/2014 2:06:00 PM

Facility = PFRWTA - 18 MGD
Chemical = nickel in ug/L
Chronic averaging period = 4
WLAa = 970
WLAc = 130
Q.L. = 2.0
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 3
Expected Value = 5.56666
Variance = 11.1556
C.V. = 0.6
97th percentile daily values = 13.5460
97th percentile 4 day average = 9.26176
97th percentile 30 day average= 6.71369
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

No Limit is required for this material

The data are:

4.5
6.7
5.5

2/25/2014 2:08:48 PM

Facility = PFRWTA - 18 MGD
Chemical = zinc in ug/L
Chronic averaging period = 4
WLAa = 630
WLAc = 770
Q.L. = 3.0
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 3
Expected Value = 35
Variance = 441
C.V. = 0.6
97th percentile daily values = 85.1696
97th percentile 4 day average = 58.2326
97th percentile 30 day average= 42.2118
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

No Limit is required for this material

The data are:

29.5
34.9
40.6

FRESHWATER
WATER QUALITY CRITERIA / WASTELOAD ALLOCATION ANALYSIS

Facility Name: Pepper's Ferry Regional Wastewater Treatment Authority Permit No.: VA0062685

Receiving Stream: New River

Version: OWP Guidance Memo 00-2011 (8/24/00)

Stream Information

Mean Hardness (as CaCO3) =	78.7	mg/L
90% Temperature (Annual) =	22.9	deg C
90% Temperature (Wet season) =	16.6	deg C
90% Maximum pH =	8.3	SU
10% Maximum pH =	7.3	SU
Tier Designation (1 or 2) =	2	
Public Water Supply (PWS) Y/N? =	Y	
Trout Present Y/N? =	N	
Early Life Stages Present Y/N? =	Y	

Stream Flows

1Q10 (Annual) =	436	MGD
7Q10 (Annual) =	546	MGD
30Q10 (Annual) =	633	MGD
1Q10 (Wet season) =	515	MGD
30Q10 (Wet season)	1053	MGD
30Q5 =	712	MGD
Harmonic Mean =	1506	MGD

Mixing Information

Annual - 1Q10 Mix =	2.67	%
- 7Q10 Mix =	100	%
- 30Q10 Mix =	100	%
Wet Season - 1Q10 Mix =	3.1	%
- 30Q10 Mix =	100	%

Effluent Information

Mean Hardness (as CaCO3) =	223	mg/L
90% Temp (Annual) =	23	deg C
90% Temp (Wet season) =	18	deg C
90% Maximum pH =	7.3	SU
10% Maximum pH =	6.9	SU
Discharge Flow =	18	MGD

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				**Most Limiting Allocations**			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	**Acute**	**Chronic**	**HH (PWS)**	**HH**
Acenapthene	0	--	--	6.7E+02	9.9E+02	--	--	2.7E+04	4.0E+04	--	--	6.7E+01	9.9E+01	--	--	2.7E+03	4.0E+03	**--**	**--**	**2.7E+03**	**4.0E+03**
Acrolein	0	--	--	6.1E+00	9.3E+00	--	--	2.5E+02	3.8E+02	--	--	6.1E-01	9.3E-01	--	--	2.5E+01	3.8E+01	**--**	**--**	**2.5E+01**	**3.8E+01**
Acrylonitrile[c]	0	--	--	5.1E-01	2.5E+00	--	--	4.3E+01	2.1E+02	--	--	5.1E-02	2.5E-01	--	--	4.3E+00	2.1E+01	**--**	**--**	**4.3E+00**	**2.1E+01**
Aldrin[c]	0	3.0E+00	--	4.9E-04	5.0E-04	4.9E+00	--	4.1E-02	4.2E-02	7.5E-01	--	4.9E-05	5.0E-05	1.9E+01	--	4.1E-03	4.2E-03	**4.9E+00**	**--**	**4.1E-03**	**4.2E-03**
Ammonia-N (mg/l) (Yearly)	0.01	2.02E+01	1.04E+00	--	--	3.33E+01	3.72E+01	--	--	1.53E+00	2.67E-01	--	--	3.84E+01	9.31E+00	--	--	**3.33E+01**	**9.31E+00**	**--**	**--**
Ammonia-N (mg/l) (High Flow)	0.01	1.88E+01	1.47E+00	--	--	3.54E+01	8.69E+01	--	--	1.48E+00	3.75E-01	--	--	4.36E+01	2.17E+01	--	--	**3.54E+01**	**2.17E+01**	**--**	**--**
Anthracene	0	--	--	8.3E+03	4.0E+04	--	--	3.4E+05	1.6E+06	--	--	8.3E+02	4.0E+03	--	--	3.4E+04	1.6E+05	**--**	**--**	**3.4E+04**	**1.6E+05**
Antimony	0	--	--	5.6E+00	6.4E+02	--	--	2.3E+02	2.6E+04	--	--	5.6E-01	6.4E+01	--	--	2.3E+01	2.6E+03	**--**	**--**	**2.3E+01**	**2.6E+03**
Arsenic	0.35	3.4E+02	1.5E+02	1.0E+01	--	5.6E+02	4.7E+03	3.9E+02	--	8.5E+01	3.8E+01	1.3E+00	--	2.1E+03	1.2E+03	3.9E+01	--	**5.6E+02**	**1.2E+03**	**3.9E+01**	**--**
Barium	0	--	--	2.0E+03	--	--	--	8.1E+04	--	--	--	2.0E+02	--	--	--	8.1E+03	--	**--**	**--**	**8.1E+03**	**--**
Benzene[c]	0	--	--	2.2E+01	5.1E+02	--	--	1.9E+03	4.3E+04	--	--	2.2E+00	5.1E+01	--	--	1.9E+02	4.3E+03	**--**	**--**	**1.9E+02**	**4.3E+03**
Benzidine[c]	0	--	--	8.6E-04	2.0E-03	--	--	7.3E-02	1.7E-01	--	--	8.6E-05	2.0E-04	--	--	7.3E-03	1.7E-02	**--**	**--**	**7.3E-03**	**1.7E-02**
Benzo (a) anthracene[c]	0	--	--	3.8E-02	1.8E-01	--	--	3.2E+00	1.5E+01	--	--	3.8E-03	1.8E-02	--	--	3.2E-01	1.5E+00	**--**	**--**	**3.2E-01**	**1.5E+00**
Benzo (b) fluoranthene[c]	0	--	--	3.8E-02	1.8E-01	--	--	3.2E+00	1.5E+01	--	--	3.8E-03	1.8E-02	--	--	3.2E-01	1.5E+00	**--**	**--**	**3.2E-01**	**1.5E+00**
Benzo (k) fluoranthene[c]	0	--	--	3.8E-02	1.8E-01	--	--	3.2E+00	1.5E+01	--	--	3.8E-03	1.8E-02	--	--	3.2E-01	1.5E+00	**--**	**--**	**3.2E-01**	**1.5E+00**
Benzo (a) pyrene[c]	0	--	--	3.8E-02	1.8E-01	--	--	3.2E+00	1.5E+01	--	--	3.8E-03	1.8E-02	--	--	3.2E-01	1.5E+00	**--**	**--**	**3.2E-01**	**1.5E+00**
Bis2-Chloroethyl Ether[c]	0	--	--	3.0E-01	5.3E+00	--	--	2.5E+01	4.5E+02	--	--	3.0E-02	5.3E-01	--	--	2.5E+00	4.5E+01	**--**	**--**	**2.5E+00**	**4.5E+01**
Bis2-Chloroisopropyl Ether	0	--	--	1.4E+03	6.5E+04	--	--	5.7E+04	2.6E+06	--	--	1.4E+02	6.5E+03	--	--	5.7E+03	2.6E+05	**--**	**--**	**5.7E+03**	**2.6E+05**
Bis 2-Ethylhexyl Phthalate[c]	0	--	--	1.2E+01	2.2E+01	--	--	1.0E+03	1.9E+03	--	--	1.2E+00	2.2E+00	--	--	1.0E+02	1.9E+02	**--**	**--**	**1.0E+02**	**1.9E+02**
Bromoform[c]	0	--	--	4.3E+01	1.4E+03	--	--	3.6E+03	1.2E+05	--	--	4.3E+00	1.4E+02	--	--	3.6E+02	1.2E+04	**--**	**--**	**3.6E+02**	**1.2E+04**
Butylbenzylphthalate	0	--	--	1.5E+03	1.9E+03	--	--	6.1E+04	7.7E+04	--	--	1.5E+02	1.9E+02	--	--	6.1E+03	7.7E+03	**--**	**--**	**6.1E+03**	**7.7E+03**
Cadmium	0	7.0E+00	9.8E-01	5.0E+00	--	1.1E+01	3.1E+01	2.0E+02	--	8.1E-01	2.5E-01	5.0E-01	--	2.0E+01	7.7E+00	2.0E+01	--	**1.1E+01**	**7.7E+00**	**2.0E+01**	**--**
Carbon Tetrachloride[c]	0	--	--	2.3E+00	1.6E+01	--	--	1.9E+02	1.4E+03	--	--	2.3E-01	1.6E+00	--	--	1.9E+01	1.4E+02	**--**	**--**	**1.9E+01**	**1.4E+02**
Chlordane[c]	0	2.4E+00	4.3E-03	8.0E-03	8.1E-03	4.0E+00	1.3E-01	6.8E-01	6.9E-01	6.0E-01	1.1E-03	8.0E-04	8.1E-04	1.5E+01	3.4E-02	6.8E-02	6.9E-02	**4.0E+00**	**3.4E-02**	**6.8E-02**	**6.9E-02**
Chloride	9120	8.6E+05	2.3E+05	2.5E+05	--	1.4E+06	6.9E+06	9.8E+06	--	2.2E+05	6.4E+04	3.3E+04	--	5.4E+06	1.7E+06	9.9E+05	--	**1.4E+06**	**1.7E+06**	**9.9E+05**	**--**
TRC	0	1.9E+01	1.1E+01	--	--	3.1E+01	3.4E+02	--	--	4.8E+00	2.8E+00	--	--	1.2E+02	8.6E+01	--	--	**3.1E+01**	**8.6E+01**	**--**	**--**
Chlorobenzene	0	--	--	1.3E+02	1.6E+03	--	--	5.3E+03	6.5E+04	--	--	1.3E+01	1.6E+02	--	--	5.3E+02	6.5E+03	**--**	**--**	**5.3E+02**	**6.5E+03**
Chlorodibromomethane[c]	0	--	--	4.0E+00	1.3E+02	--	--	3.4E+02	1.1E+04	--	--	4.0E-01	1.3E+01	--	--	3.4E+01	1.1E+03	**--**	**--**	**3.4E+01**	**1.1E+03**

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				**Most Limiting Allocations**			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	**Acute**	**Chronic**	**HH (PWS)**	**HH**
Chloroform	0	--	--	3.4E+02	1.1E+04	--	--	1.4E+04	4.5E+05	--	--	3.4E+01	1.1E+03	--	--	1.4E+03	4.5E+04	**--**	**--**	**1.4E+03**	**4.5E+04**
2-Chloronaphthalene	0	--	--	1.0E+03	1.6E+03	--	--	4.1E+04	6.5E+04	--	--	1.0E+02	1.6E+02	--	--	4.1E+03	6.5E+03	**--**	**--**	**4.1E+03**	**6.5E+03**
2-Chlorophenol	0	--	--	8.1E+01	1.5E+02	--	--	3.3E+03	6.1E+03	--	--	8.1E+00	1.5E+01	--	--	3.3E+02	6.1E+02	**--**	**--**	**3.3E+02**	**6.1E+02**
Chlorpyrifos	0	8.3E-02	4.1E-02	--	--	1.4E-01	1.3E+00	--	--	2.1E-02	1.0E-02	--	--	5.2E-01	3.2E-01	--	--	**1.4E-01**	**3.2E-01**	**--**	**--**
Chromium III	0	8.6E+02	6.4E+01	--	--	1.4E+03	2.0E+03	--	--	1.2E+02	1.6E+01	--	--	3.1E+03	5.0E+02	--	--	**1.4E+03**	**5.0E+02**	**--**	**--**
Chromium VI	0	1.6E+01	1.1E+01	--	--	2.6E+01	3.4E+02	--	--	4.0E+00	2.8E+00	--	--	1.0E+02	8.6E+01	--	--	**2.6E+01**	**8.6E+01**	**--**	**--**
Chromium, Total	0.18	--	--	1.0E+02	--	--	--	4.0E+03	--	--	--	1.0E+01	--	--	--	4.1E+02	--	**--**	**--**	**4.1E+02**	**--**
Chrysene[c]	0	--	--	3.8E-03	1.8E-02	--	--	3.2E-01	1.5E+00	--	--	3.8E-04	1.8E-03	--	--	3.2E-02	1.5E-01	**--**	**--**	**3.2E-02**	**1.5E-01**
Copper	0.65	2.2E+01	7.7E+00	1.3E+03	--	3.5E+01	2.2E+02	5.3E+04	--	3.4E+00	2.4E+00	1.3E+02	--	6.9E+01	5.6E+01	5.3E+03	--	**3.5E+01**	**5.6E+01**	**5.3E+03**	**--**
Cyanide, Free	0	2.2E+01	5.2E+00	1.4E+02	1.6E+04	3.6E+01	1.6E+02	5.7E+03	6.5E+05	5.5E+00	1.3E+00	1.4E+01	1.6E+03	1.4E+02	4.1E+01	5.7E+02	6.5E+04	**3.6E+01**	**4.1E+01**	**5.7E+02**	**6.5E+04**
DDD[c]	0	--	--	3.1E-03	3.1E-03	--	--	2.6E-01	2.6E-01	--	--	3.1E-04	3.1E-04	--	--	2.6E-02	2.6E-02	**--**	**--**	**2.6E-02**	**2.6E-02**
DDE[c]	0	--	--	2.2E-03	2.2E-03	--	--	1.9E-01	1.9E-01	--	--	2.2E-04	2.2E-04	--	--	1.9E-02	1.9E-02	**--**	**--**	**1.9E-02**	**1.9E-02**
DDT[c]	0	1.1E+00	1.0E-03	2.2E-03	2.2E-03	1.8E+00	3.1E-02	1.9E-01	1.9E-01	2.8E-01	2.5E-04	2.2E-04	2.2E-04	6.9E+00	7.8E-03	1.9E-02	1.9E-02	**1.8E+00**	**7.8E-03**	**1.9E-02**	**1.9E-02**
Demeton	0	--	1.0E-01	--	--	--	3.1E+00	--	--	--	2.5E-02	--	--	--	7.8E-01	--	--	**--**	**7.8E-01**	**--**	**--**
Diazinon	0	1.7E-01	1.7E-01	--	--	2.8E-01	5.3E+00	--	--	4.3E-02	4.3E-02	--	--	1.1E+00	1.3E+00	--	--	**2.8E-01**	**1.3E+00**	**--**	**--**
Dibenz(a,h)anthracene[c]	0	--	--	3.8E-02	1.8E-01	--	--	3.2E+00	1.5E+01	--	--	3.8E-03	1.8E-02	--	--	3.2E-01	1.5E+00	**--**	**--**	**3.2E-01**	**1.5E+00**
1,2-Dichlorobenzene	0	--	--	4.2E+02	1.3E+03	--	--	1.7E+04	5.3E+04	--	--	4.2E+01	1.3E+02	--	--	1.7E+03	5.3E+03	**--**	**--**	**1.7E+03**	**5.3E+03**
1,3-Dichlorobenzene	0	--	--	3.2E+02	9.6E+02	--	--	1.3E+04	3.9E+04	--	--	3.2E+01	9.6E+01	--	--	1.3E+03	3.9E+03	**--**	**--**	**1.3E+03**	**3.9E+03**
1,4-Dichlorobenzene	0	--	--	6.3E+01	1.9E+02	--	--	2.6E+03	7.7E+03	--	--	6.3E+00	1.9E+01	--	--	2.6E+02	7.7E+02	**--**	**--**	**2.6E+02**	**7.7E+02**
3,3-Dichlorobenzidine[c]	0	--	--	2.1E-01	2.8E-01	--	--	1.8E+01	2.4E+01	--	--	2.1E-02	2.8E-02	--	--	1.8E+00	2.4E+00	**--**	**--**	**1.8E+00**	**2.4E+00**
Dichlorobromomethane[c]	0	--	--	5.5E+00	1.7E+02	--	--	4.7E+02	1.4E+04	--	--	5.5E-01	1.7E+01	--	--	4.7E+01	1.4E+03	**--**	**--**	**4.7E+01**	**1.4E+03**
1,2-Dichloroethane[c]	0	--	--	3.8E+00	3.7E+02	--	--	3.2E+02	3.1E+04	--	--	3.8E-01	3.7E+01	--	--	3.2E+01	3.1E+03	**--**	**--**	**3.2E+01**	**3.1E+03**
1,1-Dichloroethylene	0	--	--	3.3E+02	7.1E+03	--	--	1.3E+04	2.9E+05	--	--	3.3E+01	7.1E+02	--	--	1.3E+03	2.9E+04	**--**	**--**	**1.3E+03**	**2.9E+04**
1,2-trans-dichloroethylene	0	--	--	1.4E+02	1.0E+04	--	--	5.7E+03	4.1E+05	--	--	1.4E+01	1.0E+03	--	--	5.7E+02	4.1E+04	**--**	**--**	**5.7E+02**	**4.1E+04**
2,4-Dichlorophenol	0	--	--	7.7E+01	2.9E+02	--	--	3.1E+03	1.2E+04	--	--	7.7E+00	2.9E+01	--	--	3.1E+02	1.2E+03	**--**	**--**	**3.1E+02**	**1.2E+03**
2,4-Dichlorophenoxy acetic acid (2,4-D)	0	--	--	1.0E+02	--	--	--	4.1E+03	--	--	--	1.0E+01	--	--	--	4.1E+02	--	**--**	**--**	**4.1E+02**	**--**
1,2-Dichloropropane[c]	0	--	--	5.0E+00	1.5E+02	--	--	4.2E+02	1.3E+04	--	--	5.0E-01	1.5E+01	--	--	4.2E+01	1.3E+03	**--**	**--**	**4.2E+01**	**1.3E+03**
1,3-Dichloropropene[c]	0	--	--	3.4E+00	2.1E+02	--	--	2.9E+02	1.8E+04	--	--	3.4E-01	2.1E+01	--	--	2.9E+01	1.8E+03	**--**	**--**	**2.9E+01**	**1.8E+03**
Dieldrin[c]	0	2.4E-01	5.6E-02	5.2E-04	5.4E-04	4.0E-01	1.8E+00	4.4E-02	4.6E-02	6.0E-02	1.4E-02	5.2E-05	5.4E-05	1.5E+00	4.4E-01	4.4E-03	4.6E-03	**4.0E-01**	**4.4E-01**	**4.4E-03**	**4.6E-03**
Diethyl Phthalate	0	--	--	1.7E+04	4.4E+04	--	--	6.9E+05	1.8E+06	--	--	1.7E+03	4.4E+03	--	--	6.9E+04	1.8E+05	**--**	**--**	**6.9E+04**	**1.8E+05**
2,4-Dimethylphenol	0	--	--	3.8E+02	8.5E+02	--	--	1.5E+04	3.4E+04	--	--	3.8E+01	8.5E+01	--	--	1.5E+03	3.4E+03	**--**	**--**	**1.5E+03**	**3.4E+03**
Dimethyl Phthalate	0	--	--	2.7E+05	1.1E+06	--	--	1.1E+07	4.5E+07	--	--	2.7E+04	1.1E+05	--	--	1.1E+06	4.5E+06	**--**	**--**	**1.1E+06**	**4.5E+06**
Di-n-Butyl Phthalate	0	--	--	2.0E+03	4.5E+03	--	--	8.1E+04	1.8E+05	--	--	2.0E+02	4.5E+02	--	--	8.1E+03	1.8E+04	**--**	**--**	**8.1E+03**	**1.8E+04**
2,4 Dinitrophenol	0	--	--	6.9E+01	5.3E+03	--	--	2.8E+03	2.1E+05	--	--	6.9E+00	5.3E+02	--	--	2.8E+02	2.1E+04	**--**	**--**	**2.8E+02**	**2.1E+04**
2-Methyl-4,6-Dinitrophenol	0	--	--	1.3E+01	2.8E+02	--	--	5.3E+02	1.1E+04	--	--	1.3E+00	2.8E+01	--	--	5.3E+01	1.1E+03	**--**	**--**	**5.3E+01**	**1.1E+03**
2,4-Dinitrotoluene[c]	0	--	--	1.1E+00	3.4E+01	--	--	9.3E+01	2.9E+03	--	--	1.1E-01	3.4E+00	--	--	9.3E+00	2.9E+02	**--**	**--**	**9.3E+00**	**2.9E+02**
Dioxin 2,3,7,8-tetrachlorodibenzo-p-dioxin	0	--	--	5.0E-08	5.1E-08	--	--	2.0E-06	2.1E-06	--	--	5.0E-09	5.1E-09	--	--	2.0E-07	2.1E-07	**--**	**--**	**2.0E-07**	**2.1E-07**
1,2-Diphenylhydrazine[c]	0	--	--	3.6E-01	2.0E+00	--	--	3.0E+01	1.7E+02	--	--	3.6E-02	2.0E-01	--	--	3.0E+00	1.7E+01	**--**	**--**	**3.0E+00**	**1.7E+01**
Alpha-Endosulfan	0	2.2E-01	5.6E-02	6.2E+01	8.9E+01	3.6E-01	1.8E+00	2.5E+03	3.6E+03	5.5E-02	1.4E-02	6.2E+00	8.9E+00	1.4E+00	4.4E-01	2.5E+02	3.6E+02	**3.6E-01**	**4.4E-01**	**2.5E+02**	**3.6E+02**
Beta-Endosulfan	0	2.2E-01	5.6E-02	6.2E+01	8.9E+01	3.6E-01	1.8E+00	2.5E+03	3.6E+03	5.5E-02	1.4E-02	6.2E+00	8.9E+00	1.4E+00	4.4E-01	2.5E+02	3.6E+02	**3.6E-01**	**4.4E-01**	**2.5E+02**	**3.6E+02**
Alpha + Beta Endosulfan	0	2.2E-01	5.6E-02	--	--	3.6E-01	1.8E+00	--	--	5.5E-02	1.4E-02	--	--	1.4E+00	4.4E-01	--	--	**3.6E-01**	**4.4E-01**	**--**	**--**
Endosulfan Sulfate	0	--	--	6.2E+01	8.9E+01	--	--	2.5E+03	3.6E+03	--	--	6.2E+00	8.9E+00	--	--	2.5E+02	3.6E+02	**--**	**--**	**2.5E+02**	**3.6E+02**
Endrin	0	8.6E-02	3.6E-02	5.9E-02	6.0E-02	1.4E-01	1.1E+00	2.4E+00	2.4E+00	2.2E-02	9.0E-03	5.9E-03	6.0E-03	5.4E-01	2.8E-01	2.4E-01	2.4E-01	**1.4E-01**	**2.8E-01**	**2.4E-01**	**2.4E-01**
Endrin Aldehyde	0	--	--	2.9E-01	3.0E-01	--	--	1.2E+01	1.2E+01	--	--	2.9E-02	3.0E-02	--	--	1.2E+00	1.2E+00	**--**	**--**	**1.2E+00**	**1.2E+00**
Ethylbenzene	0	--	--	5.3E+02	2.1E+03	--	--	2.1E+04	8.5E+04	--	--	5.3E+01	2.1E+02	--	--	2.1E+03	8.5E+03	**--**	**--**	**2.1E+03**	**8.5E+03**
Fluoranthene	0	--	--	1.3E+02	1.4E+02	--	--	5.3E+03	5.7E+03	--	--	1.3E+01	1.4E+01	--	--	5.3E+02	5.7E+02	**--**	**--**	**5.3E+02**	**5.7E+02**
Fluorene	0	--	--	1.1E+03	5.3E+03	--	--	4.5E+04	2.1E+05	--	--	1.1E+02	5.3E+02	--	--	4.5E+03	2.1E+04	**--**	**--**	**4.5E+03**	**2.1E+04**
Foaming Agents	0	--	--	5.0E+02	--	--	--	2.0E+04	--	--	--	5.0E+01	--	--	--	2.0E+03	--	**--**	**--**	**2.0E+03**	**--**

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Guthion	0	--	1.0E-02	--	--	--	3.1E-01	--	--	--	2.5E-03	--	--	--	7.8E-02	--	--	--	7.8E-02	--	--
Heptachlor[C]	0	5.2E-01	3.8E-03	7.9E-04	7.9E-04	8.6E-01	1.2E-01	6.7E-02	6.7E-02	1.3E-01	9.5E-04	7.9E-05	7.9E-05	3.3E+00	3.0E-02	6.7E-03	6.7E-03	8.6E-01	3.0E-02	6.7E-03	6.7E-03
Heptachlor Epoxide[C]	0	5.2E-01	3.8E-03	3.9E-04	3.9E-04	8.6E-01	1.2E-01	3.3E-02	3.3E-02	1.3E-01	9.5E-04	3.9E-05	3.9E-05	3.3E+00	3.0E-02	3.3E-03	3.3E-03	8.6E-01	3.0E-02	3.3E-03	3.3E-03
Hexachlorobenzene[C]	0	--	--	2.8E-03	2.9E-03	--	--	2.4E-01	2.5E-01	--	--	2.8E-04	2.9E-04	--	--	2.4E-02	2.5E-02	--	--	2.4E-02	2.5E-02
Hexachlorobutadiene[C]	0	--	--	4.4E+00	1.8E+02	--	--	3.7E+02	1.5E+04	--	--	4.4E-01	1.8E+01	--	--	3.7E+01	1.5E+03	--	--	3.7E+01	1.5E+03
Hexachlorocyclohexane Alpha-BHC[C]	0	--	--	2.6E-02	4.9E-02	--	--	2.2E+00	4.1E+00	--	--	2.6E-03	4.9E-03	--	--	2.2E-01	4.1E-01	--	--	2.2E-01	4.1E-01
Hexachlorocyclohexane Beta-BHC[C]	0	--	--	9.1E-02	1.7E-01	--	--	7.7E+00	1.4E+01	--	--	9.1E-03	1.7E-02	--	--	7.7E-01	1.4E+00	--	--	7.7E-01	1.4E+00
Hexachlorocyclohexane Gamma-BHC[C] (Lindane)	0	9.5E-01	--	9.8E-01	1.8E+00	1.6E+00	--	8.3E+01	1.5E+02	2.4E-01	--	9.8E-02	1.8E-01	6.0E+00	--	8.3E+00	1.5E+01	1.6E+00	--	8.3E+00	1.5E+01
Hexachlorocyclopentadiene	0	--	--	4.0E+01	1.1E+03	--	--	1.6E+03	4.5E+04	--	--	4.0E+00	1.1E+02	--	--	1.6E+02	4.5E+03	--	--	1.6E+02	4.5E+03
Hexachloroethane[C]	0	--	--	1.4E+01	3.3E+01	--	--	1.2E+03	2.8E+03	--	--	1.4E+00	3.3E+00	--	--	1.2E+02	2.8E+02	--	--	1.2E+02	2.8E+02
Hydrogen Sulfide	0	--	2.0E+00	--	--	--	6.3E+01	--	--	--	5.0E-01	--	--	--	1.6E+01	--	--	--	1.6E+01	--	--
Indeno (1,2,3-cd) pyrene[C]	0	--	--	3.8E-02	1.8E-01	--	--	3.2E+00	1.5E+01	--	--	3.8E-03	1.8E-02	--	--	3.2E-01	1.5E+00	--	--	3.2E-01	1.5E+00
Iron	0	--	--	3.0E+02	--	--	--	1.2E+04	--	--	--	3.0E+01	--	--	--	1.2E+03	--	--	--	1.2E+03	--
Isophorone[C]	0	--	--	3.5E+02	9.6E+03	--	--	3.0E+04	8.1E+05	--	--	3.5E+01	9.6E+02	--	--	3.0E+03	8.1E+04	--	--	3.0E+03	8.1E+04
Kepone	0	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--	--
Lead	0	2.3E+02	1.1E+01	1.5E+01	--	3.7E+02	3.4E+02	6.1E+02	--	2.4E+01	2.7E+00	1.5E+00	--	6.0E+02	8.4E+01	6.1E+01	--	3.7E+02	8.4E+01	6.1E+01	--
Malathion	0	--	1.0E-01	--	--	--	3.1E+00	--	--	--	2.5E-02	--	--	--	7.8E-01	--	--	--	7.8E-01	--	--
Manganese	14.32	--	--	5.0E+01	--	--	--	1.5E+03	--	--	--	1.8E+01	--	--	--	1.6E+02	--	--	--	1.6E+02	--
Mercury	0	1.4E+00	7.7E-01	--	--	2.3E+00	2.4E+01	--	--	3.5E-01	1.9E-01	--	--	8.8E+00	6.0E+00	--	--	2.3E+00	6.0E+00	--	--
Methyl Bromide	0	--	--	4.7E+01	1.5E+03	--	--	1.9E+03	6.1E+04	--	--	4.7E+00	1.5E+02	--	--	1.9E+02	6.1E+03	--	--	1.9E+02	6.1E+03
Methylene Chloride[C]	0	--	--	4.6E+01	5.9E+03	--	--	3.9E+03	5.0E+05	--	--	4.6E+00	5.9E+02	--	--	3.9E+02	5.0E+04	--	--	3.9E+02	5.0E+04
Methoxychlor	0	--	3.0E-02	1.0E+02	--	--	9.4E-01	4.1E+03	--	--	7.5E-03	1.0E+01	--	--	2.4E-01	4.1E+02	--	--	2.4E-01	4.1E+02	--
Mirex	0	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--	--
Nickel	0.39	2.8E+02	1.7E+01	6.1E+02	4.6E+03	4.6E+02	5.3E+02	2.5E+04	1.9E+05	4.0E+01	4.6E+00	6.1E+01	4.6E+02	9.9E+02	1.3E+02	2.5E+03	1.9E+04	4.6E+02	1.3E+02	2.5E+03	1.9E+04
Nitrate (as N)	940	--	--	1.0E+04	--	--	--	3.7E+05	--	--	--	1.8E+03	--	--	--	3.8E+04	--	--	--	3.8E+04	--
Nitrobenzene	0	--	--	1.7E+01	6.9E+02	--	--	6.9E+02	2.8E+04	--	--	1.7E+00	6.9E+01	--	--	6.9E+01	2.8E+03	--	--	6.9E+01	2.8E+03
N-Nitrosodimethylamine[C]	0	--	--	6.9E-03	3.0E+01	--	--	5.8E-01	2.5E+03	--	--	6.9E-04	3.0E+00	--	--	5.8E-02	2.5E+02	--	--	5.8E-02	2.5E+02
N-Nitrosodiphenylamine[C]	0	--	--	3.3E+01	6.0E+01	--	--	2.8E+03	5.1E+03	--	--	3.3E+00	6.0E+00	--	--	2.8E+02	5.1E+02	--	--	2.8E+02	5.1E+02
N-Nitrosodi-n-propylamine[C]	0	--	--	5.0E-02	5.1E+00	--	--	4.2E+00	4.3E+02	--	--	5.0E-03	5.1E-01	--	--	4.2E-01	4.3E+01	--	--	4.2E-01	4.3E+01
Nonylphenol	0	2.8E+01	6.6E+00	--	--	4.6E+01	2.1E+02	--	--	7.0E+00	1.7E+00	--	--	1.8E+02	5.2E+01	--	--	4.6E+01	5.2E+01	--	--
Parathion	0	6.5E-02	1.3E-02	--	--	1.1E-01	4.1E-01	--	--	1.6E-02	3.3E-03	--	--	4.1E-01	1.0E-01	--	--	1.1E-01	1.0E-01	--	--
PCB Total[C]	0.0001712	--	1.4E-02	6.4E-04	6.4E-04	--	4.3E-01	4.0E-02	4.0E-02	--	3.6E-03	2.2E-04	2.2E-04	--	1.1E-01	4.1E-03	4.1E-03	--	1.1E-01	4.1E-03	4.1E-03
Pentachlorophenol[C]	0	8.9E+00	8.9E+00	2.7E+00	3.0E+01	1.5E+01	2.8E+02	2.3E+02	2.5E+03	2.9E+00	2.2E+00	2.7E-01	3.0E+00	7.2E+01	6.9E+01	2.3E+01	2.5E+02	1.5E+01	6.9E+01	2.3E+01	2.5E+02
Phenol	0	--	--	1.0E+04	8.6E+05	--	--	4.1E+05	3.5E+07	--	--	1.0E+03	8.6E+04	--	--	4.1E+04	3.5E+06	--	--	4.1E+04	3.5E+06
Pyrene	0	--	--	8.3E+02	4.0E+03	--	--	3.4E+04	1.6E+05	--	--	8.3E+01	4.0E+02	--	--	3.4E+03	1.6E+04	--	--	3.4E+03	1.6E+04
Radionuclides	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Gross Alpha Activity (pCi/L)	0	--	--	1.5E+01	--	--	--	6.1E+02	--	--	--	1.5E+00	--	--	--	6.1E+01	--	--	--	6.1E+01	--
Beta and Photon Activity (mrem/yr)	0	--	--	4.0E+00	--	--	--	1.6E+02	--	--	--	4.0E-01	--	--	--	1.6E+01	--	--	--	1.6E+01	--
Radium 226 + 228 (pCi/L)	0	--	--	5.0E+00	--	--	--	2.0E+02	--	--	--	5.0E-01	--	--	--	2.0E+01	--	--	--	2.0E+01	--
Uranium (ug/l)	0	--	--	3.0E+01	--	--	--	1.2E+03	--	--	--	3.0E+00	--	--	--	1.2E+02	--	--	--	1.2E+02	--
Selenium, Total Recoverable	0	2.0E+01	5.0E+00	1.7E+02	4.2E+03	3.3E+01	1.6E+02	6.9E+03	1.7E+05	5.0E+00	1.3E+00	1.7E+01	4.2E+02	1.3E+02	3.9E+01	6.9E+02	1.7E+04	3.3E+01	3.9E+01	6.9E+02	1.7E+04
Silver	0	8.3E+00	--	--	--	1.4E+01	--	--	--	6.4E-01	--	--	--	1.6E+01	--	--	--	1.4E+01	--	--	--
Sulfate	8690	--	--	2.5E+05	--	--	--	9.8E+06	--	--	--	3.3E+04	--	--	--	9.9E+05	--	--	--	9.9E+05	--
1,1,2,2-Tetrachloroethane[C]	0	--	--	1.7E+00	4.0E+01	--	--	1.4E+02	3.4E+03	--	--	1.7E-01	4.0E+00	--	--	1.4E+01	3.4E+02	--	--	1.4E+01	3.4E+02
Tetrachloroethylene[C]	0	--	--	6.9E+00	3.3E+01	--	--	5.8E+02	2.8E+03	--	--	6.9E-01	3.3E+00	--	--	5.8E+01	2.8E+02	--	--	5.8E+01	2.8E+02
Thallium	0	--	--	2.4E-01	4.7E-01	--	--	9.7E+00	1.9E+01	--	--	2.4E-02	4.7E-02	--	--	9.7E-01	1.9E+00	--	--	9.7E-01	1.9E+00

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				**Most Limiting Allocations**			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	**Acute**	**Chronic**	**HH (PWS)**	**HH**
Toluene	0	--	--	5.1E+02	6.0E+03	--	--	2.1E+04	2.4E+05	--	--	5.1E+01	6.0E+02	--	--	2.1E+03	2.4E+04	**--**	**--**	**2.1E+03**	**2.4E+04**
Total dissolved solids	0	--	--	5.0E+05	--	--	--	2.0E+07	--	--	--	5.0E+04	--	--	--	2.0E+06	--	**--**	**--**	**2.0E+06**	**--**
Toxaphene[c]	0	7.3E-01	2.0E-04	2.8E-03	2.8E-03	1.2E+00	6.3E-03	2.4E-01	2.4E-01	1.8E-01	5.0E-05	2.8E-04	2.8E-04	4.6E+00	1.6E-03	2.4E-02	2.4E-02	**1.2E+00**	**1.6E-03**	**2.4E-02**	**2.4E-02**
Tributyltin	0	4.6E-01	7.2E-02	--	--	7.6E-01	2.3E+00	--	--	1.2E-01	1.8E-02	--	--	2.9E+00	5.6E-01	--	--	**7.6E-01**	**5.6E-01**	**--**	**--**
1,2,4-Trichlorobenzene	0	--	--	3.5E+01	7.0E+01	--	--	1.4E+03	2.8E+03	--	--	3.5E+00	7.0E+00	--	--	1.4E+02	2.8E+02	**--**	**--**	**1.4E+02**	**2.8E+02**
1,1,2-Trichloroethane[c]	0	--	--	5.9E+00	1.6E+02	--	--	5.0E+02	1.4E+04	--	--	5.9E-01	1.6E+01	--	--	5.0E+01	1.4E+03	**--**	**--**	**5.0E+01**	**1.4E+03**
Trichloroethylene[c]	0	--	--	2.5E+01	3.0E+02	--	--	2.1E+03	2.5E+04	--	--	2.5E+00	3.0E+01	--	--	2.1E+02	2.5E+03	**--**	**--**	**2.1E+02**	**2.5E+03**
2,4,6-Trichlorophenol[c]	0	--	--	1.4E+01	2.4E+01	--	--	1.2E+03	2.0E+03	--	--	1.4E+00	2.4E+00	--	--	1.2E+02	2.0E+02	**--**	**--**	**1.2E+02**	**2.0E+02**
2-(2,4,5-Trichlorophenoxy) propionic acid (Silvex)	0	--	--	5.0E+01	--	--	--	2.0E+03	--	--	--	5.0E+00	--	--	--	2.0E+02	--	**--**	**--**	**2.0E+02**	**--**
Vinyl Chloride[c]	0	--	--	2.5E-01	2.4E+01	--	--	2.1E+01	2.0E+03	--	--	2.5E-02	2.4E+00	--	--	2.1E+00	2.0E+02	**--**	**--**	**2.1E+00**	**2.0E+02**
Zinc	3.68	1.8E+02	1.0E+02	7.4E+03	2.6E+04	2.9E+02	3.1E+03	3.0E+05	1.1E+06	2.8E+01	2.8E+01	7.4E+02	2.6E+03	6.2E+02	7.7E+02	3.0E+04	1.1E+05	**2.9E+02**	**7.7E+02**	**3.0E+04**	**1.1E+05**

Notes:

1. All concentrations expressed as micrograms/liter (ug/l), unless noted otherwise
2. Discharge flow is highest monthly average or Form 2C maximum for Industries and design flow for Municipals
3. Metals measured as Dissolved, unless specified otherwise
4. "C" indicates a carcinogenic parameter
5. Regular WLAs are mass balances (minus background concentration) using the % of stream flow entered above under Mixing Information. Antidegradation WLAs are based upon a complete mix.
6. Antideg. Baseline = (0.25(WQC - background conc.) + background conc.) for acute and chronic
   = (0.1(WQC - background conc.) + background conc.) for human health
7. WLAs established at the following stream flows: 1Q10 for Acute, 30Q10 for Chronic Ammonia, 7Q10 for Other Chronic, 30Q5 for Non-carcinogens and Harmonic Mean for Carcinogens. To apply mixing ratios from a model set the stream flow equal to (mixing ratio - 1), effluent flow equal to 1 and 100% mix.

Metal	Target Value (SSTV)
Antimony	2.3E+01
Arsenic	3.9E+01
Barium	8.1E+03
Cadmium	4.6E+00
Chromium III	3.0E+02
Chromium VI	1.1E+01
Copper	1.4E+01
Iron	1.2E+03
Lead	5.0E+01
Manganese	1.6E+02
Mercury	9.2E-01
Nickel	8.0E+01
Selenium	1.3E+01
Silver	5.5E+00
Zinc	1.2E+02

Note: do not use QL's lower than the minimum QL's provided in agency guidance

9/9/2014 4:21:56 PM

Facility = PFRWTA - 18 MGD
Chemical = tPCBs
Chronic averaging period = 4
WLAa =
WLAc = 0.11
Q.L. = 0.00001
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 4
Expected Value = .000727
Variance = .000000
C.V. = 0.6
97th percentile daily values = .001769
97th percentile 4 day average = .001209
97th percentile 30 day average= .000876
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

No Limit is required for this material

The data are:

0.000049925
0.002285053
0.000164221
0.000409189

APPENDIX E

DISSOLVED OXYGEN MODELING

2014
2009
1999

9.0 MGD Design Flow

18.0 MGD Design Flow

MEMORANDUM
VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY
WATER DIVISION
Blue Ridge Regional Office

Subject: Dissolved Oxygen Modeling for Pepper's Ferry Regional Wastewater Treatment Authority – VPDES Permit VA0062685

To: Permit File

From: Bob Tate, Water Permit Writer

Date: March 5, 2014

Attachments: 2014 DO modeling documentation;
2009 DO modeling documentation;
1999 DO modeling documentation

This memo explains rationale for dissolved oxygen (DO) modeling used for reissuance of VPDES Permit VA0062685. DO modeling is essentially the same as modeling used for permit reissuance in 2009. Input data are identical to 2009 DO modeling except for channel cross section and effluent TKN. Observations of the New River at the discharge point on February 7, 2014, indicated that *rectangular* cross section is more appropriate than *irregular* cross section. Recent TKN application monitoring values (max 1.11 mg/L) are considerably lower than in 2009 (max 9.86 mg/L). This model uses 12 mg/L for a more conservative analysis that is also more consistent with the way ammonia is evaluated for reasonable potential analysis. GM00-2011 assumes a single effluent ammonia datum of 9.0 mg/L for reasonable potential analysis. Adding 3 mg/L for organic nitrogen results in a TKN value of 12 mg/L. (TKN = ammonia nitrogen + total organic nitrogen).

Other input data was obtained as described in the following two paragraphs.

Effluent BOD (30 mg/L) is the permitted monthly average limit. Stream BOD (2 mg/L) is determined by the models. Effluent DO (6.0 mg/L) is the permitted minimum limit. Steam DO (7.298 mg/L) is calculated by the models. Effluent temperature (23 ^{O}C) is the 90th percentile annual temperature. Stream temperature (23 ^{O}C) is the 90th percentile annual temperature (22.9 ^{O}C) rounded to the nearest degree. Drainage area (2,791 mi^2) is from flow frequency determinations. Stream segment length (1.83 mi) and elevations (1691.4 ft and 1682.4 ft) are from the USGS Radford North quadrangle topographic map. Steam width (475 ft) and channel characteristics are from observations at site visits February 7, 2014 and April 29, 2009 and from aerial photos on DEQ's GIS site. Stream depth and velocity are calculated by the models.

7Q10 stream flow (546 MGD) is from flow frequency determinations. 7Q10 flow conservatively accounts for stream withdrawals at Radford Army Ammunition Plant's #1 intake and at NRV Regional Water Authority's (formerly Blacksburg-Christiansburg-VPI Water Authority) intake, and discharge from the Christiansburg WWTP. (See flow frequency documentation for details.) DO is evaluated for 9.0 MGD and 18.0 MGD design flows. 9.0 MGD is the original and current design flow. Consequently antidegradation applies only to the 18.0 MGD model.

Output data predict that acceptable DO is maintained at 9.0 MGD and 18.0 MGD discharge flows. Minimum DO for 9.0 MGD discharge (7.277 mg/L) occurs immediately, 0 miles downstream of discharge. Minimum DO for 18.0 MGD discharge (7.256 mg/L) occurs 0.0-0.8 miles downstream of discharge. Class IV DO water quality criteria are 4.0 mg/L minimum and 5.0 mg/L daily average. Thus instream DO should protected by current BOD limits (30 mg/L monthly average, 45 mg/L maximum weekly average) in combination with the current DO limit (minimum 6.0 mg/L).

2014 and 2009 DO models are significantly different from the DO model used for permit reissuance in 1999. One difference is DEQ's Regional Model for Free Flowing Streams program was revised in 2001 (version 4.11). The two versions produce different results with identical data. Another difference is 2009 and 2014 models demonstrates DO in only one stream segment (the first segment in the 1999 model). Only one segment is needed because DO never decreases.

```
"Model Run For I:\rstate\Peppers Ferry Regional WTA\2014 reissuance\DO Model for 9.0
MGD.mod On 3/4/2014 1:59:05 PM"

"Model is for NEW RIVER."
"Model starts at the PFRWTA OUTFALL 001 discharge."

"Background Data"
"7Q10",  "cBOD5",  "TKN",     "DO",      "Temp"
"(mgd)", "(mg/l)", "(mg/l)", "(mg/l)", "deg C"
546,     2,        0,        7.298,    23

"Discharge/Tributary Input Data for Segment 1"
"Flow",  "cBOD5",  "TKN",     "DO",      "Temp"
"(mgd)", "(mg/l)", "(mg/l)", "(mg/l)", "deg C"
9,       30,       12,       ,6,       23

"Hydraulic Information for Segment 1"
"Length","Width",  "Depth",  "Velocity"
"(mi)",  "(ft)",   "(ft)",   "(ft/sec)"
1.83,    474.999,  2.939,    .615

"Initial Mix Values for Segment 1"
"Flow",  "DO",     "cBOD",   "nBOD",   "DOSat",  "Temp"
"(mgd)", "(mg/l)", "(mg/l)", "(mg/l)", "(mg/l)", "deg C"
555,     7.277,    6.135,    .632,     8.11,     23

"Rate Constants for Segment 1. - (All units Per Day)"
"k1",  "k1@T", "k2",   "k2@T", "kn",   "kn@T", "BD",   "BD@T"
.3,    .344,   2.951,  3.168,  .15,    .189,   0,      0

"Output for Segment 1"
"Segment starts at PFRWTA OUTFALL 001"
"Total", "Segm."
"Dist.", "Dist.",  "DO",     "cBOD",   "nBOD"
"(mi)",  "(mi)",   "(mg/l)", "(mg/l)", "(mg/l)"
0,       0,        7.277,    6.135,    .632
.1,      .1,       7.281,    6.114,    .631
.2,      .2,       7.285,    6.093,    .63
.3,      .3,       7.289,    6.072,    .629
.4,      .4,       7.293,    6.051,    .628
.5,      .5,       7.297,    6.03,     .627
.6,      .6,       7.299,    6.009,    .626
.7,      .7,       7.299,    5.988,    .625
.8,      .8,       7.299,    5.968,    .624
.9,      .9,       7.299,    5.948,    .623
1,       1,        7.299,    5.928,    .622
1.1,     1.1,      7.299,    5.908,    .621
1.2,     1.2,      7.299,    5.888,    .62
1.3,     1.3,      7.299,    5.868,    .619
1.4,     1.4,      7.299,    5.848,    .618
1.5,     1.5,      7.299,    5.828,    .617
1.6,     1.6,      7.299,    5.808,    .616
1.7,     1.7,      7.299,    5.788,    .615
1.8,     1.8,      7.299,    5.768,    .614
1.83,    1.83,     7.299,    5.762,    .614


"END OF FILE"
```

REGIONAL MODELING SYSTEM VERSION 4.0

Model Input File for the Discharge to NEW RIVER.

File Information

File Name:	I:\rstate\Peppers Ferry Regional WTA\2014 reissuance\DO Model for 9.0 M
Date Modified:	March 04, 2014

Water Quality Standards Information

Stream Name:	NEW RIVER
River Basin:	New River Basin
Section:	2a
Class:	IV - Mountainous Zones Waters
Special Standards:	PWS, v

Background Flow Information

Gauge Used:	calculated flow at discharge point
Gauge Drainage Area:	2791 Sq.Mi.
Gauge 7Q10 Flow:	546 MGD
Headwater Drainage Area:	0 Sq.Mi.
Headwater 7Q10 Flow:	546 MGD (Net; includes Withdrawals/Discharges)
Withdrawal/Discharges:	0 MGD
Incremental Flow in Segments:	0.1956288 MGD/Sq.Mi.

Background Water Quality

Background Temperature:	23 Degrees C
Background cBOD5:	2 mg/l
Background TKN:	0 mg/l
Background D.O.:	7.297739 mg/l

Model Segmentation

Number of Segments:	1
Model Start Elevation:	1691.4 ft above MSL
Model End Elevation:	1682.4 ft above MSL

REGIONAL MODELING SYSTEM VERSION 4.0

Model Input File for the Discharge to NEW RIVER.

Segment Information for Segment 1

Definition Information

Segment Definition:	A discharge enters.
Discharge Name:	PFRWTA OUTFALL 001
VPDES Permit No.:	

Discharger Flow Information

Flow:	9 MGD
cBOD5:	30 mg/l
TKN:	12 mg/l
D.O.:	6 mg/l
Temperature:	23 Degrees C

Geographic Information

Segment Length:	1.83 miles
Upstream Drainage Area:	0 Sq.Mi.
Downstream Drainage Area:	0 Sq.Mi.
Upstream Elevation:	1691.4 Ft.
Downstream Elevation:	1682.4 Ft.

Hydraulic Information

Segment Width:	474.999 Ft.
Segment Depth:	2.939 Ft.
Segment Velocity:	0.615 Ft./Sec.
Segment Flow:	555 MGD
Incremental Flow:	0 MGD (Applied at end of segment.)

Channel Information

Cross Section:	Rectangular
Character:	Mostly Straight
Pool and Riffle:	Yes
Percent Pools:	75
Percent Riffles:	25
Pool Depth:	3.5 Ft.
Riffle Depth:	1 Ft.
Bottom Type:	Large Rock
Sludge:	None
Plants:	None
Algae:	Only On Edges

```
"Model Run For I:\rstate\Peppers Ferry Regional WTA\2014 reissuance\DO Model for
18.0 MGD.mod On 3/4/2014 2:15:41 PM"

"Model is for NEW RIVER."
"Model starts at the PFRWTA OUTFALL 001 discharge."

"Background Data"
"7Q10",  "cBOD5",  "TKN",     "DO",      "Temp"
"(mgd)", "(mg/l)", "(mg/l)", "(mg/l)", "deg C"
546,     2,        0,        7.298,     23

"Discharge/Tributary Input Data for Segment 1"
"Flow",  "cBOD5",  "TKN",     "DO",      "Temp"
"(mgd)", "(mg/l)", "(mg/l)", "(mg/l)", "deg C"
18,      30,       12,       ,6,        23

"Hydraulic Information for Segment 1"
"Length","Width",  "Depth",  "Velocity"
"(mi)",  "(ft)",   "(ft)",   "(ft/sec)"
1.83,    475,      2.967,    .619

"Initial Mix Values for Segment 1"
"Flow",  "DO",     "cBOD",   "nBOD",   "DOSat",  "Temp"
"(mgd)", "(mg/l)", "(mg/l)", "(mg/l)", "(mg/l)", "deg C"
564,     7.256,    7.234,    1.244,    8.11,     23

"Rate Constants for Segment 1. - (All units Per Day)"
"k1",  "k1@T", "k2",   "k2@T", "kn",   "kn@T", "BD",   "BD@T"
.3,    .344,   2.951,  3.168,  .15,    .189,   0,      0

"Output for Segment 1"
"Segment starts at PFRWTA OUTFALL 001"
"Total", "Segm."
"Dist.", "Dist.",  "DO",     "cBOD",   "nBOD"
"(mi)",  "(mi)",   "(mg/l)", "(mg/l)", "(mg/l)"
0,       0,        7.256,    7.234,    1.244
.1,      .1,       7.256,    7.209,    1.242
.2,      .2,       7.256,    7.185,    1.24
.3,      .3,       7.256,    7.161,    1.238
.4,      .4,       7.256,    7.137,    1.236
.5,      .5,       7.256,    7.113,    1.234
.6,      .6,       7.256,    7.089,    1.232
.7,      .7,       7.256,    7.065,    1.23
.8,      .8,       7.256,    7.041,    1.228
.9,      .9,       7.257,    7.017,    1.226
1,       1,        7.258,    6.993,    1.224
1.1,     1.1,      7.259,    6.969,    1.222
1.2,     1.2,      7.26,     6.945,    1.22
1.3,     1.3,      7.261,    6.921,    1.218
1.4,     1.4,      7.262,    6.898,    1.216
1.5,     1.5,      7.263,    6.875,    1.214
1.6,     1.6,      7.264,    6.852,    1.212
1.7,     1.7,      7.265,    6.829,    1.21
1.8,     1.8,      7.266,    6.806,    1.208
1.83,    1.83,     7.266,    6.799,    1.207


"END OF FILE"
```

REGIONAL MODELING SYSTEM VERSION 4.0

Model Input File for the Discharge to NEW RIVER.

File Information

File Name:	I:\rstate\Peppers Ferry Regional WTA\2014 reissuance\DO Model for 18.0 M
Date Modified:	March 04, 2014

Water Quality Standards Information

Stream Name:	NEW RIVER
River Basin:	New River Basin
Section:	2a
Class:	IV - Mountainous Zones Waters
Special Standards:	PWS, v

Background Flow Information

Gauge Used:	calculated flow at discharge point
Gauge Drainage Area:	2791 Sq.Mi.
Gauge 7Q10 Flow:	546 MGD
Headwater Drainage Area:	0 Sq.Mi.
Headwater 7Q10 Flow:	546 MGD (Net; includes Withdrawals/Discharges)
Withdrawal/Discharges:	0 MGD
Incremental Flow in Segments:	0.1956288 MGD/Sq.Mi.

Background Water Quality

Background Temperature:	23 Degrees C
Background cBOD5:	2 mg/l
Background TKN:	0 mg/l
Background D.O.:	7.297739 mg/l

Model Segmentation

Number of Segments:	1
Model Start Elevation:	1691.4 ft above MSL
Model End Elevation:	1682.4 ft above MSL

REGIONAL MODELING SYSTEM VERSION 4.0

Model Input File for the Discharge to NEW RIVER.

Segment Information for Segment 1

Definition Information

Segment Definition:	A discharge enters.
Discharge Name:	PFRWTA OUTFALL 001
VPDES Permit No.:	

Discharger Flow Information

Flow:	18 MGD
cBOD5:	30 mg/l
TKN:	12 mg/l
D.O.:	6 mg/l
Temperature:	23 Degrees C

Geographic Information

Segment Length:	1.83 miles
Upstream Drainage Area:	0 Sq.Mi.
Downstream Drainage Area:	0 Sq.Mi.
Upstream Elevation:	1691.4 Ft.
Downstream Elevation:	1682.4 Ft.

Hydraulic Information

Segment Width:	475 Ft.
Segment Depth:	2.967 Ft.
Segment Velocity:	0.619 Ft./Sec.
Segment Flow:	564 MGD
Incremental Flow:	0 MGD (Applied at end of segment.)

Channel Information

Cross Section:	Rectangular
Character:	Mostly Straight
Pool and Riffle:	Yes
Percent Pools:	75
Percent Riffles:	25
Pool Depth:	3.5 Ft.
Riffle Depth:	1 Ft.
Bottom Type:	Large Rock
Sludge:	None
Plants:	None
Algae:	Only On Edges

MEMORANDUM

DEPARTMENT OF ENVIRONMENTAL QUALITY - WATER DIVISION
Blue Ridge Regional Office
3019 Peters Creek Road Roanoke, Virginia 24019

SUBJECT Dissolved Oxygen Model
Pepper s Ferry Regional Wastewater Treatment Authority – VA0062685

TO Permit File

FROM Bob Tate, BRRO RST

DATE July 2, 2009

This memo explains rationale for the dissolved oxygen (DO) model used for reissuance of VPDES permit VA0062685

This DO model is significantly different from the DO model used for permit reissuance in 1999 One difference is DEQ s Regional Model for Free Flowing Streams program was revised in 2001 (version 4 11) The two versions produce different results with identical data Another difference is this model demonstrates DO in only one stream segment (the first segment in the 1999 model) Only one segment is needed because DO increases throughout the segment

Input data were the identical to the 1999 DO model with these exceptions 7Q10 flow, cBOD, TKN 7Q10 flow (564 MGD) is lower than that used in 1999 (569 MGD) For cBOD, this model uses the entire permit limit (30 mg/L) instead of 5/6 of the permit limit (25 mg/L) used in 1999 For TKN, this model uses 9 86 mg/L instead of 20 mg/L 9 86 is the highest TKN value in 15 monitoring events conducted from November 2007 to February 2009

Background data were similar to the 1999 DO model Background cBOD were 2 0 (2009) and 5 0 (1999) Temperatures were 23 0 °C (2009) and 23 2 °C (1999) DO were 7 298 (2009) and 7 274 (1999) both calculated by the respective programs

Instead of having the program determine flow at the discharge point, 7Q10 stream flow from the flow frequency determination is used This provides more consistency between the DO model and flow frequency determinations 7Q10 flow conservatively accounts for stream withdrawals at Radford Army Ammunition Plant s #1 intake and at Blacksburg Christiansburg-VPI Water Authority s intake, and discharge from the Christiansburg WWTP (See flow frequency documentation for details)

DO was evaluated for 9 0 MGD and 18 0 MGD design flows 9 0 MGD is the original and current design flow Consequently antidegradation applies only to the 18 0 MGD model

Output data (attached) predict that acceptable DO is maintained at 9 0 MGD and 18 0 MGD discharge flows Minimum DO for 9 0 MGD discharge (7 277 mg/L) occurs 0 miles downstream of discharge Minimum DO for 18 0 MGD discharge (7 256 mg/L) occurs 0 0 0 2 miles downstream of discharge The appropriate (Class IV) DO water quality criteria are 4 0 mg/L minimum and 5 0 mg/L daily average

Attached 2009 DO model input and output data
1999 DO model documentation

Model Run For I \rstate\Peppers Ferry\VPDES permitting\9 MGD mod On 7/2/2009
9 51 25 AM

Model is for NEW RIVER
Model starts at the PEPPER'S FERRY OUTFALL 001 discharge

Background Data

7Q10", (mgd)	cBOD5 (mg/l)	TKN , (mg/l) ,	DO (mg/l)	Temp deg C
546	2	0,	7 298	23

Discharge/Tributary Input Data for Segment 1

Flow , (mgd)	cBOD5 (mg/l)	TKN', (mg/l)	DO (mg/l)	Temp deg C
9	30,	9 86	,6,	23

Hydraulic Information for Segment 1

Length (mi)	Width , (ft) ,	Depth (ft)	Velocity (ft/sec)
1 83,	475	2 924,	618

Initial Mix Values for Segment 1

Flow (mgd)	DO (mg/l)	cBOD , (mg/l) ,	nBOD (mg/l)	DOSat (mg/l)	Temp deg C
555	7 277	6 135	482	8 11,	23

Rate Constants for Segment 1 - (All units Per Day)

k1	k1@T ,	k2	k2@T	kn ,	kn@T	BD'	BD@T
3	344	2 951	3 168,	15	189	0	0

Output for Segment 1
Segment starts at PEPPER S FERRY OUTFALL 001

Total Dist (mi)	Segm Dist (mi) ,	DO (mg/l)	cBOD (mg/l)	nBOD (mg/l)
0	0	7 277	6 135,	482
1	1,	7 281	6 114,	481
2,	2	7 285,	6 093	48
3	3	7 289	6 072	479
4,	4	7 293	6 051	478
5	5	7 297	6 03	477
6	6,	7 299	6 01	476
7	7,	7 299	5 99,	475
8	8,	7 299	5 97,	474
9	9	7 299,	5 95	473
1,	1	7 299	5 93	472
1 1	1 1,	7 299	5 91	471
1 2	1 2	7 299	5 89	47
1 3	1 3	7 299	5 87	469
1 4	1 4	7 299	5 85,	468
1 5	1 5	7 299	5 83	467
1 6	1 6	7 299	5 81	466
1 7	1 7	7 299	5 79	465
1 8,	1 8	7 299,	5 77,	464
1 83	1 83,	7 299	5 764	464

END OF FILE

REGIONAL MODELING SYSTEM VERSION 4 0
Model Input File for the Discharge to NEW RIVER

File Information

File Name	I \rstate\Peppers Ferry\VPDES permitting\9 MGD mod
Date Modified	July 02 2009

Water Quality Standards Information

Stream Name	NEW RIVER
River Basin	New River Basin
Section	2a
Class	IV Mountainous Zones Waters
Special Standards	PWS v

Background Flow Information

Gauge Used	calculated flow at discharge point Pepper s Fery Outfall 001
Gauge Drainage Area	2791 Sq Mi
Gauge 7Q10 Flow	546 MGD
Headwater Drainage Area	0 Sq Mi
Headwater 7Q10 Flow	546 MGD (Net includes Withdrawals/Discharges)
Withdrawal/Discharges	0 MGD
Incremental Flow in Segments	0 1956288 MGD/Sq Mi

Background Water Quality

Background Temperature	23 Degrees C
Background cBOD5	2 mg/l
Background TKN	0 mg/l
Background D O	7 297739 mg/l

Model Segmentation

Number of Segments	1
Model Start Elevation	1691 4 ft above MSL
Model End Elevation	1682 4 ft above MSL

REGIONAL MODELING SYSTEM VERSION 4 0
Model Input File for the Discharge to NEW RIVER

Segment Information for Segment 1

Definition Information	
Segment Definition	A discharge enters
Discharge Name	PEPPER S FERRY OUTFALL 001
VPDES Permit No	
Discharger Flow Information	
Flow	9 MGD
cBOD5	30 mg/l
TKN	9 86 mg/l
D O	6 mg/l
Temperature	23 Degrees C
Geographic Information	
Segment Length	1 83 miles
Upstream Drainage Area	0 Sq Mi
Downstream Drainage Area	0 Sq Mi
Upstream Elevation	1691 4 Ft
Downstream Elevation	1682 4 Ft
Hydraulic Information	
Segment Width	475 Ft
Segment Depth	2 924 Ft
Segment Velocity	0 618 Ft /Sec
Segment Flow	555 MGD
Incremental Flow	0 MGD (Applied at end of segment)
Channel Information	
Cross Section	Irregular
Character	Mostly Straight
Pool and Riffle	Yes
Percent Pools	75
Percent Riffles	25
Pool Depth	3 5 Ft
Riffle Depth	1 Ft
Bottom Type	Large Rock
Sludge	None
Plants	None
Algae	Only On Edges

Model Run For I \rstate\Peppers Ferry\VPDES permitting\18 MGD mod On 7/2/2009
9 49 01 AM

Model is for NEW RIVER
Model starts at the PEPPER S FERRY OUTFALL 001 discharge

Background Data

7Q10" (mgd)	cBOD5 (mg/l)	TKN (mg/l)	DO , (mg/l)	Temp deg C
546	2,	0	7 298,	23

Discharge/Tributary Input Data for Segment 1

Flow (mgd)	cBOD5 (mg/l)	TKN (mg/l) ,	DO (mg/l)	Temp deg C
18	30,	9 86	6	23

Hydraulic Information for Segment 1

Length (mi)	Width , (ft)	Depth , (ft)	"Velocity (ft/sec)
1 83	475 001,	2 952,	622

Initial Mix Values for Segment 1

Flow (mgd)	DO (mg/l)	cBOD (mg/l)	nBOD , (mg/l)	DOSat (mg/l)	Temp deg C
564	7 256	7 234	948	8 11	23

Rate Constants for Segment 1 - (All units Per Day)

k1	k1@T	k2 ,	k2@T ,	kn ,	kn@T	BD'	BD@T
3,	344,	2 951,	3 168,	15,	189,	0	0

Output for Segment 1
Segment starts at PEPPER S FERRY OUTFALL 001

Total Dist (mi)	Segm Dist (mi) ,	DO (mg/l) ,	cBOD (mg/l) ,	nBOD (mg/l)
0	0	7 256,	7 234,	948
1,	1,	7 256	7 21	946
2	2	7 256	7 186	944
3,	3	7 257,	7 162,	942
4,	4	7 258	7 138	94
5,	5	7 259	7 114	938
6	6	7 26	7 09	936
7	7	7 261,	7 066	934
8	8	7 262	7 042	932
9,	9	7 263	7 018,	93
1	1	7 264	6 994	928
1 1,	1 1,	7 265,	6 97	926
1 2	1 2	7 266	6 946	924
1 3	1 3	7 267	6 923	922
1 4	1 4	7 268	6 9	92
1 5	1 5	7 269	6 877,	918
1 6	1 6	7 27	6 854	916
1 7	1 7,	7 271,	6 831	914
1 8	1 8	7 272	6 808	912
1 83,	1 83,	7 272	6 801,	911

END OF FILE

REGIONAL MODELING SYSTEM VERSION 4 0
Model Input File for the Discharge to NEW RIVER

File Information

File Name	I \rstate\Peppers Ferry\VPDES permitting\18 MGD mod
Date Modified	July 02 2009

Water Quality Standards Information

Stream Name	NEW RIVER
River Basin	New River Basin
Section	2a
Class	IV Mountainous Zones Waters
Special Standards	PWS v

Background Flow Information

Gauge Used	calculated flow at discharge point Pepper s Fery Outfall 001
Gauge Drainage Area	2791 Sq Mi
Gauge 7Q10 Flow	546 MGD
Headwater Drainage Area	0 Sq Mi
Headwater 7Q10 Flow	546 MGD (Net includes Withdrawals/Discharges)
Withdrawal/Discharges	0 MGD
Incremental Flow in Segments	0 1956288 MGD/Sq Mi

Background Water Quality

Background Temperature	23 Degrees C
Background cBOD5	2 mg/l
Background TKN	0 mg/l
Background D O	7 297739 mg/l

Model Segmentation

Number of Segments	1
Model Start Elevation	1691 4 ft above MSL
Model End Elevation	1682 4 ft above MSL

REGIONAL MODELING SYSTEM VERSION 4 0
Model Input File for the Discharge to NEW RIVER

Segment Information for Segment 1

Definition Information	
Segment Definition	A discharge enters
Discharge Name	PEPPER S FERRY OUTFALL 001
VPDES Permit No	
Discharger Flow Information	
Flow	18 MGD
cBOD5	30 mg/l
TKN	9 86 mg/l
D O	6 mg/l
Temperature	23 Degrees C
Geographic Information	
Segment Length	1 83 miles
Upstream Drainage Area	0 Sq Mi
Downstream Drainage Area	0 Sq Mi
Upstream Elevation	1691 4 Ft
Downstream Elevation	1682 4 Ft
Hydraulic Information	
Segment Width	475 001 Ft
Segment Depth	2 952 Ft
Segment Velocity	0 622 Ft /Sec
Segment Flow	564 MGD
Incremental Flow	0 MGD (Applied at end of segment)
Channel Information	
Cross Section	Irregular
Character	Mostly Straight
Pool and Riffle	Yes
Percent Pools	75
Percent Riffles	25
Pool Depth	3 5 Ft
Riffle Depth	1 Ft
Bottom Type	Large Rock
Sludge	None
Plants	None
Algae	Only On Edges

Pepper's Ferry Regional Wastewater Treatment Authority
Nutrient Monitoring Database

Regional Facility Effluent

Date	Flow	P	P/lbs	Ortho P	OP/lbs	TKN	TKN/lbs	NH3	NH3/lbs	NO2	NO2/lbs	NO3	No3/lbs
11/1/2007	3 63	2 55	35	1 47	20	9 86	135	0 050	0 6870	0 025	0 3435	16 9	232
1/6/2008	3 19		0		0		0	0 370	4 4674		0 0000		0
1/15/2008	4 21	2 34	37	1 79	29	4 03	64	0 050	0 7967	0 025	0 3984	16 2	258
4/9/2008	4 70	2 47	44	0 71	13	1 1	20	0 015	0 2668	0 025	0 4447	10 6	189
4/17/2008	3 99	3 92	59	2 50	38	2 0	30	0 015	0 2265	0 025	0 3776	20 0	302
5/15/2008	3 77	3 65	52	0 87	12	1 8	26	0 500	7 1347	0 025	0 3567	20 7	295
5/27/2008	3 16	5 20	62	1 21	14	1 7	20	0 040	0 4784	0 025	0 2990	16 8	201
6/20/2008	2 72	3 86	40	1 00	10	3 1	32	0 160	1 6472	0 025	0 2574	18 6	191
7/9/2008	3 76	3 89	55	2 18	31	0 42	6	0 070	0 9962	0 025	0 3558	15 1	215
7/15/2008	2 81	3 10	33	1 09	12	0 42	4	0 050	0 5318	0 025	0 2659	14 9	158
8/20/2008	3 04	4 33	50	3 42	39	1 5	17	0 090	1 0356	0 380	4 3724	20 8	239
9/3/2008	3 91	3 75	55	0 6	9	0 42	6	0 015	0 2220	0 025	0 3700	18 3	271
10/3/2008	3 6	6 35	87	4 55	62	2 6	35	0 015	0 2044	0 025	0 3407	20 0	273
11/12/2008	3 35	4 73	60	3 08	39	2 3	29	0 050	0 6340	0 025	0 3170	24 3	308
12/18/2008	4 58	2 32	40	1 53	27	1 5	26	0 040	0 6934	0 025	0 4334	15 3	265
1/21/2009	3 47					1 1	14	0 040	0 5254	0 025	0 3283	18 3	240
2/4/2009	3 84	2 44	35	1 68	24								
			0		0		0		0 0000		0 0000		0
			0		0		0		0 0000		0 0000		0
			0		0		0		0 0000		0 0000		0
			0		0		0		0 0000		0 0000		0
			0		0		0		0 0000		0 0000		0
			0		0		0		0 0000		0 0000		0
			0		0		0		0 0000		0 0000		0
			0		0		0		0 0000		0 0000		0
			0		0		0		0 0000		0 0000		0
			0		0		0		0 0000		0 0000		0
			0		0		0		0 0000		0 0000		0
			0		0		0		0 0000		0 0000		0
			0		0		0		0 0000		0 0000		0
			0		0		0		0 0000		0 0000		0
			0		0		0		0 0000		0 0000		0

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EVALUATION OF CONVENTIONAL POLLUTANTS

Effluent limitations for TSS at both the 9 0 and 18 0 MGD design flows are in accordance with Federal Effluent Requirements TSS limits for the 9 0 MGD design flow are unchanged

Effluent limitations for pH reflect current Water Quality Standards at the 9 0 and 18 0 MGD design flows pH limits for the 9 0 MGD design flow are unchanged

The analysis of effluent limitations for D O and BOD_5 are based upon Regional Water Quality Model Version 3 2 Four segments were modeled as follows segment 1 from Peppers Ferry Outfall 001 to Radford Army Ammunition Plant (RAAP) outfall 029 segment 2 from RAAP outfall 029 to RAAP outfall 007/026 segment 3 from RAAP 007/026 to Lower Stroubles Creek WWTP outfall 001 and segment 4 from Lower Stroubles Creek WWTP outfall 001 to one mile downstream of RAAP outfall 028 The segments were modeled on the basis that RAAP outfalls 029 026 and 007 and Lower Stroubles Creek WWTP outfall 001 have the potential to discharge oxygen depleting compounds that could interact with discharges from Peppers Ferry WWTP As RAAP outfalls 007/026 are only 0 04 miles apart they were modeled as one outfall for the purposes of evaluating their impact on D O depletion

D O model assumptions for RAAP outfalls are as follows Flow estimates are based upon maximum 30 day values taken from RAAP s VPDES permit application submitted on January 29 1999 TKN estimates are from the 90th percentile values of TKN data collected by RAAP between 1994 and 1999 at each of the outfalls (copies attached) BOD5 values are based upon effluent limits contained in the current permit converted to cBOD5 at concentration ratio of 5 cBOD5 6 BOD5 and D O concentrations are based on a conservative worst case assumption of '0 mg/l '

Lower Stroubles Creek WWTP model inputs are taken from the current permit limits for BOD5 and D O contained in the current VPDES permit with an expiration date of June 6 2004 TKN concentrations were estimated as 20 mg/l A printout of all model inputs are attached

A copy of model outputs for the 9 0 MGD design flow are attached **The model predicts that secondary limits for BOD_5 in combination with a D O limit of 6 0 mg/l should be protective of numeric criteria for D O required by Water Quality Standards at the 9 0 MGD design flow**

A copy of model outputs for 18 0 MGD design flow are attached **The model predicts that secondary limits for BOD_5 in combination with a D O limit of 6 0 mg/l should be protective of numeric criteria for D O required by Water Quality Standards at the 18 0 MGD design flow and comply with antidegradation requirements** The model establishes a D O concentration baseline of 7 27 mg/l at the Peppers Ferry outfall When compared with existing conditions the D O concentration will ensure that there will not be a D O decrease of more than 0 2 mg/l in any portion of the modeled segments as compared to existing conditions

********** ********** **********

REGIONAL MODELING SYSTEM VERSION 3 2

****

MODEL SIMULATION FOR THE Peppers Ferry STP DISCHARGE

TO New River

COMMENT Existing Conditions -- Peppers Ferry

THE SIMULATION STARTS AT THE Peppers Ferry STP DISCHARGE

********** PROPOSED PERMIT LIMITS **********

FLOW = 9 MGD cBOD5 = 25 Mg/L TKN = 20 Mg/L D O = 6 Mg/L

**** THE MAXIMUM CHLORINE ALLOWABLE IN THE DISCHARGE IS 0 707 Mg/L ****

THE SECTION BEING MODELED IS BROKEN INTO 4 SEGMENTS
RESULTS WILL BE GIVEN AT 0 1 MILE INTERVALS

********** BACKGROUND CONDITIONS **********

THE 7Q10 STREAM FLOW AT THE DISCHARGE IS 569 06744 MGD
THE DISSOLVED OXYGEN OF THE STREAM IS 7 274 Mg/L
THE BACKGROUND cBODu OF THE STREAM IS 5 Mg/L
THE BACKGROUND nBOD OF THE STREAM IS 0 Mg/L

********** MODEL PARAMETERS **********

SEG	LEN Mi	VEL F/S	K2 1/D	K1 1/D	KN 1/D	BENTHIC Mg/L	ELEV Ft	TEMP °C	DO-SAT Mg/L
1	1 83	0 632	2 951	0 300	0 150	0 000	1686 90	23 20	8 082
2	0 22	0 612	2 455	0 300	0 150	0 000	1681 95	23 20	8 084
3	0 22	0 642	3 000	0 300	0 150	0 000	1680 95	23 20	8 084
4	6 13	0 556	1 429	0 300	0 150	0 000	1673 10	23 20	8 086

(The K Rates shown are at 20°C the model corrects them for temperature)

********** RESPONSE FOR SEGMENT 1 **********

TOTAL STREAMFLOW = 578 0674 MGD
(Including Discharge)

DISTANCE FROM HEAD OF SEGMENT (MI)	TOTAL DISTANCE FROM MODEL BEGINNING (MI)	DISSOLVED OXYGEN (Mg/L)	cBODu (Mg/L)	nBODu (Mg/L)
0 000	0 000	7 254	5 895	1 146
0 100	0 100	7 258	5 875	1 144
0 200	0 200	7 261	5 856	1 142
0 300	0 300	7 265	5 836	1 140
0 400	0 400	7 268	5 817	1 138
0 500	0 500	7 272	5 797	1 135
0 600	0 600	7 274	5 778	1 133
0 700	0 700	7 274	5 758	1 131
0 800	0 800	7 274	5 739	1 129
0 900	0 900	7 274	5 720	1 127
1 000	1 000	7 274	5 701	1 125
1 100	1 100	7 274	5 681	1 123
1 200	1 200	7 274	5 662	1 121
1 300	1 300	7 274	5 643	1 119
1 400	1 400	7 274	5 624	1 117
1 500	1 500	7 274	5 606	1 115
1 600	1 600	7 274	5 587	1 112
1 700	1 700	7 274	5 568	1 110
1 800	1 800	7 274	5 549	1 108
1 830	1 830	7 274	5 544	1 108

FOR THE DISCHARGE AT THE END OF SEGMENT 1
DISCHARGER = RAAP -- 029
FLOW = 1 57 MGD cBOD5 = 50 Mg/L TKN = 7 Mg/L D O = 0 Mg/L

FLOW FROM INCREMENTAL DRAINAGE AREA = 0 2447 MGD

********** RESPONSE FOR SEGMENT 2 **********

TOTAL STREAMFLOW = 579 8821 MGD
(Including Discharge Tributaries and Incremental D A Flow)

DISTANCE FROM HEAD OF SEGMENT (MI)	TOTAL DISTANCE FROM MODEL BEGINNING (MI)	DISSOLVED OXYGEN (Mg/L)	cBODu (Mg/L)	nBODu (Mg/L)
0 000	1 830	7 254	5 867	1 151
0 100	1 930	7 254	5 847	1 149
0 200	2 030	7 253	5 826	1 147
0 220	2 050	7 253	5 822	1 146

FOR THE DISCHARGE AT THE END OF SEGMENT 2
DISCHARGER = RAAP -- 007/026
FLOW = 7 36 MGD cBOD5 = 25 Mg/L TKN = 6 Mg/L D O = 0 Mg/L

FLOW FROM INCREMENTAL DRAINAGE AREA = 0 0204 MGD

********** RESPONSE FOR SEGMENT 3 **********

TOTAL STREAMFLOW = 587 2625 MGD
(Including Discharge Tributaries and Incremental D A Flow)

DISTANCE FROM HEAD OF SEGMENT (MI)	TOTAL DISTANCE FROM MODEL BEGINNING (MI)	DISSOLVED OXYGEN (Mg/L)	cBODu (Mg/L)	nBODu (Mg/L)
0 000	2 050	7 162	6 533	1 295
0 100	2 150	7 167	6 511	1 292
0 200	2 250	7 171	6 490	1 290
0 220	2 270	7 172	6 485	1 289

FOR THE DISCHARGE AT THE END OF SEGMENT 3
DISCHARGER = Lower Stroubles Creek STP
FLOW = 9 MGD cBOD5 = 20 Mg/L TKN = 20 Mg/L D O = 6 6 Mg/L

FLOW FROM INCREMENTAL DRAINAGE AREA = 4 5468 MGD

********** RESPONSE FOR SEGMENT 4 **********

TOTAL STREAMFLOW = 600 8093 MGD
(Including Discharge Tributaries and Incremental D A Flow)

DISTANCE FROM HEAD OF SEGMENT (MI)	TOTAL DISTANCE FROM MODEL BEGINNING (MI)	DISSOLVED OXYGEN (Mg/L)	cBODu (Mg/L)	nBODu (Mg/L)
0 000	2 270	7 164	7 126	2 363
0 100	2 370	7 148	7 099	2 358
0 200	2 470	7 132	7 072	2 353
0 300	2 570	7 116	7 045	2 348
0 400	2 670	7 101	7 018	2 343
0 500	2 770	7 086	6 991	2 338
0 600	2 870	7 071	6 964	2 333
0 700	2 970	7 057	6 938	2 328
0 800	3 070	7 043	6 911	2 323
0 900	3 170	7 030	6 885	2 319
1 000	3 270	7 017	6 858	2 314
1 100	3 370	7 004	6 832	2 309
1 200	3 470	6 991	6 806	2 304
1 300	3 570	6 979	6 780	2 299
1 400	3 670	6 968	6 754	2 294
1 500	3 770	6 956	6 728	2 289
1 600	3 870	6 945	6 703	2 284
1 700	3 970	6 934	6 677	2 280
1 800	4 070	6 923	6 652	2 275
1 900	4 170	6 913	6 626	2 270
2 000	4 270	6 903	6 601	2 265
2 100	4 370	6 893	6 576	2 260
2 200	4 470	6 884	6 551	2 256
2 300	4 570	6 874	6 526	2 251
2 400	4 670	6 865	6 501	2 246
2 500	4 770	6 857	6 476	2 241
2 600	4 870	6 848	6 451	2 237
2 700	4 970	6 840	6 427	2 232
2 800	5 070	6 832	6 402	2 227
2 900	5 170	6 824	6 378	2 223
3 000	5 270	6 816	6 353	2 218
3 100	5 370	6 809	6 329	2 213
3 200	5 470	6 802	6 305	2 209
3 300	5 570	6 795	6 281	2 204
3 400	5 670	6 788	6 257	2 199
3 500	5 770	6 782	6 233	2 195
3 600	5 870	6 776	6 209	2 190
3 700	5 970	6 770	6 186	2 185
3 800	6 070	6 764	6 162	2 181
3 900	6 170	6 758	6 139	2 176
4 000	6 270	6 753	6 115	2 172
4 100	6 370	6 748	6 092	2 167
4 200	6 470	6 743	6 069	2 162
4 300	6 570	6 738	6 046	2 158
4 400	6 670	6 733	6 023	2 153
4 500	6 770	6 728	5 999	2 149
4 600	6 870	6 724	5 977	2 144
4 700	6 970	6 720	5 954	2 140

4 800	7 0	6 716	5 ,31	2 135
4 900	7 170	6 712	5 909	2 131
5 000	7 270	6 708	5 886	2 126
5 100	7 370	6 705	5 864	2 122
5 200	7 470	6 701	5 841	2 117
5 300	7 570	6 698	5 819	2 113
5 400	7 670	6 695	5 797	2 108
5 500	7 770	6 692	5 775	2 104
5 600	7 870	6 689	5 753	2 100
5 700	7 970	6 687	5 731	2 095
5 800	8 070	6 684	5 709	2 091
5 900	8 170	6 682	5 687	2 086
6 000	8 270	6 680	5 665	2 082
6 100	8 370	6 677	5 644	2 078
6 130	8 400	6 677	5 637	2 076

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GIONAL MODELING SYSTEM Ver 3 2 (OWRM - 9/90)
,-22-1999 09 25 02

ATA FILE = PEPPERAD MOD

********** ********** **********

REGIONAL MODELING SYSTEM VERSION 3 2

****

MODEL SIMULATION FOR THE Peppers Ferry STP DISCHARGE

TO New River

COMMENT Expansion \D O Analysis -- Peppers ferry

THE SIMULATION STARTS AT THE Peppers Ferry STP DISCHARGE

********** PROPOSED PERMIT LIMITS **********

FLOW = 18 MGD cBOD5 = 25 Mg/L TKN = 20 Mg/L D O = 6 Mg/L

**** THE MAXIMUM CHLORINE ALLOWABLE IN THE DISCHARGE IS 0 359 Mg/L ****

THE SECTION BEING MODELED IS BROKEN INTO 4 SEGMENTS
RESULTS WILL BE GIVEN AT 0 1 MILE INTERVALS

********** BACKGROUND CONDITIONS **********

THE 7Q10 STREAM FLOW AT THE DISCHARGE IS 569 06744 MGD
THE DISSOLVED OXYGEN OF THE STREAM IS 7 274 Mg/L
THE BACKGROUND cBODu OF THE STREAM IS 5 Mg/L
THE BACKGROUND nBOD OF THE STREAM IS 0 Mg/L

********** MODEL PARAMETERS **********

SEG	LEN Mi	VEL F/S	K2 1/D	K1 1/D	KN 1/D	BENTHIC Mg/L	ELEV Ft	TEMP °C	DO-SAT Mg/L
1	1 83	0 632	2 951	0 300	0 150	0 000	1686 90	23 20	8 082
2	0 22	0 612	2 455	0 300	0 150	0 000	1681 95	23 20	8 084
3	0 22	0 642	3 000	0 300	0 150	0 000	1680 95	23 20	8 084
4	6 13	0 556	1 429	0 300	0 150	0 000	1673 10	23 20	8 086

(The K Rates shown are at 20°C the model corrects them for temperature)

Attachment 3/ page 10 of 2

4 800	7 0	6 716	5 931	2 135
4 900	7 170	6 712	5 909	2 131
5 000	7 270	6 708	5 886	2 126
5 100	7 370	6 705	5 864	2 122
5 200	7 470	6 701	5 841	2 117
5 300	7 570	6 698	5 819	2 113
5 400	7 670	6 695	5 797	2 108
5 500	7 770	6 692	5 775	2 104
5 600	7 870	6 689	5 753	2 100
5 700	7 970	6 687	5 731	2 095
5 800	8 070	6 684	5 709	2 091
5 900	8 170	6 682	5 687	2 086
6 000	8 270	6 680	5 665	2 082
6 100	8 370	6 677	5 644	2 078
6 130	8 400	6 677	5 637	2 076

****

'EGIONAL MODELING SYSTEM Ver 3 2 (OWRM - 9/90)
)6-22-1999 09 25 02

)ATA FILE = PEPPERAD MOD

********** RESPONSE FOR SEGMENT 1 **********

Attachment 5/page 9 of 23

TOTAL STREAMFLOW = 587 0674 MGD
(Including Discharge)

DISTANCE FROM HEAD OF SEGMENT (MI)	TOTAL DISTANCE FROM MODEL BEGINNING (MI)	DISSOLVED OXYGEN (Mg/L)	cBODu (Mg/L)	nBODu (Mg/L)
0 000	0 000	7 235	6 763	2 257
0 100	0 100	7 234	6 740	2 253
0 200	0 200	7 233	6 718	2 249
0 300	0 300	7 233	6 695	2 244
0 400	0 400	7 232	6 673	2 240
0 500	0 500	7 232	6 650	2 236
0 600	0 600	7 232	6 628	2 232
0 700	0 700	7 231	6 606	2 228
0 800	0 800	7 231	6 584	2 224
0 900	0 900	7 231	6 562	2 220
1 000	1 000	7 231	6 540	2 215
1 100	1 100	7 232	6 518	2 211
1 200	1 200	7 232	6 496	2 207
1 300	1 300	7 232	6 474	2 203
1 400	1 400	7 232	6 452	2 199
1 500	1 500	7 233	6 431	2 195
1 600	1 600	7 233	6 409	2 191
1 700	1 700	7 234	6 388	2 187
1 800	1 800	7 234	6 366	2 183
1 830	1 830	7 235	6 360	2 181

FOR THE DISCHARGE AT THE END OF SEGMENT 1
DISCHARGER = RAAP -- 029
FLOW = 1 57 MGD cBOD5 = 50 Mg/L TKN = 7 Mg/L D O = 0 Mg/L

FLOW FROM INCREMENTAL DRAINAGE AREA = 0 2447 MGD

********** RESPONSE FOR SEGMENT 2 **********

Attachment 5 page 10 of 2

TOTAL STREAMFLOW = 588 8821 MGD
(Including Discharge Tributaries and Incremental D A Flow)

DISTANCE FROM HEAD OF SEGMENT (MI)	TOTAL DISTANCE FROM MODEL BEGINNING (MI)	DISSOLVED OXYGEN (Mg/L)	cBODu (Mg/L)	nBODu (Mg/L)
0 000	1 830	7 215	6 676	2 221
0 100	1 930	7 211	6 653	2 217
0 200	2 030	7 207	6 629	2 212
0 220	2 050	7 206	6 625	2 212

FOR THE DISCHARGE AT THE END OF SEGMENT 2
DISCHARGER = RAAP -- 007/026
FLOW = 7 36 MGD cBOD5 = 25 Mg/L TKN = 6 Mg/L D O = 0 Mg/L

FLOW FROM INCREMENTAL DRAINAGE AREA = 0 0204 MGD

********** RESPONSE FOR SEGMENT 3 **********

Attachment 5 / page 11 of 23

TOTAL STREAMFLOW = 596 2625 MGD
(Including Discharge Tributaries and Incremental D A Flow)

DISTANCE FROM HEAD OF SEGMENT (MI)	TOTAL DISTANCE FROM MODEL BEGINNING (MI)	DISSOLVED OXYGEN (Mg/L)	cBODu (Mg/L)	nBODu (Mg/L)
0 000	2 050	7 117	7 314	2 345
0 100	2 150	7 118	7 290	2 340
0 200	2 250	7 120	7 266	2 336
0 220	2 270	7 120	7 261	2 335

FOR THE DISCHARGE AT THE END OF SEGMENT 3
DISCHARGER = Lower Stroubles Creek STP
FLOW = 9 MGD cBOD5 = 20 Mg/L TKN = 20 Mg/L D O = 6 6 Mg/L

FLOW FROM INCREMENTAL DRAINAGE AREA = 4 5468 MGD

********** RESPONSE FOR SEGMENT 4 **********

Attachment 5 / page 12 of 23

TOTAL STREAMFLOW = 609 8093 MGD
(Including Discharge Tributaries and Incremental D A Flow)

DISTANCE FROM HEAD OF SEGMENT (MI)	TOTAL DISTANCE FROM MODEL BEGINNING (MI)	DISSOLVED OXYGEN (Mg/L)	cBODu (Mg/L)	nBODu (Mg/L)
0 000	2 270	7 114	7 875	3 370
0 100	2 370	7 093	7 845	3 362
0 200	2 470	7 073	7 815	3 355
0 300	2 570	7 054	7 786	3 348
0 400	2 670	7 035	7 756	3 341
0 500	2 770	7 016	7 726	3 334
0 600	2 870	6 998	7 697	3 327
0 700	2 970	6 980	7 667	3 320
0 800	3 070	6 963	7 638	3 313
0 900	3 170	6 946	7 609	3 306
1 000	3 270	6 929	7 580	3 299
1 100	3 370	6 913	7 551	3 292
1 200	3 470	6 897	7 522	3 285
1 300	3 570	6 882	7 494	3 278
1 400	3 670	6 867	7 465	3 272
1 500	3 770	6 853	7 437	3 265
1 600	3 870	6 838	7 408	3 258
1 700	3 970	6 825	7 380	3 251
1 800	4 070	6 811	7 352	3 244
1 900	4 170	6 798	7 324	3 237
2 000	4 270	6 785	7 296	3 230
2 100	4 370	6 773	7 268	3 224
2 200	4 470	6 761	7 240	3 217
2 300	4 570	6 749	7 213	3 210
2 400	4 670	6 737	7 185	3 203
2 500	4 770	6 726	7 158	3 196
2 600	4 870	6 715	7 130	3 190
2 700	4 970	6 705	7 103	3 183
2 800	5 070	6 694	7 076	3 176
2 900	5 170	6 684	7 049	3 170
3 000	5 270	6 675	7 022	3 163
3 100	5 370	6 665	6 996	3 156
3 200	5 470	6 656	6 969	3 149
3 300	5 570	6 647	6 942	3 143
3 400	5 670	6 639	6 916	3 136
3 500	5 770	6 630	6 889	3 130
3 600	5 870	6 622	6 863	3 123
3 700	5 970	6 614	6 837	3 116
3 800	6 070	6 607	6 811	3 110
3 900	6 170	6 599	6 785	3 103
4 000	6 270	6 592	6 759	3 097
4 100	6 370	6 585	6 733	3 090
4 200	6 470	6 578	6 707	3 084
4 300	6 570	6 572	6 682	3 077
4 400	6 670	6 566	6 656	3 071
4 500	6 770	6 560	6 631	3 064
4 600	6 870	6 554	6 606	3 058
4 700	6 970	6 548	6 580	3 051

4 800	7 0	6 543	6 55	3 045
4 900	7 170	6 538	6 530	3 039
5 000	7 270	6 533	6 505	3 032
5 100	7 370	6 528	6 481	3 026
5 200	7 470	6 523	6 456	3 019
5 300	7 570	6 519	6 431	3 013
5 400	7 670	6 515	6 407	3 007
5 500	7 770	6 510	6 382	3 000
5 600	7 870	6 507	6 358	2 994
5 700	7 970	6 503	6 334	2 988
5 800	8 070	6 499	6 310	2 981
5 900	8 170	6 496	6 286	2 975
6 000	8 270	6 493	6 261	2 969
6 100	8 370	6 490	6 238	2 963
6 130	8 400	6 489	6 231	2 961

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EGIONAL MODELING SYSTEM Ver 3 2 (OWRM - 9/90)
6-22-1999 09 25 57

ATA FILE = PEPPERAD MOD

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REGIONAL MODELING SYSTEM VERSION 3 2

DATA FILE SUMMARY

****

THE NAME OF THE DATA FILE IS PEPPERAD MOD

THE STREAM NAME IS New River
THE RIVER BASIN IS New River
THE SECTION NUMBER IS 2
THE CLASSIFICATION IS IV

STANDARDS VIOLATED (Y/N) = N
STANDARDS APPROPRIATE (Y/N) = Y

DISCHARGE WITHIN 3 MILES (Y/N) = N

THE DISCHARGE BEING MODELED IS Peppers Ferry STP

PROPOSED LIMITS ARE
FLOW = 18 MGD
BOD5 = 25 MG/L
TKN = 20 MG/L
D O = 6 MG/L

THE NUMBER OF SEGMENTS TO BE MODELED = 4

7Q10 WILL BE CALCULATED BY DRAINAGE AREA COMPARISON
THE GAUGE NAME IS New River -- Radford Route 11 bridge
GAUGE DRAINAGE AREA = 2748 SQ MI
GAUGE 7Q10 = 560 3 MGD
DRAINAGE AREA AT DISCHARGE = 2791 SQ MI

STREAM A DRY DITCH AT DISCHARGE (Y/N) = N
ANTIDEGRADATION APPLIES (Y/N) = Y

ALLOCATION DESIGN TEMPERATURE = 23 2 °C

Attachment 5
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SEGMENT INFORMATION

####### SEGMENT # 1 #######

SEGMENT ENDS BECAUSE A DISCHARGE ENTERS AT END

SEGMENT LENGTH = 1 83 MI

SEGMENT WIDTH = 475 FT
SEGMENT DEPTH = 2 9 FT
SEGMENT VELOCITY = 65 FT/SEC

DRAINAGE AREA AT SEGMENT START = 2791 4 SQ MI
DRAINAGE AREA AT SEGMENT END = 2792 6 SQ MI

ELEVATION AT UPSTREAM END = 1691 4 FT
ELEVATION AT DOWNSTREAM END = 1682 4 FT

THE CROSS SECTION IS IRREGULAR
THE CHANNEL IS MOSTLY STRAIGHT

POOLS AND RIFFLES (Y/N) = Y
THE SEGMENT LENGTH IS 75 ~ POOLS
POOL DEPTH = 4 FT
THE SEGMENT LENGTH IS 25 ~ RIFFLES
RIFFLE DEPTH = 1 FT

THE BOTTOM TYPE = LARGE ROCK
SLUDGE DEPOSITS = NONE
AQUATIC PLANTS = NONE
ALGAE OBSERVED = VISIBLE ONLY ON EDGES
WATER COLORED GREEN (Y/N) = N

THE DISCHARGE AT THE SEGMENT END IS RAAP -- 029

ITS CONCENTRATIONS ARE
FLOW = 1 57 MGD
BOD5 = 50 MG/L
TKN = 7 MG/L
D O = 0 MG/L

Attachment 5
Page 16 of 2

SEGMENT INFORMATION

####### SEGMENT # 2 #######

SEGMENT ENDS BECAUSE A DISCHARGE ENTERS AT END

SEGMENT LENGTH = 22 MI

SEGMENT WIDTH = 500 FT
SEGMENT DEPTH = 3 FT
SEGMENT VELOCITY = 65 FT/SEC

DRAINAGE AREA AT SEGMENT START = 2792 6 SQ MI
DRAINAGE AREA AT SEGMENT END = 2792 7 SQ MI

ELEVATION AT UPSTREAM END = 1682 4 FT
ELEVATION AT DOWNSTREAM END = 1681 5 FT

THE CROSS SECTION IS IRREGULAR
THE CHANNEL IS MOSTLY STRAIGHT

POOLS AND RIFFLES (Y/N) = Y
THE SEGMENT LENGTH IS 75 ~ POOLS
POOL DEPTH = 4 FT
THE SEGMENT LENGTH IS 25 ~ RIFFLES
RIFFLE DEPTH = 1 FT

THE BOTTOM TYPE = LARGE ROCK
SLUDGE DEPOSITS = NONE
AQUATIC PLANTS = NONE
ALGAE OBSERVED = VISIBLE ONLY ON EDGES
WATER COLORED GREEN (Y/N) = N

THE DISCHARGE AT THE SEGMENT END IS RAAP -- 007/026

ITS CONCENTRATIONS ARE
FLOW = 7 36 MGD
BOD5 = 25 MG/L
TKN = 6 MG/L
D O = 0 MG/L

SEGMENT INFORMATION

####### SEGMENT # 3 #######

SEGMENT ENDS BECAUSE A DISCHARGE ENTERS AT END

SEGMENT LENGTH = 22 MI

SEGMENT WIDTH = 500 FT
SEGMENT DEPTH = 3 FT
SEGMENT VELOCITY = 65 FT/SEC

DRAINAGE AREA AT SEGMENT START = 2792 7 SQ MI
DRAINAGE AREA AT SEGMENT END = 2815 SQ MI

ELEVATION AT UPSTREAM END = 1681 5 FT
ELEVATION AT DOWNSTREAM END = 1680 4 FT

THE CROSS SECTION IS IRREGULAR
THE CHANNEL IS MOSTLY STRAIGHT

POOLS AND RIFFLES (Y/N) = Y
THE SEGMENT LENGTH IS 75 - POOLS
POOL DEPTH = 4 FT
THE SEGMENT LENGTH IS 25 - RIFFLES
RIFFLE DEPTH = 1 FT

THE BOTTOM TYPE = LARGE ROCK
SLUDGE DEPOSITS = NONE
AQUATIC PLANTS = NONE
ALGAE OBSERVED = VISIBLE ONLY ON EDGES
WATER COLORED GREEN (Y/N) = N

THE DISCHARGE AT THE SEGMENT END IS Lower Stroubles Creek STP

ITS CONCENTRATIONS ARE
FLOW = 9 MGD
BOD5 = 20 MG/L
TKN = 20 MG/L
D O = 6 6 MG/L

Attachment 5
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SEGMENT INFORMATION

####### SEGMENT # 4 #######

SEGMENT ENDS BECAUSE THE MODEL ENDS

SEGMENT LENGTH = 6 13 MI

SEGMENT WIDTH = 525 FT
SEGMENT DEPTH = 3 25 FT
SEGMENT VELOCITY = 65 FT/SEC

DRAINAGE AREA AT SEGMENT START = 2815 SQ MI
DRAINAGE AREA AT SEGMENT END = 2872 SQ MI

ELEVATION AT UPSTREAM END = 1680 4 FT
ELEVATION AT DOWNSTREAM END = 1665 8 FT

THE CROSS SECTION IS IRREGULAR
THE CHANNEL IS MOSTLY STRAIGHT

POOLS AND RIFFLES (Y/N) = Y
THE SEGMENT LENGTH IS 75 - POOLS
POOL DEPTH = 4 FT
THE SEGMENT LENGTH IS 25 - RIFFLES
RIFFLE DEPTH = 1 FT

THE BOTTOM TYPE = LARGE ROCK
SLUDGE DEPOSITS = NONE
AQUATIC PLANTS = NONE
ALGAE OBSERVED = VISIBLE ONLY ON EDGES
WATER COLORED GREEN (Y/N) = N

****

REGIONAL MODELING SYSTEM Ver 3 2 (OWRM - 9/90)
06-04-1999 12 09 17

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TKN data from RFAAP

NPID	PLD	DTDMRDUE	DTDMRCVD	PRA	MQAV	MQMX	MCA	MCM	MEX
							TKN		
VA000024	007	10-Oct 94	11-Oct-94	068	14 99	14 99	1 1	1 1	0
VA000024	007	10-Nov 94	10-Nov-94	068	1 64	1 64	0 1	0 1	0
VA000024	007	10-Dec 94	12-Dec-94	068	2 706	2 706	0 2	0 2	0
VA000024	007	10-Jan 95	10-Jan-95	068	3 325	3 325	0 2	0 2	0
VA000024	007	10-Feb 95	10-Feb-95	068	5 235	5 235	0 3	0 3	0
VA000024	007	10-Mar 95	10-Mar-95	068	1 494	1 494	0 1	0 1	0
VA000024	007	10-Apr 95	10-Apr-95	068	49 13	49 13	3 2	3 2	0
VA000024	007	10-May 95	11-May-95	068	15 19	15 19	1	1	0
VA000024	007	10-Jun 95	12-Jun-95	068	28 13	28 13	2 1	2 1	0
VA000024	007	10-Jul 95	11-Jul-95	068	66 94	66 94	5 6	5 6	0
VA000024	007	10-Aug 95	11-Aug-95	068	15 29	15 29	1 7	1 7	0
VA000024	007	10-Sep 95	08-Sep-95	068	35 6	35 6	2 8	2 8	0
VA000024	007	10-Oct 95	10-Oct-95	068	20 46	20 46	2 2	2 2	0
VA000024	007	10-Nov 95	13-Nov-95	068	21 1	21 1	1 7	1 7	0
VA000024	007	10-Dec 95	11-Dec-95	068	26 73	26 73	1 7	1 7	0
VA000024	007	10-Jan 96	16-Jan-96	068	60 8	60 8	3 4	3 4	0
VA000024	007	10-Feb 96	12-Feb-96	068	21 74	21 74	1 1	1 1	0
VA000024	007	10-Mar 96	11-Mar 96	068	58 14	58 14	2 2	2 2	
VA000024	007	10-Apr 96	10-Apr-96	068	25 97	25 97	1	1	0
VA000024	007	10-May 96	10-May-96	068	164 4	164 4	6 7	6 7	0
VA000024	007	10-Jul 96	10-Jul-96	068	60 92	60 92	5	5	
VA000024	007	10-Aug 96	12-Aug-96	068	8 41	8 41	1	1	0
VA000024	007	10-Aug 96	26-Jul-96	068	13 04	13 04	1 1	1 1	0
VA000024	007	10-Sep 96	10-Sep-96	068	56 48	56 48	3 9	3 9	0
VA000024	007	10-Oct 96	10-Oct-96	068	12 42	12 42	1 7	1 7	0
VA000024	007	10-Nov 96	12-Nov-96	068	37 49	37 49	3 4	3 4	0
VA000024	007	10-Dec 96	10-Dec-96	068	28 74	28 74	2 2	2 2	0
VA000024	007	10-Jan 97	10-Jan-97	068	20 79	20 79	1 7	1 7	0
VA000024	007	10-Feb 97	10-Feb-97	068	10 34	10 34	1 1	1 1	0
VA000024	007	10-Mar 97	10-Mar-97	068	25 8	25 8	1 7	1 7	0
VA000024	007	10-Apr 97	10-Apr-97	068	16 31	16 31	1 1	1 1	0
VA000024	007	10-May 97	12-May-97	068	43 15	43 15	3 4	3 4	0
VA000024	007	10-Jun 97	10-Jun-97	068	30 73	30 73	2 8	2 8	0
VA000024	007	10-Jul 97	10-Jul-97	068	37 94	37 94	4 5	4 5	0
VA000024	007	10-Aug 97	11-Aug-97	068	34 97	34 97	3 9	3 9	0
VA000024	007	10-Sep 97	10-Sep-97	068	16 35	16 35	1 7	1 7	0
VA000024	007	10-Oct-97	10-Oct-97	068	25 16	25 16	1 7	1 7	0
VA000024	007	10-Nov 97	10-Nov-97	068	18 84	18 84	1 7	1 7	0
VA000024	007	10-Dec 97	11-Dec 97	068	26 59	26 59	1 7	1 7	0
VA000024	007	10-Jan 98	12-Jan-98	068	7 97	7 97	0 68	0 68	0
VA000024	007	10-Feb 98	10-Feb-98	068	5 15	5 15	0 37	0 37	
VA000024	007	10-Mar 98	10-Mar-98	068	27 13	27 13	1 8	1 8	
VA000024	007	10-Apr 98	10-Apr-98	068	1 46	1 46	0 11	0 11	
VA000024	007	10-May 98	11-May-98	068	7 83	7 83	0 51	0 51	
VA000024	007	10-Jun 98	10-Jun-98	068	1 09	1 09	0 1	0 1	
VA000024	007	10-Jul 98	08-Jul-98	068	8 51	8 51	0 86	0 86	

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112
51

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							TKN	
VA000024	007	10-Aug 98	04-Aug-98	068	3 93	3 95	0 45	0 45
VA000024	007	10-Sep 98	10-Sep-98	068	1 71	1 71	0 1	0 1
VA000024	007	10-Oct 98	13-Oct-98	068	3 05	3 05	0 2	0 2
VA000024	007	10-Nov 98	10-Nov-98	068	2 94	2 94	0 2	0 2
VA000024	007	10-Dec 98	10-Dec-98	068	2 88	2 88	0 2	0 2
VA000024	007	10-Jan 99	11-Jan-99	068	14 02	14 02	1 06	1 06

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page 2 of

	outfall						TKN		
VA000024	026	10-Oct 94	11-Oct-94	068	0 556	0 556	0 7	0 7	0
VA000024	026	10-Nov 94	10-Nov-94	068	13 28	13 28	16 8	16 8	0
VA000024	026	10-Dec 94	12-Dec-94	068	17 58	17 58	31	31	0
VA000024	026	10-Jan 95	10-Jan-95	068	4 813	4 813	5 6	5 6	0
VA000024	026	10-Feb 95	10-Feb-95	068	0 601	0 601	0 4	0 4	0
VA000024	026	10-Mar 95	10-Mar-95	068	5 331	5 331	4 7	4 7	0
VA000024	026	10-Apr 95	10-Apr-95	068	10 21	10 21	5 5	5 5	0
VA000024	026	10-May 95	11-May-95	068	8 758	8 758	7 8	7 8	0
VA000024	026	10-Jun 95	12-Jun-95	068	6 946	6 946	9	9	0
VA000024	026	10-Jul 95	11-Jul-95	068	4 346	4 346	6 2	6 2	0
VA000024	026	10-Aug 95	11-Aug-95	068	11 04	11 04	21	21	0
VA000024	026	10-Sep 95	08-Sep-95	068	13 01	13 01	16	16	0
VA000024	026	10-Oct 95	10-Oct-95	068	2 682	2 682	3 4	3 4	0
VA000024	026	10-Nov 95	13-Nov-95	068	12 52	12 52	6 2	6 2	0
VA000024	026	10-Dec 95	11-Dec-95	068	1 445	1 445	1 7	1 7	0
VA000024	026	10-Jan 96	16-Jan-96	068	5 28	5 28	5 6	5 6	0
VA000024	026	10-Feb 96	12-Feb-96	068	1 65	1 65	1 4	1 4	0
VA000024	026	10-Mar 96	11-Mar-96	068	1 92	1 928	1 7	1 7	
VA000024	026	10-Apr 96	10-Apr-96	068	4 6	5 79	6 55	8 5	0
VA000024	026	10-Jun 96	10-Jun-96	068	7 13	7 134	14	14	0
VA000024	026	10-Jul 96	10-Jul-96	068	8 84	8 84	7 3	7 3	0
VA000024	026	10-Sep 96	10-Sep-96	068	5 16	5 16	2 8	2 8	0
VA000024	026	10-Oct 96	10-Oct-96	068	1 15	1 15	1 7	1 7	0
VA000024	026	10-Nov 96	12-Nov-96	068	4 95	4 95	6 2	6 2	0
VA000024	026	10-Dec 96	10-Dec-96	068	8 32	8 32	9	9	0
VA000024	026	10-Jan 97	10-Jan-97	068	5 36	5 36	6 7	6 7	0
VA000024	026	10-Feb 97	10-Feb-97	068	1 14	1 14	1	1	0
VA000024	026	10-Mar 97	10-Mar-97	068	8 14	8 14	5 6	5 6	0
VA000024	026	10-Apr 97	10-Apr-97	068	5 19	5 19	4 5	4 5	0
VA000024	026	10-May 97	12-May-97	068	13 51	13 51	17	17	0
VA000024	026	10-Jun 97	10-Jun-97	068	1 37	1 37	2 2	2 2	0
VA000024	026	10-Jul 97	10-Jul-97	068	7 14	7 14	9	9	0
VA000024	026	10-Aug 97	11-Aug-97	068	2 53	2 53	4 5	4 5	0
VA000024	026	10-Sep 97	10-Sep-97	068	5 18	5 18	6 2	6 2	0
VA000024	026	10-Oct 97	10-Oct-97	068	3 73	3 73	4 5	4 5	0
VA000024	026	10-Nov 97	10-Nov-97	068	8 64	8 64	19	19	0
VA000024	026	10-Dec 97	11-Dec-97	068	7 95	7 95	17	17	0
VA000024	026	10-Jan 98	12-Jan-98	068	10 27	10 27	15	15	0
VA000024	026	10-Feb 98	10-Feb-98	068	7 34	7 34	8 4	8 4	
VA000024	026	10-Mar 98	10-Mar-98	068	13 46	13 46	12 2	12 2	
VA000024	026	10-Apr 98	10-Apr-98	068	8 19	8 19	12	12	
VA000024	026	10-May 98	11-May-98	068	18 6	18 6	24	24	
VA000024	026	10-Jun 98	10-Jun-98	068	1 68	1 68	2	2	
VA000024	026	10-Jul 98	08-Jul-98	068	4 93	4 93	6 5	6 5	
VA000024	026	10-Aug 98	04-Aug-98	068	2 49	2 49	3 4	3 4	
VA000024	026	10-Sep 98	10-Sep-98	068	3 33	3 33	4 6	4 6	
VA000024	026	10-Oct 98	13-Oct 98	068	7 3	7 3	8 12	8 12	
VA000024	026	10-Nov 98	10-Nov-98	068	4 19	4 19	4 7	4 7	
VA000024	026	10-Dec 98	10-Dec-98	068	4 11	4 11	4 76	4 76	
VA000024	026	10-Jan 99	11-Jan-99	068	4 44	4 44	6 03	6 03	

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	outfall						TKN		
VA000024	029	10-Oct-94	11-Oct-94	068	3 065	3 065	1 2	1 2	0
VA000024	029	10-Nov 94	10-Nov-94	068	5 796	5 796	1 6	1 6	0
VA000024	029	10-Dec 94	12-Dec-94	068	1 724	1 724	0 6	0 6	0
VA000024	029	10-Jan 95	10-Jan-95	068	9 485	9 485	2 2	2 2	0
VA000024	029	10-Feb 95	10-Feb-95	068	4 996	4 996	1 5	1 5	0
VA000024	029	10-Mar-95	10-Mar-95	068	4 666	4 666	2 8	2 8	0
VA000024	029	10-Apr 95	10-Apr-95	068	5 069	5 069	3 1	3 1	0
VA000024	029	10-May 95	11-May-95	068	2 372	2 372	1	1	0
VA000024	029	10-Jun 95	12-Jun-95	068	12 23	12 23	5 2	5 2	0
VA000024	029	10-Jul 95	11-Jul-95	068	17 55	17 55	8 5	8 5	0
VA000024	029	10-Aug 95	11-Aug-95	068	3 513	3 513	2 2	2 2	0
VA000024	029	10-Sep-95	08-Sep-95	068	7 42	7 42	1 7	1 7	0
VA000024	029	10-Oct-95	10-Oct-95	068	8 151	8 151	6 7	6 7	0
VA000024	029	10 Nov-95	13-Nov-95	068	5 426	5 426	1	1	0
VA000024	029	10-Dec 95	11-Dec-95	068	19 65	19 65	3 9	3 9	0
VA000024	029	10-Jan 96	16-Jan-96	068	12 53	12 53	3 9	3 9	0
VA000024	029	10-Feb 96	12-Feb-96	068	10 76	10 76	2 2	2 2	0
VA000024	029	10 Mar-96	11-Mar-96	068	5 72	5 72	1 1	1 1	
VA000024	029	10-Apr 96	10-Apr-96	068	10 68	10 68	2 5	2 5	0
VA000024	029	10-May-96	10-May-96	068	19 64	19 64	3 9	3 9	0
VA000024	029	10-Jun 96	10-Jun-96	068	8 79	8 79	2 2	2 2	0
VA000024	029	10-Jul 96	10-Jul-96	068	9 1	9 1	2 2	2 2	0
VA000024	029	10-Aug 96	12-Aug-96	068	2 46	2 46	1 1	1 1	0
VA000024	029	10-Sep-96	10-Sep-96	068	12 22	12 22	3 4	3 4	0
VA000024	029	10-Oct 96	10-Oct-96	068	10 86	10 86	3 4	3 4	0
VA000024	029	10-Nov-96	12-Nov-96	068	12 16	12 16	4 5	4 5	0
VA000024	029	10-Dec 96	10-Dec-96	068	4 35	4 35	1	1	0
VA000024	029	10-Jan 97	10-Jan-97	068	6 03	6 03	1 7	1 7	0
VA000024	029	10-Feb 97	10-Feb-97	068	20 76	41 04	5 13	9 77	0
VA000024	029	10-Mar 97	10-Mar-97	068	47 68	47 68	12	12	0
VA000024	029	10-Apr 97	10-Apr-97	068	14 53	14 53	3 4	3 4	0
VA000024	029	10-May 97	12-May-97	068	38 94	38 94	7 3	7 3	0
VA000024	029	10-Jun-97	10-Jun-97	068	4 55	4 55	1	1	0
VA000024	029	10-Jul 97	10-Jul-97	068	21 72	21 72	3 9	3 9	0
VA000024	029	10-Aug-97	11-Aug-97	068	3 23	3 23	1 1	1 1	0
VA000024	029	10-Sep 97	10-Sep-97	068	21 46	21 46	6 8	6 8	0
VA000024	029	10-Oct 97	10-Oct-97	068	7 38	7 38	2 2	2 2	0
VA000024	029	10-Nov 97	10-Nov-97	068	10 16	10 16	2 2	2 2	0
VA000024	029	10-Dec 97	11-Dec-97	068	12 44	12 44	3 7	3 7	0
VA000024	029	10-Jan 98	12-Jan-98	068	6 06	6 06	1 6	1 6	0
VA000024	029	10-Feb 98	10-Feb-98	068	15 95	15 95	4 7	4 7	
VA000024	029	10-Mar 98	10-Mar-98	068	26 63	26 63	3 2	3 2	
VA000024	029	10-Apr 98	10-Apr-98	068	0 36	0 36	0 11	0 11	
VA000024	029	10-May 98	11-May-98	068	1 38	1 38	0 45	0 45	
VA000024	029	10-Jun 98	10-Jun-98	068	1 74	1 74	0 58	0 58	
VA000024	029	10-Jul 98	08-Jul-98	068	28 95	28 95	10	10	
VA000024	029	10-Aug 98	04-Aug-98	068	4 37	4 37	2 5	2 5	
VA000024	029	10-Sep 98	10-Sep-98	068	9 59	9 59	3 6	3 6	
VA000024	029	10-Oct 98	13-Oct-98	068	6 13	6 13	2 16	2 16	
VA000024	029	10-Nov 98	10-Nov-98	068	0 54	0 54	0 25	0 25	

	outfall						TKN		
VA000024	029	10-Dec 98	10-Dec-98	068	5 76	5 76	1 87	1 87	
VA000024	029	10-Jan-99	11 Jan-99	068	6 49	6 49	2 22	2 22	

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APPENDIX F

WHOLE EFFLUENT TOXICITY PROGRAM

2014

Memorandum - WET Testing Data Summary 2010-2013

WETLIM10 Spreadsheets & STATS Determinations
9.0 MGD
18.0 MGD

2009

TMP data summary 2005-2008

WETLIM10 spreadsheet (6/8/09)

STATS determinations
Pimephales promelas (fathead minnows)
Ceriodaphnia dubia (water fleas)

2004

from Attachment E of 2004 fact sheet

TMP data summary 1994-2003

WETLIM10 spreadsheet (8/16/04)

MEMORANDUM
VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY
WATER DIVISION
Blue Ridge Regional Office

Subject:	VPDES Permit VA0062685 Reissuance; Pepper's Ferry Regional Wastewater Treatment Authority; Whole Effluent Toxicity Program
To:	Permit File
From:	Bob Tate, Water Permit Writer
Date:	February 26, 2014

INTRODUCTION:

The Pepper's Ferry Regional Wastewater Treatment Authority owns and operates the Pepper's Ferry WWTP which serves the City of Radford, the Town of Dublin, the Town of Pulaski and parts of Pulaski County and Montgomery County. Whole effluent toxicity (WET) testing reports were submitted annually as required in Part I.E of the permit that became effective October 22, 2009. The two tables below summarize testing data for 2010 through 2013.

Ceriodaphnia dubia (water fleas)

Year	Reproduction NOEC	Survival NOEC	% Survival in 100% effluent
2010	100% → 1.0 TUc	100% → 1.0 TUc	90
2011	100% → 1.0 TUc	100% → 1.0 TUc	100
2012	100% → 1.0 TUc	100% → 1.0 TUc	90
2013	100% → 1.0 TUc	100% → 1.0 TUc	100

LC50 values and IC25 values for all tests (both species) = >100

Pimephales promelas (fathead minnows)

Year	Growth NOEC	Survival NOEC	% Survival in 100% effluent
2010	100% → 1.0 TUc	100% → 1.0 TUc	97.5
2011	100% → 1.0 TUc	100% → 1.0 TUc	92.5
2012	100% → 1.0 TUc	100% → 1.0 TUc	95
2013	100% → 1.0 TUc	100% → 1.0 TUc	92.5

testing laboratory: R.E.I. Consultants, Inc.

Spreadsheet for determination of WET test endpoints or WET limits

	Excel 97			**Acute Endpoint/Permit Limit**			**Use as LC_{50} in Special Condition, as TUa on DMR**					
	Revision Date: 12/13/13											
	File: WETLIM10.xls			ACUTE	100% =	NOAEC	LC_{50} =	NA	% Use as	NA	TUa	
	(MIX.EXE required also)											
				ACUTE WLAa		0.68804	Note: Inform the permittee that if the mean of the data exceeds					
							this TUa:	1.0	a limit may result using STATS.EXE			
				Chronic Endpoint/Permit Limit			**Use as NOEC in Special Condition, as TUc on DMR**					
				CHRONIC	6.88040017	TU_c	NOEC =	15	% Use as	6.66	TU_c	
				BOTH*	6.88040017	TU_c	NOEC =	15	% Use as	6.66	TU_c	
Enter data in the cells with blue type:				AML	6.88040017	TU_c	NOEC =	15	% Use as	6.66	TU_c	
Entry Date:		02/27/14		ACUTE WLAa,c		6.8804		Note: Inform the permittee that if the mean				
Facility Name:		Pepper's Ferry Regional W		CHRONIC WLAc		61.6666667		of the data exceeds this TUc:			2.82746378	
VPDES Number:		**VA0062685**		* Both means acute expressed as chronic				a limit may result using STATS.EXE				
Outfall Number:		1										
				% Flow to be used from MIX.EXE				**Diffuser /modeling study?**				
Plant Flow:		9	MGD					Enter Y/N	n			
Acute 1Q10:		436	MGD	2.67	%			Acute	1	:1		
Chronic 7Q10:		546	MGD	100	%			Chronic	1	:1		
Are data available to calculate CV? (Y/N)				N	(Minimum of 10 data points, same species, needed)					Go to Page 2		
Are data available to calculate ACR? (Y/N)				N	(NOEC<LC50, do not use greater/less than data)					Go to Page 3		
IWC_a		43.60211616	%	Plant flow/plant flow + 1Q10			**NOTE: If the IWCa is >33%, specify the**					
IWC_c		1.621621622	%	Plant flow/plant flow + 7Q10			**NOAEC = 100% test/endpoint for use**					
Dilution, acute		2.293466667		100/IWCa								
Dilution, chronic		61.66666667		100/IWCc								
WLA_a		0.68804	Instream criterion (0.3 TUa) X's Dilution, acute									
WLA_c		61.66666667	Instream criterion (1.0 TUc) X's Dilution, chronic									
$WLA_{a,c}$		6.8804	ACR X's WLA_a - converts acute WLA to chronic units									
ACR -acute/chronic ratio		10	LC50/NOEC (Default is 10 - if data are available, use tables Page 3)									
CV-Coefficient of variatior		0.6	Default of 0.6 - if data are available, use tables Page 2)									
Constants	eA	0.4109447	Default = 0.41									
	eB	0.6010373	Default = 0.60									
	eC	2.4334175	Default = 2.43									
	eD	2.4334175	Default = 2.43 (1 samp)	No. of sample		1	**The Maximum Daily Limit is calculated from the lowest					
$LTA_{a,c}$		2.827463914	WLAa,c X's eA				LTA, X's eC. The LTAa,c and MDL using it are driven by the ACR.					
LTA_c		37.06396683	WLAc X's eB							Rounded NOEC's		%
MDL** with $LTA_{a,c}$		6.880400169	TU_c	NOEC =	14.534038	(Protects from acute/chronic toxicity)				NOEC =	15	%
MDL** with LTA_c		90.19210551	TU_c	NOEC =	1.108744	(Protects from chronic toxicity)				NOEC =	2	%
AML with lowest LTA		6.880400169	TU_c	NOEC =	14.534038	Lowest LTA X's eD				NOEC =	15	
IF ONLY ACUTE ENDPOINT/LIMIT IS NEEDED, CONVERT MDL FROM TU_c to TU_a												
										Rounded LC50's		%
MDL with $LTA_{a,c}$		0.688040017	TU_a	LC50 =	145.340384	%	Use NOAEC=100%			LC50 =	NA	%
MDL with LTA_c		9.019210551	TU_a	LC50 =	11.087445	%				LC50 =	12	

2/28/2014 1:06:04 PM

Facility = PFRWTA
Chemical = Whole Effluent Toxicity in TU
Chronic averaging period = 4
WLAa = 6.8804
WLAc = 61.6667
Q.L. = 1.0
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 4
Expected Value = 1
Variance = .36
C.V. = 0.6
97th percentile daily values = 2.43341
97th percentile 4 day average = 1.66379
97th percentile 30 day average= 1.20605
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

No Limit is required for this material

The data are:

1
1
1
1

Spreadsheet for determination of WET test endpoints or WET limits

Excel 97
Revision Date: 12/13/13
File: WETLIM10.xls
(MIX.EXE required also)

Enter data in the cells with blue type:

Entry Date:	02/27/14	
Facility Name:	Pepper's Ferry Regional W	
VPDES Number:	VA0062685	
Outfall Number:	1	
Plant Flow:	18	MGD
Acute 1Q10:	436	MGD
Chronic 7Q10:	546	MGD

Acute Endpoint/Permit Limit — **Use as LC_{50} in Special Condition, as TUa on DMR**

ACUTE	100% =	NOAEC	LC_{50} =	NA	% Use as	NA	TUa
ACUTE WLAa		0.49765333	Note: Inform the permittee that if the mean of the data exceeds this TUa:	1.0	a limit may result using STATS.EXE		

Chronic Endpoint/Permit Limit — **Use as NOEC in Special Condition, as TUc on DMR**

CHRONIC	4.97653346	TU_c	NOEC =	21	% Use as	4.76	TU_c
BOTH*	4.97653346	TU_c	NOEC =	21	% Use as	4.76	TU_c
AML	4.97653346	TU_c	NOEC =	21	% Use as	4.76	TU_c

ACUTE WLAa,c	4.97653333	
CHRONIC WLAc	31.3333333	

Note: Inform the permittee that if the mean of the data exceeds this TUc: 2.0450799 a limit may result using STATS.EXE

* Both means acute expressed as chronic

% Flow to be used from MIX.EXE

Acute	2.72	%
Chronic	100	%

Diffuser /modeling study?

Enter Y/N	n	
Acute	1	:1
Chronic	1	:1

Are data available to calculate CV? (Y/N)	N	(Minimum of 10 data points, same species, needed)	Go to Page 2
Are data available to calculate ACR? (Y/N)	N	(NOEC<LC50, do not use greater/less than data)	Go to Page 3

IWC_a	60.28292787	%	Plant flow/plant flow + 1Q10
IWC_c	3.191489362	%	Plant flow/plant flow + 7Q10

NOTE: If the IWCa is >33%, specify the NOAEC = 100% test/endpoint for use

Dilution, acute	1.658844444	100/IWCa
Dilution, chronic	31.33333333	100/IWCc

WLA_a	0.497653333	Instream criterion (0.3 TUa) X's Dilution, acute
WLA_c	31.33333333	Instream criterion (1.0 TUc) X's Dilution, chronic
$WLA_{a,c}$	4.976533333	ACR X's WLA_a - converts acute WLA to chronic units

ACR -acute/chronic ratio		10	LC50/NOEC (Default is 10 - if data are available, use tables Page 3)
CV-Coefficient of variatior		0.6	Default of 0.6 - if data are available, use tables Page 2)
Constants	eA	0.4109447	Default = 0.41
	eB	0.6010373	Default = 0.60
	eC	2.4334175	Default = 2.43
	eD	2.4334175	Default = 2.43 (1 samp)

No. of sample 1

**The Maximum Daily Limit is calculated from the lowest LTA, X's eC. The LTAa.c and MDL using it are driven by the ACR.

$LTA_{a,c}$	2.045079998	WLAa,c X's eA						
LTA_c	18.83250207	WLAc X's eB					Rounded NOEC's	%
MDL** with $LTA_{a,c}$	4.976533455	TU_c	NOEC =	20.094309	(Protects from acute/chronic toxicity)		NOEC = 21	%
MDL** with LTA_c	45.8273401	TU_c	NOEC =	2.182104	(Protects from chronic toxicity)		NOEC = 3	%
AML with lowest LTA	4.976533455	TU_c	NOEC =	20.094309	Lowest LTA X's eD		NOEC = 21	

IF ONLY ACUTE ENDPOINT/LIMIT IS NEEDED, CONVERT MDL FROM TU_c to TU_a

							Rounded LC50's	%
MDL with $LTA_{a,c}$	0.497653346	TU_a	LC50 =	200.943088	%	Use NOAEC=100%	LC50 = NA	%
MDL with LTA_c	4.58273401	TU_a	LC50 =	21.821035	%		LC50 = 22	

2/28/2014 1:04:20 PM

Facility = PFRWTA - 18 MGD
Chemical = Whole Effluent Toxicity in TU
Chronic averaging period = 4
WLAa = 4.9765
WLAc = 31.3333
Q.L. = 1.0
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 4
Expected Value = 1
Variance = .36
C.V. = 0.6
97th percentile daily values = 2.43341
97th percentile 4 day average = 1.66379
97th percentile 30 day average= 1.20605
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

No Limit is required for this material

The data are:

1
1
1
1

Peppers Ferry Regional Wastewater Treatment Authority
VPDES VA0062685
TMP Data Summary
Outfall 001

***chronic 7 day static renewal survival and growth test using Pimephales promelas* (fathead minnows)**

Date	Growth NOEC	IC25	Survival NOEC	LC50 at 48 hours	Survival in 100% effluent
Oct 05	100% → 1 0 TUc	>100%	100% → 1 0 TUc	>100%	98%
Dec 05					
Oct 06	100% → 1 0 TUc	>100%	100% → 1 0 TUc	>100%	100%
Oct 07	100% → 1 0 TUc	>100%	100% → 1 0 TUc	>100%	97 5%
Oct 08	100% → 1 0 TUc	>100%	100% → 1 0 TUc	>100%	100%

***chronic 3 brood static renewal survival and reporduction test using Ceriodaphnia dubia* (water fleas)**

Date	Reproduction NOEC	IC25	Survival NOEC	LC50 at 48 hours	Survival in 100% effluent
Oct 05					
Dec 05	27% → 3 7 TUc	54 5%	100% → 1 0 TUc	>100%	100%
Oct 06	100% → 1 0 TUc	>100%	100% → 1 0 TUc	>100%	100%
Oct 07	38% → 2 6 TUc	26 6%	100% → 1 0 TUc	>100%	90%
Oct 08	100% → 1 0 TUc	95 4%	100% → 1 0 TUc	>100%	100%

Spreadsheet for determination of WET test endpoints or WET limits

	E cel 97			Acute Endpoint/Permit Limit			Use as LC in Special Co ditio as TUa o DMR						
	Re ision Date 01/10/05												
	File WETLIM10 xls			ACUTE	100 /	NOAEC	LC_{50}	NA	/ Use as	NA	TU		
	(MIX.EXE req ired i)												
				ACUTE WLAa		0 75053333	Note I fo m the pe m ttee that if the mean of the data e ceeds						
							th TU	1 0	a lim t may result us ng WLA EXE				
				Chronic Endpoint/Permit Limit			Use as NOEC in Special Condition as TUc on DMR						
				CHRONIC	7 505333517	TU	NOEC	14	Use as	7 14	TU		
				BOTH	7 505333517	TU	NOEC	14	/ Use as	7 14	TU		
	Enter data in the cells with blue type			AML	7 505333517	TU	NOEC	14	Use as	7 14	TU		
	Entry Date	06/08/09		ACUTE WLAa c		7 50533333		Note Inform the pe m ttee that if the mean					
	Fac l ty Name	Peppe s Fe ry RWTA		CHRONIC WLAc		61 6666667		of the data e ceeds this TUc			3 08427681		
	VPDES Number	VA0062585		Both mea ut xp essed as hro ic				a l m t may result using WLA EXE					
/	Outfall Number	1			/ Flow to be used from MIX EXE			Difuse /modeling study?					
	Pla t Flow	9	MGD					Enter Y/N	N				
	Acute 1Q10	436	MGD	3 1	/			Acute	1	1			
	Chronic 7Q10	546	MGD	100	/			Ch o c	1	1			
	Are data available to calculate CV? (Y/N)			N	(M n mum of 10 data points same spec es needed)					Go to Page 2			
	Are data a a lable to calculate ACR? (Y/N)			N	(NOEC LC50 do not use g eate /less than data)					Go to Page 3			
	IWC	39 97157577	/	Pla t flow/plant flow 1Q10			NOTE If the IWCa is 33 / specify the						
	IWC	1 621621622	/	Plant flow/plant flow 7Q10			NOAEC 100 / test/endpol t fo se						
	Dilut on acute	2 501777778		100/IWCa									
	Dilut on chron c	61 66666667		100/IWCc									
	WLA_a	0 750533333	Instream c te o (0 3 TUa) X's D I tion acute										
	WLA_c	61 66666667	I st eam c te on (1 0 TUc) X s Dil t on ch o c										
	WLA_a	7 505333333	ACR X s WLA_a co erts ac te WLA to ch on c nits										
	ACR acute/ch o ic at o	10	LC50/NOEC (Default s 10 if data a e a a lable use tables Page 3)										
	CV Coeff c ent of anal or	0 6	Defa lt of 0 6 if data a e a a lable use tables Page 2)										
	Constants eA	0 4109447	Default 0 41										
	eB	0 6010373	Default 0 60										
	eC	2 4334175	Default 2 43										
	eD	2 4334175	Defa lt 2 43 (1 samp)	No of sample t			**Th Ma m m D ly Limit i l ist d fr m th lowe l						
							LTA X C Th LTAs d MDL g lt re d ive by th ACR						
	LTA_a	3 084276955	WLAa c X's eA										
	LTA_c	37 06396883	WLAc X's eB							Rou ded NOEC s		/	
	MDL with LTA_a	7 505333517	TU	NOEC	13 323858	(P otects from acute/ch o c to c ty)				NOEC	14	/	
	MDL with LTA_c	90 19210551	TU	NOEC	1 108744	(Protects f om ch o c to city)				NOEC	2	/	
	AML with lowest LTA	7 505333517	TU	NOEC	13 323858	Lowest LTA X's eD				NOEC	14		
	IF ONLY ACUTE ENDPOINT/LIMIT IS NEEDED CONVERT MDL FROM TU to TU												
										Rou ded LC50 s		/	
	MDL with LTA_a	0 750533352	TU	LC50	133 238583	/	Use NOAEC 100 /			LC50	NA	/	
	MDL with LTA_c	9 019210551	TU	LC50	11 087445	/				LC50	12		

Page 2 Follow the directions to develop a site specific CV (coefficient of variation)

IF YOU HAVE AT LEAST 10 DATA POINTS THAT ARE QUANTIFIABLE (NOT OR) FOR A SPECIES ENTER THE DATA IN EITHER COLUMN G (VERTEBRATE) OR COLUMN J (INVERTEBRATE) THE CV WILL BE PICKED UP FOR THE CALCULATIONS BELOW THE DEFAULT VALUES FOR eA eB AND eC WILL CHANGE IF THE CV IS ANYTHING OTHER THAN 0 6

Coefficient of Variat on for effl ent tests

CV 0 6 (Defa lt 0 6)

δ 0 3074847

δ 0 554513029

Us ng the log ar ance to de elop eA

(P 100 step 2a of TSD)

Z 1 881 (97 / probab l ty stat from table

A -0 88929666

eA 0 410944686

Us g the log ar ance to de elop eB

(P 100 step 2b of TSD)

δ 0 086177696

δ 0 293560379

B -0 50909823

eB 0 601037335

Using the log vana ce to develop eC

(P 100 step 4a of TSD)

δ 0 3074847

δ 0 554513029

C 0 889296658

eC 2 43341752

Us ng the log a ance to de elop eD

(P 100 step 4b of TSD)

1 This numbe will most l kely stay as 1 fo 1 sample/mo th

δ 0 3074847

δ 0 554513029

D 0 889296658

eD 2 433417525

	Vertebrate IC Data or LC_{50} Data	LN of data		In ertebrate IC Data or LC_{50} Data	LN of data
	**				
1	0		1	0	
2			2		
3			3		
4			4		
5			5		
6			6		
7			7		
8			8		
9			9		
10			10		
11			11		
12			12		
13			13		
14			14		
15			15		
16			16		
17			17		
18			18		
19			19		
20			20		
St De	NEED DATA	NEED DATA	St De	NEED DATA	NEED DATA
Mean	0	0	Mean	0	0
Vanance	0	0 000000	Var a ce	0	0 000000
CV	0		CV	0	

Page 3 Follow directions to develop a site specific ACR (Acute to Chronic Ratio)

To determ e Acute/Ch o c Ratio (ACR) sert usable data below Usable data s defined as al d pa ed test esults acute a d ch o c tested at the same tempe atu e same spec es The ch o c NOEC must be less than the acute LC_{50} since the ACR d des the LC_{50} by the NOEC LC_{50} s 100 / should not be used

Table 1 ACR usi g Verteb ate data

Set #	LC_{50}	NOEC	Test ACR	Loga ithm	Geomean	Antilog	ACR to Use
1	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
2	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
3	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
4	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
5	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
6	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
7	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
8	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
9	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
10	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
				ACR fo erteb ate data			0

Table 1 Result	Verteb ate ACR 0
Table 2 Result	In erteb ate ACR 0
	Lowest ACR Defa lt to 10

Table 2 ACR sing In ertebrate data

Set #	LC_{50}	NOEC	Test ACR	Logarithm	Geomean	Antilog	ACR to Use
1	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
2	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
3	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
4	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
5	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
6	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
7	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
8	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
9	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
10	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
				ACR fo ertebrate data			0

Table 3 Convert LC_{50} s and NOEC s to Chronic TU s

fo use I WLA.EXE
ACR used 10

	Enter LC_{50}	TUc	Ente NOEC	TUc
1		NO DATA		NO DATA
2		NO DATA		NO DATA
3		NO DATA		NO DATA
4		NO DATA		NO DATA
5		NO DATA		NO DATA
6		NO DATA		NO DATA
7		NO DATA		NO DATA
8		NO DATA		NO DATA
9		NO DATA		NO DATA
10		NO DATA		NO DATA
11		NO DATA		NO DATA
12		NO DATA		NO DATA
13		NO DATA		NO DATA
14		NO DATA		NO DATA
15		NO DATA		NO DATA
16		NO DATA		NO DATA
17		NO DATA		NO DATA
18		NO DATA		NO DATA
19		NO DATA		NO DATA
20		NO DATA		NO DATA

If WLA EXE determ nes that an acute l m t s needed yo need to convert the TUc a swer you get to TUa and then an LC50

ente it he e		NO DATA	/ LC_{50}
		NO DATA	TUa

DILUTION SERIES TO RECOMMEND

Table 4	Monitoring / Effluent	TUc	Limit / Effluent	TUc
Dilution series based on data mean	32 4	3 0842768		
Dilution series to use for limit			14	7 1428571
Dilution factor to recommend	0 3694077		0 3741657	
Dilution series to recommend	100 0	1 00	100 0	1 00
	56 9	1 76	37 4	2 67
	32 4	3 08	14 0	7 14
	18 5	5 42	5 2	19 09
	10 51	9 51	2 0	51 02
Extra dilutions if needed	5 99	16 71	0 7	136 36
	3 41	29 34	0 3	364 43

C ll 19
C mme t
This is ss ml g that th d t Typ 2 d t (f th d t th d t set ce so ed <")

C ll K18
C mment This ssuming th t th det Type 2 d ta (f th d ta th det set censo ed <")

C ll J22
C mme t R m mbe to h ng th N to "Y" if yo h ve sto nt ed th rwise th y wo 't be used in th cal latio

C ll C40
C mme t
If yo h ve nt ed d ta to calcul t ACR pag 3 nd th ia still d f lted to 10" m k su yo h ve selected "Y" in cell E21

C ll C41
C mme t If yo h vo t ed d ta t cal l t ffl nt pecific CV pag 2 d this still d f lted to 0 6 m k su yo h ve selected Y" in ll E20

C ll L48
Comment
See R w 151 fo th ppropriat d'luto senes t se fo these NOEC

C ll G62
C mment
V rt b tes
P m ph tes prom l
O corhynch mykss
Cypnnod variegat

C ll J62
C mme t
I vert b tes
C nod ph ia d bla
Mysid ps b hla

C ll C117
Comment V rt b ates

P m ph tes prom l
Cypri od variegatu

C ll M119
C mme t Th ACR h b p kod p f m cell C34 P g 1 If yo h ve p ed d ta t calculat ACR t it th tables to th l ft d m k yo h ve "Y" cell E21 Pag 1 Oth rwise th d f lt f 10 will be sed t co vert yo ut d ta

C ll M121
C mme t If yo ly co cerned with cut d t yo ca t it th NOEC col m f co ve lo d th mb cal lated will b q l t to th TU Th cal latio is th sam 100/NOEC TU 100/LC50 TU

C ll C138
C mme t I vert b st

C nod ph ia d bla
Mysid ps b hl

6/8/2009 8 32 00 AM

Facility = Pepper s Ferry RWTA
Chemical = WET - chronic test data for fathead minnows
Chronic averaging period = 4
WLAa = 7 5
WLAc = 61 7
Q L = 1
samples/mo = 1
samples/wk = 1

Summary of Statistics

observations = 4
Expected Value = 1
Variance = 36
C V = 0 6
97th percentile daily values = 2 43341
97th percentile 4 day average = 1 66379
97th percentile 30 day average= 1 20605
< Q L = 0
Model used = BPJ Assumptions type 2 data

No Limit is required for this material

The data are

1
1
1
1

6/8/2009 8 33 21 AM

Facility = Pepper s Ferry RWTA
Chemical = WET - chronic test data for water fleas
Chronic averaging period = 4
WLAa = 7 5
WLAc = 61 7
Q L = 1
samples/mo = 1
samples/wk = 1

Summary of Statistics

observations = 4
Expected Value = 2 075
Variance = 1 55002
C V = 0 6
97th percentile daily values = 5 04934
97th percentile 4 day average = 3 45236
97th percentile 30 day average= 2 50256
< Q L = 0
Model used = BPJ Assumptions type 2 data

No Limit is required for this material

The data are

3 7
1
2 6
1

Peppers Ferry RWTA
VA0062685
Outfall 001
TMP Data Summary

	Vertibrate		Invertebrate	
Date	NOEC %	Survival in 100%	LC50 %	Survival in 100%
11/29/1994	100	95	>100	100
10/10/1995	100	90	>100	100
10/14/1996	12 5	90	>100	95
11/11/1997	100	95	>100	100
10/20/1998	100	98	>100	100
10/19/1999	100	83	>100	100
10/24/2000	100	98	>100	100
10/15/2001	100	98	>100	100
10/23/2002	100	100	>100	100
10/29/2003	100	85	>100	90

Current monitoring requirements
48 hour static acute with *c dubia* for LC50 (invertebrate)
7 day static renewal with *p promelas* for NOEC survival and growth (vertebrate)

Spreadsheet for determination of WET test endpoints or WET limits

	Excel 97			Acute Endpoint/Permit Limit			Use as LC_{50} in Spec al Co dit o as TUa o DMR							
	Rev s on Date 06/07/04													
	F le WETLIM10 xls			ACUTE	100 /	NOAEC	LC_{50}	NA	Use as	NA	TU			
	(MIX EXE req d l)													
				ACUTE WLAa		0 745	Note Inform the permittee that if the mean of the data exceeds							
							th TU	1 0	a l m t may res lt us g WLA EXE					
				Chron c Endpo nt/Perm t L m t			Use as NOEC in Spec al Condition as TUc on DMR							
				CHRONIC	7 450000183	TU	NOEC	14	U e as	7 14	TU			
				BOTH	7 450000183	TU	NOEC	14	Use as	7 14	TU			
	Ente data the c lls with bl e type			AML	7 450000183	TU	NOEC	14	% Use as	7 14	TU			
	Entry Date	08/16/04		ACUTE WLAa c		7 45		Note Inform the perm ttee that f the mean						
	Fac l ty Name	Peppers Ferry RWTA		CHRONIC WLAc		64 4444444		of the data e ceeds th s TUc			3 06153787			
	VPDES N mbe	\A062685		B l t p ed h				a limit may result using WLA EXE						
	O tfall Number	1												
				/ Flow to be used from MIX EXE				D fuser /model ng study?						
	Plant Flow	9	MGD					Enter Y/N	N					
	Acute 1Q10	445	MGD	3	/			Acute	1	1				
	Chronic 7Q10	571	MGD	100	/			Chron c	1	1				
	Are data a ailable to calculate CV? (Y/N)			N	(Min mum of 10 data points same species needed)					Go to Page 2				
	Are data a a lable to calc late ACR? (Y/N)			N	(NOEC LC50 do not se g eater/less than data)					Go to Page 3				
	IWC	40 2684564	/	Plant flow/plant flow 1Q10			NOTE If the IWC s 33 / spec fy th							
	IWC	1 55172414	%	Plant flow/pla t flow 7Q10			NOAEC 100 / test/e dpo t for se							
	D lut on ac te	2 48333333		100/IWCa										
	D lution ch on c	64 4444444		100/IWCc										
	WLA	0 745		Instream criterion (0 3 TUa) X s D lut on acute										
	WLA	64 4444444		Instre n c te no (1 0 TUc) X s D l t on chro c										
	WLA	7 45		ACR X s WLA con rts to WLA to chro its										
	ACR ac te ch o c ratio	10		LC50/NOEC (Default is 10 if data are a a lable use tables Page 3)										
	CV Coeff c ent of a ato	0 6		Default of 0 6 f data are a a lable use tables Page 2)										
	Constants eA	0 410944		Default 0 41										
	eB	0 6010373		Defa lt 0 60										
	C	2 43341 5		D fa lt 2 43										
	eD	2 433 1 5		Defa lt 2 43 (1 samp)			**Th M im m D ly L m t l l t d f m th l w t							
							LTA X C Th LTAa d MDL g t re d by th ACR							
	LTA	3 06153802		WLAa c X's eA										
	LTA_c	38 7335149		WLAc X's eB										
	MDL with LTA	7 45000018	TU	NOEC	13 422818	(Protects from acute/chronic toxicity)				Rounded NOEC		/		
	MDL with LTA_c	94 2 4813	TU	NOEC	1 060954	(Protects from chronic to icity)				NOEC	14	/		
	AML with lowest LTA	7 45000018	TU	NOEC	13 422818	Lowest LTA X s eD				NOEC	2	/		
										NOEC	14			
	IF ONLY ACUTE ENDPOINT/LIMIT IS NEEDED CONVERT MDL FROM TU to TU													
	MDL with LTA	0 74500002	TU	LC50	134 228185	%	Use NOAEC 100			Ro ded LC 0 s		/		
	MDL with LTA_c	9 4254813	TU	LC50	10 609 38	/				LC50	NA	/		
										LC50	11			

Page 2 Follow the directions to develop a site specific CV (coefficient of variation)

IF YOU HAVE AT LEAST 10 DATA POINTS THAT ARE QUANTIFIABLE (NOT OR) FOR A SPECIES ENTER THE DATA IN EITHER COLUMN G (VERTEBRATE) OR COLUMN J (INVERTEBRATE) THE CV WILL BE PICKED UP FOR THE CALCULATIONS BELOW THE DEFAULT VALUES FOR eA eB AND eC WILL CHANGE IF THE CV IS ANYTHING OTHER THAN 0 6

Coefficient of Variation for efficient tests

CV 0 6 (Default 0 6)

δ 0 3074847

δ 0 55451303

Using the log variance to develop eA

(P 100 step 2a of TSD)

Z 1 881 (97% probability stat from table

A -0 8892967

eA 0 41094469

Using the log variance to develop eB

(P 100 step 2b of TSD)

δ 0 0861777

δ 0 29356038

B -0 5090982

eB 0 60103733

Using the log variance to develop eC

(P 100 step 4a of TSD)

δ 0 3074847

δ 0 55451303

C 0 88929666

eC 2 433417 3

Using the log variance to develop eD

(P 100 step 4b of TSD)

n 1 This number will most likely stay as 1 for 1 sample/month

δ 0 3074847

δ 0 55451303

D 0 88929666

eD 2 43341753

	Vertebrate		Invertebrate	
	IC_2 Data or LC_{50} Data	LN of data	IC Data or LC_{50} Data	LN of data
1	0		1	0
2			2	
3			3	
4			4	
5			5	
6			6	
7			7	
8			8	
9			9	
10			10	
11			11	
12			12	
13			13	
14			14	
15			15	
16			16	
17			17	
18			18	
19			19	
20			20	

St De	NEED DATA	NEED DATA	St Dev	NEED DATA	NEED DATA
Mean	0	0	Mean	0	0
Variance	0	0 000000	Variance	0	0 000000
CV	0		CV	0	

Page 3 Follow directions to develop a site specific ACR (Acute to Chronic Ratio)

To determine Acute/Chronic Rat o (ACR) nsert sable data below Usable data s defi ed as alid pa red test results acute and ch on c tested at the same temperatu e same spec es The chron c NOEC m st be less than the acute LC_{50} s nce the ACR d v des the LC_{50} by the NOEC LC_{50} s 100 / should not be used

T ble 1 ACR sing Vertebrate data

S t #	LC_{50}	NOEC	Test ACR	Log thm	Geome	A t log	ACR to Use
1	#N/A	#N A	#N/A	#N/A	#N/A	#N/A	NO DATA
2	#N/A	#N A	#N/A	#N/A	#N/A	#N/A	NO DATA
3	#N A	#N A	#N/A	#N/A	#N/A	#N/A	NO DATA
4	#N/A	#N A	#N/A	#N/A	#N/A	#N/A	NO DATA
5	#N A	#N A	#N/A	#N/A	#N/A	#N/A	NO DATA
6	#N A	#N A	#N/A	#N/A	#N/A	#N/A	NO DATA
7	#N A	#N A	#N/A	#N/A	#N/A	#N/A	NO DATA
8	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
9	#N A	#N A	#N/A	#N/A	#N/A	#N/A	NO DATA
10	#N A	#N A	#N/A	#N/A	#N/A	#N/A	NO DATA

ACR for ertebrate data 0

Table 1 Res lt — Vertebrate ACR 0

Table 2 Res lt — In ertebrate ACR 0

Lowest ACR Default to 10

T ble 2 ACR us ng I ert brate d ta

Set #	LC_{50}	NOEC	Test ACR	Logar thm	Geome	Ant log	ACR to Use
1	#N/A	#N A	#N/A	#N/A	#N/A	#N/A	NO DATA
2	#N/A	#N A	#N/A	#N/A	#N/A	#N/A	NO DATA
3	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
4	#N A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
5	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
6	#N/A	#N A	#N/A	#N/A	#N/A	#N/A	NO DATA
7	#N/A	#N A	#N/A	#N/A	#N/A	#N/A	NO DATA
8	#N/A	#N A	#N/A	#N/A	#N/A	#N/A	NO DATA
9	#N A	#N A	#N/A	#N/A	#N/A	#N/A	NO DATA
10	#N A	#N A	#N/A	#N/A	#N/A	#N/A	NO DATA

ACR fo ertebrate data 0

Convert LC_{50} s and NOEC s to Chronic TU s

Table 3

for use n WLA.EXE — ACR used 10

	Ente LC_{50}	TUc	Enter NOEC	TUc
1		NO DATA		NO DATA
2		NO DATA		NO DATA
3		NO DATA		NO DATA
4		NO DATA		NO DATA
5		NO DATA		NO DATA
6		NO DATA		NO DATA
7		NO DATA		NO DATA
8		NO DATA		NO DATA
9		NO DATA		NO DATA
10		NO DATA		NO DATA
11		NO DATA		NO DATA
12		NO DATA		NO DATA
13		NO DATA		NO DATA
14		NO DATA		NO DATA
15		NO DATA		NO DATA
16		NO DATA		NO DATA
17		NO DATA		NO DATA
18		NO DATA		NO DATA
19		NO DATA		NO DATA
20		NO DATA		NO DATA

If WLA EXE determ es that a ac te l m t s needed yo need to con ert the TUc a swer you get to TUa and then an LC50 enter t here

NO DATA / LC_{50}

NO DATA TUa

DILUTION SERIES TO RECOMMEND

Table 4

	Monitoring / Effluent	TUc	Limit / Effluent	TUc
D lution ser es based on data mean	32 7	3 0615379		
Dilution series to use for limit			14	7 1428571
Dilution factor to recommend	0 71 3134		0 3741657	
Dilution series to recommend	100 0	1 00	100 0	1 00
	7 2	1 5	37 4	2 67
	32 7	3 06	14 0	7 14
	13 7	5 36	5 2	19 09
	10 67	9 7	2 0	51 02
Extra dilutions if needed	6 10	16 40	0 7	136 36
	3 48	28 70	0 3	364 43

APPENDIX G

OTHER AGENCY COMMENTS / THREATENED AND ENDANGERED SPECIES SCREENING

United States Environmental Protection Agency (USEPA)
USEPA response to draft permit – June 12, 2014

Virginia Department of Health (VDH)
VDH memo – January 29, 2014

DEQ VPDES Permits Threatened and Endangered (T&E) Species Coordination Form
January 23, 2014

United States Fish and Wildlife Service (USFWS)
USFWS T&E response – January 27, 2014

Virginia Department of Conservation and Recreation (VDCR)
VDCR T&E letter – February 18, 2014
DEQ response letter – February 20, 2014

Tate, Robert (DEQ)

From: Smith, Mark [Smith.Mark@epa.gov]
Sent: Thursday, June 12, 2014 1:48 PM
To: Daub, Elleanore (DEQ); Tate, Robert (DEQ)
Cc: Trulear, Brian
Subject: FW: reissuance of VPDES Permit VA0062685 for the Pepper's Ferry Regional Wastewater Treatment Authority (6/12/14)

Hello Elleanore and Bob. We received the revised draft permit the Peppers Ferry Regional Wastewater treatment Authority (VA0062685) on 6/11/14. EPA exercised its discretion in the review of this State-submitted draft permit and has chosen to perform a limited review on the impaired waters requirements. As a result of this limited review of the draft permit, we have no comments related to the impaired waters. Thanks

---

From: Tate, Robert (DEQ) [mailto:Bob.Tate@deq.virginia.gov]
Sent: Wednesday, June 11, 2014 10:11 AM
To: Smith, Mark
Subject: FW: reissuance of VPDES Permit VA0062685 for the Pepper's Ferry Regional Wastewater Treatment Authority

Mark,

Permit Part I and the Fact Sheet have been revised to include wet weather sampling for PCBs.

Please see the following two documents posted at the DEQ site indicated in the previous message:
Permit Part I DRAFT revised 6-11-14 – PFRWTA;
Fact Sheet DRAFT revised 6-11-14 – PFRWTA.

Don't hesitate to contact me and discuss.

Bob

From: Tate, Robert (DEQ)
Sent: Thursday, May 15, 2014 3:45 PM
To: 'Smith, Mark'
Subject: reissuance of VPDES Permit VA0062685 for the Pepper's Ferry Regional Wastewater Treatment Authority

Mark,

VADEQ is in the process of reissuing VPDES Permit VA0062685 for the Pepper's Ferry Regional Wastewater Treatment Authority. The current permit expires September 30, 2014. Draft permit review by EPA is required because the facility is a major municipal.

Draft permit documents are posted at the DEQ site below:

F:\EPA\WCRO\DRAFT VA0062685 - Pepper's Ferry Regional WWTP

Please let me know if you need anything else.

Don't hesitate to contact me about anything related to this permit reissuance.

Bob Tate
water permit writer
DEQ - Blue Ridge Regional Office

COMMONWEALTH of VIRGINIA

Cynthia C. Romero, MD, FAAFP
State Health Commissioner

John J. Aulbach II, PE
Director, Office of Drinking Water

DEPARTMENT OF HEALTH
OFFICE OF DRINKING WATER
Abingdon Field Office

454 E. Main Street
Abingdon, VA 24210
Phone: 276-676-5650
Fax: 276-676-5659

VPDES REVIEW MEMORANDUM

County: Pulaski County
Sewerage - Peppers' Ferry WWTP
VPDES Application

To: Bob Tate, PE, Field Engineer
Department of Environmental Quality, Roanoke Regional Office

From: Dickie Puckett, P.E., Engineering Field Director
Office of Drinking Water, Abingdon Field Office

Date: January 29, 2014

Subject: VPDES Application Number VA0062685 (Existing discharge)

Owner: Pepper's Ferry Regional Wastewater Treatment Authority

Comments:

☒ There are no public water supply intakes located within 15 miles downstream of the discharge. We recommend a minimum Reliability Class III for this facility. We have no comments on the discharge.

Reviewer: Dean Henderson, District Engineer

cc: Pulaski County Health Department, Attn: Dr. Molly O'Dell

VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY	**VPDES PERMITS** **Threatened and Endangered Species Coordination**
To: ☒ DGIF, Environmental Review Coordinator ☒ DCR ☒ USFWS, T/E Review Coordinator **From: Bob Tate**	**Date Sent: January 23, 2014** **Permit Number: VA0062685**
Facility Name: Pepper's Ferry Regional Wastewater Treatment Authority **Contact: Clarke Wallcraft, Executive Director** **Phone: (540) 639-3947** **Address: P.O. Box 2950; Radford, VA 24143** **Facility Location: 7797 Mason Street (Pulaski Co.)** **Outfall Location (from application)** **Latitude: 37° 10' 59"** **Longitude: 80° 33' 43"** **USGS Quadrangle: Radford North, VA**	**Receiving Stream: New River** **Receiving Stream Flow Statistics (from 2009 permit reissuance)** **1 Day, 30-Year Low Flow: 409 MGD** **1 Day, 10-Year Low Flow: 436 MGD** **7 Day, 10-Year Low Flow: 546 MGD** **30 Day, 10-Year Low Flow: 634 MGD** **30 Day, 5-Year Low Flow: 712 MGD** **1 Day, 10-Year High Flow: 518 MGD** **7 Day, 10-Year High Flow: 761 MGD** **30 Day, 10-Year High Flow: 1056 MGD** **Harmonic Mean Flow: 1509 MGD**
Effluent Characteristics: 1 outfall discharging treated domestic and industrial wastewaters **Maximum Daily Flow: 12.8 MGD (recent 36 months)**	**Species Search Results (or attach database report and map)** **Identified aquatic threatened and endangered species: Roanoke Logperch, Big Sandy Crayfish, Orangefin Madtom**

Disinfection is by ultra-violet radiation. A draft permit has not yet been developed.

DGIF: ESSProjects@dgif.virginia.gov
DCR: nhreview@dcr.virginia.gov
USFWS: susan_lingenfelser@fws.gov and brett_hillman@fws.gov

From: Hillman, Brett [brett_hillman@fws.gov]
Sent: Monday, January 27, 2014 11:08 AM
To: Tate, Robert (DEQ)
Subject: Re: Reissuance of VPDES Permit VA0062685 - Pepper's Ferry Regional Wastewater Treatment Authority

Hi Bob,

Thanks for providing us with the opportunity to comment. The Roanoke logperch (*Percina rex*) is not known to occur in the New River, so, from a federally listed species perspective, I see no need to comment on this permit reissuance. However, I will applaud the use of UV treatment at this facility!

Hope all is well,
Brett

Brett Hillman
Fish and Wildlife Biologist
U.S. Fish & Wildlife Service
Virginia Field Office
6669 Short Lane
Gloucester, VA 23061

Phone: 804-693-6694 ext. 156
Fax: 804-693-9032
Email: brett_hillman@fws.gov

On Thu, Jan 23, 2014 at 1:49 PM, Tate, Robert (DEQ) <Bob.Tate@deq.virginia.gov> wrote:
VPDES Permit VA0062685 for the Pepper's Ferry Regional Wastewater Treatment Authority expires September 30, 2014. DEQ recently received a complete application for permit reissuance.

DEQ's VPDES Permits Threatened and Endangered Species Coordination form is attached.

Please review per the interagency VPDES Memo of Understanding from 2007.

DEQ intends to reissue this permit by June 30, 2014.

Don't hesitate to contact me about this permit reissuance.
Bob Tate
water permit writer
DEQ - Blue Ridge Regional Office
phone: 540-562-6774 (office) or 540-761-6188 (mobile)

Molly Joseph Ward
Secretary of Natural Resources

Joe Elton
Interim Director

COMMONWEALTH of VIRGINIA

DEPARTMENT OF CONSERVATION AND RECREATION

600 East Main Street, 24th Floor
Richmond, Virginia 23219
(804) 786-6124

February 18, 2014

Bob Tate
DEQ – Blue Ridge Regional Office
3019 Peters Creek Road
Roanoke, VA 24019

Re: VA0062685, Peppers Ferry Regional Wastewater Treatment Authority

Dear Mr. Tate:

The Department of Conservation and Recreation's Division of Natural Heritage (DCR) has searched its Biotics Data System for occurrences of natural heritage resources from the area outlined on the submitted map. Natural heritage resources are defined as the habitat of rare, threatened, or endangered plant and animal species, unique or exemplary natural communities, and significant geologic formations.

According to the information currently in our files, the Hellbender (*Cryptobranchus alleganiensis*, G3G4/S2S3/NL/NL) and the Green floater (*Lasmigona subviridis*, G3/S2/NL/LT) have been historically documented in the project vicinity. The Hellbender, a large, completely aquatic salamander, prefers larger, clear, and fast-flowing streams of the Mississippi drainage (Martof, et. al, 1980). In Virginia, it is documented from the Holston, Clinch, Powell and New River drainages (Pague, 1991). The Hellbender depends on cool, flowing, well-oxygenated water, and it needs a coarse (rocky) substrate (NatureServe, 2009).

Threats to this species include habitat alteration from impoundments or channelization, and water pollution (Pague, 1991). In agricultural areas, siltation may bury the rocky substrates it requires (NatureServe, 2009). In addition, Hellbenders do not tolerate human recreational use of their habitat (NatureServe, 2009).

The Green floater, a rare freshwater mussel, ranges from New York to North Carolina in the Atlantic Slope drainages, as well as the New and Kanawha River systems in Virginia and West Virginia (NatureServe, 2009). In Virginia, there are records from the New, Roanoke, Chowan, James, York, Rappahannock, and Potomac River drainages. Throughout its range, the Green floater appears to prefer the pools and eddies with gravel and sand bottoms of smaller rivers and creeks, smaller channels of large rivers (Ortman, 1919) or small to medium-sized streams (Riddick, 1973). Please note that this species has been listed as state threatened by the Virginia Department of Game and Inland Fisheries (VDGIF).

Considered good indicators of the health of aquatic ecosystems, freshwater mussels are dependent on good water quality, good physical habitat conditions, and an environment that will support populations of host fish species (Williams et al., 1993). Because mussels are sedentary organisms, they are sensitive to water quality degradation

related to increased sedimentation and pollution. They are also sensitive to habitat destruction through dam construction, channelization, and dredging, and the invasion of exotic mollusk species.

To minimize impacts to aquatic resources, DCR recommends the use of uv/ozone to replace chlorination disinfection and utilization of new technologies as they become available to improve water quality. DCR also recommends adhering to the proposed EPA standards for ammonia limits for freshwater mussels. Finally, due to the legal status of the Green floater, DCR recommends coordination with Virginia's regulatory authority for the management and protection of this species, the VDGIF, to ensure compliance with the Virginia Endangered Species Act (VA ST §§ 29.1-563 – 570).

There are no State Natural Area Preserves under DCR's jurisdiction in the project vicinity.

Under a Memorandum of Agreement established between the Virginia Department of Agriculture and Consumer Services (VDACS) and the DCR, DCR represents VDACS in comments regarding potential impacts on state-listed threatened and endangered plant and insect species. The current activity will not affect any documented state-listed plants or insects.

New and updated information is continually added to Biotics. Please contact DCR for an update on this natural heritage information if a significant amount of time passes before it is utilized.

The VDGIF maintains a database of wildlife locations, including threatened and endangered species, trout streams, and anadromous fish waters that may contain information not documented in this letter. Their database may be accessed from http://vafwis.org/fwis/ or contact Gladys Cason (804-367-0909 or Gladys.Cason@dgif.virginia.gov).

Should you have any questions or concerns, feel free to contact René Hypes at 804-371-2708. Thank you for the opportunity to comment on this project.

Sincerely,

S. René Hypes
Project Review Coordinator

CC: Ernie Aschenbach, VDGIF

Literature Cited

Martof, B.S., W.M. Palmer, J.R. Bailey, and J.R. Harrison III. 1980. Amphibians and reptiles of the Carolinas and Virginia. University of North Carolina Press. Chapel Hill, North Carolina.

NatureServe. 2009. NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1. NatureServe, Arlington, Virginia. Available http://www.natureserve.org/explorer. (Accessed: April 6, 2010).

Ortman, A.E. 1919. A monograph of the naiades of Pennsylvania, Part 3: Systematic account of the genera and species. Mem. Carnegie Mus. 8:1-384.

Pague, C.A. 1991. Hellbender. In Virginia's Endangered Species: Proceedings of a Symposium. K. Terwilliger ed. The McDonald and Woodward Publishing Company. Blacksburg, Virginia.

Riddick, M.B. 1973. Freshwater mussels of the Pamunkey River system, Virginia. M.S. Thesis, Virginia Commonwealth University, Richmond, VA 105pp.

Williams, J.D., M.L. Warren, Jr., K.S. Cummings, J.L. Harris, and R.J. Neves. 1993. Conservation status of freshwater mussels of the United States and Canada. Fisheries 18: 6-9.

COMMONWEALTH of VIRGINIA

David K. Paylor
Director

Molly Joseph Ward
Secretary of Natural Resources

DEPARTMENT OF ENVIRONMENTAL QUALITY
Blue Ridge Regional Office
www.deq.virginia.gov

Robert J. Weld
Regional Director

Lynchburg Office
7705 Timberlake Road
Lynchburg, Virginia 24502
(434) 582-5120
Fax (434) 582-5125

Roanoke Office
3019 Peters Creek Road
Roanoke, Virginia 24019
(540) 562-6700
Fax (540) 562-6725

February 20, 2014

S. René Hypes, Project Review Coordinator
Virginia Department of Conservation and Recreation
600 East Main Street, 24th Floor
Richmond, VA 23219

RE: Reissuance of VPDES Permit VA0062685 – Pepper's Ferry Regional Wastewater Treatment Authority

Dear Ms. Hypes:

This letter is the Virginia Department of Environmental Quality's (DEQ) response to your letter dated February 18, 2014, concerning reissuance of VPDES Permit VA0062685 for the Pepper's Ferry Regional Wastewater Treatment Authority (PFRWTA). Your letter identifies two species historically documented in the vicinity, *Cryptobranchus alleganiensis* (Hellbender) and *Lasmigona subviridis* (Green floater). Your letter indicates the Green floater has state legal status as a threatened species.

Your letter contains three recommendations:
1. "To minimize impacts to aquatic resources, DCR recommends the use of uv/ozone to replace chlorination disinfection and utilization of new technologies as they become available to improve water quality."
2. "DCR also recommends adhering to the proposed EPA standards for ammonia limits for freshwater mussels."
3. "Finally, due to the legal status of the Green floater, DCR recommends coordination with … VDGIF, to ensure compliance with the Virginia Endangered Species Act …."

The following are DEQ responses to the recommendations:
1. PFRWTA replaced chlorine disinfection with ultraviolet disinfection in July, 2012.
2. The only legally applicable ammonia criteria for evaluating potential ammonia toxicity are in Virginia's Water Quality Standards.
3. DEQ forwarded USFWS, VDGIF, and VDCR (by e-mail) a VPDES Permits Threatened and Endangered Species Coordination form on January 23, 2014. The form included screening information. However, the permit writer did not did not identify the Green floater on the form because he did not find the species identified in a VDGIF database search. VDGIF is copied on this letter.

If you have any questions or concerns about this permit reissuance, don't hesitate to contact me at 540-562-6774 or at bob.tate@deq.virginia.gov.

Sincerely,

Robert S. Tate
Water Permit Writer

CC: VDGIF – Ernie Aschenbach

APPENDIX H

PUBLIC COMMENT CORRESPONDENCE

Pepper's Ferry Regional Wastewater Treatment Authority (PFRWTA) Comment Letter - July 8, 2014
PFRWTA Follow-up E-Mail – July 9, 2014
DEQ Response Letter – July 17, 2014
PFRWTA Request for Public Hearing – July 18, 2014
DEQ Response Letter – August 14, 2014
PFRWTA Public Hearing Request Withdrawal – August 19, 2014

Pepper's Ferry Regional Wastewater Treatment Authority
P. O. Box 2950 • Radford, VA 24143-2950

July 8, 2014

Hand Delivered

Mr. Robert J. Weld
Director, BRRO
DEQ - Blue Ridge Regional Office - Roanoke
3019 Peters Creek Road
Roanoke, VA 24109

RECEIVED
JUL 8 2014
DEQ - BRRO

Re: Pepper's Ferry RWTA – VPDES Permit No. VA0062685; Draft VPDES Permit Reissuance - Comments

Dear Mr. Weld:

The Pepper's Ferry Regional Wastewater Treatment Authority (the "Authority") is in receipt of the draft permit (VPDES Permit No. VA0062685) proposed for reissuance to the Authority by the Virginia Department of Environmental Quality (the "DEQ"). The Authority appreciates the effort put forth by DEQ staff in the development of the draft permit proposed for reissuance; however, the Authority has significant concerns with the proposed permit as it currently drafted.

Attached please find the Authority's comments and concerns related to reissuance of the permit as currently drafted. I look forward to the opportunity of meeting with DEQ staff to discuss our comments and concerns prior to finalization and reissuance of the permit. Should you have any questions, please contact me at your convenience.

Sincerely,

R. Clarke Wallcraft

R. Clarke Wallcraft
Executive Director

Attachments

Cc: Correspondence File
Perm File

Area Code (540) 639-3947 • Fax (540) 633-0215

Pepper's Ferry Regional Wastewater Treatment Authority
P. O. Box 2950 - Radford, VA 24143-2950
Phone: 540-639-3947 Fax: 540-633-0215

PEPPER'S FERRY REGIONAL WASTEWATER TREATMENT AUTHORITY COMMENTS ON DRAFT PERMIT PROPOSED FOR REISSUANCE VPDES PERMIT NO. VA0062685

JULY 8, 2014

1. PART I B.11 – PCB MONITORING FOR TOTAL MAXIMUM DAILY LOAD (TMDL) DEVELOPMENT

The Pepper's Ferry Regional Wastewater Treatment Authority (the "Authority") strongly opposes PCB sampling requirements being extended into the proposed draft permit. The current permit requires the collection of two (2) dry weather event samples for PCB analysis, the requirement of which was fulfilled by the Authority. In the fifth year of the current permit cycle, the Authority was notified by the Virginia Department of Environmental Quality (the "DEQ") that the current permit contained an inadvertent error, and that there should also have been a requirement for two (2) wet weather event samples for PCB analysis. The Authority was given an option to obtain the two (2) wet weather samples under the current permit, or to have the requirement for wet weather PCB sampling extended into the new permit. The Authority is committed to accomplish the additional two (2) wet weather event samples prior to the end of the current permit cycle and, in fact, obtained the first sample the week of June 23, 2014. The second wet weather event sample will occur prior to the expiration of the current permit on September 30, 2014.

The Authority again states its strong opposition to the required use of EPA Method 1668 for total PCBs for monitoring and analysis. The basis for our opposition is that Method 1668 is disallowed by 40 CFR 136.1, and 40 CFR 136.1 is incorporated within the VPDES regulations.

The Authority also objects strongly to any reference to a PCB Pollutant Minimization Plan (PMP) in the proposed permit, particularly one that is based on any potential future (not yet in existence) TMDL Waste Load Allocation (WLA) being exceeded. Inserting the requirement for a PMP into a permit prior to a WLA being determined fails to provide adequate notice of the specific future requirement due to the future WLA being an unknown. The Authority simply cannot, nor should it be asked to, agree to a permit containing requirements that are based on some yet unknown quantities or values.

Finally, with regard to PCBs, the proposed permit includes the standard TMDL reopener language in Part I B.9. As such, the DEQ already has a mechanism to reopen the permit for any TMDL, which includes a TMDL for PCBs. Since the Authority will have accomplished all PCB sampling (both wet and dry weather events) by the end of the current permit cycle, it will have fulfilled its commitment to provide data (although our stated position is that the use of the data is drawn into question based on 40 CFR 136.1) to assist the DEQ with the TMDL development. Therefore, it is the Authority's position that

no additional TMDL reopener language beyond that identified in Part I B.9 is necessary and, as such, Part I B.11 should be removed in its entirety from the proposed permit.

2. PART I A.2 – LIMITATIONS AND MONITORING REQUIREMENTS – AMMONIA-N, Jun-Dec (18.0 MGD Tier)

The Authority questions the limited number of data points (stream data) used to develop the 90th percentile maximum for pH, which in turn significantly impacts the calculation for the Reasonable Potential threshold used to determine whether limitations for Ammonia-N are required. The Fact Sheet that supports the proposed draft permit indicates that a pH value of 8.3 standard units is representative of the 90th percentile for this section of the New River. Attached under "Exhibit A" please find a preponderance of pH data that supports a 90th percentile pH value of 7.9 standard units for this section of the New River. The Authority respectfully requests DEQ use the more representative pH value of 7.9 standard units in the calculation for the Reasonable Potential threshold used to determine whether an Ammonia-N limit is required.

3. PART I D.1.b – WHOLE EFFLUENT TOXICITY PROGRAM (9.0 MGD)

In the current permit, the endpoint used is "Chronic NOEC greater than or equal to 14% equivalent to a TUc of less than or equal to 7.14." The proposed draft permit indicates the endpoint used is "Chronic NOEC greater than or equal to 15% equivalent to a TUc of less than or equal to 6.66." In reviewing the WET test endpoints spreadsheet in Appendix F to the proposed draft permit Fact Sheet, it appears the "% flow to be used from MIX.EXE" value has changed from 3.1% to 2.67%. Please verify this change in value and indicate the driver for this change.

4. PART III – BIOSOLIDS

In general, the Authority objects to Part III of the proposed draft permit being presented in "track changes" format, as it can be interpreted that this portion of the permit is in a state of flux or subject to change. It is our opinion that the proposed draft permit should be complete from the perspective of DEQ before any advertisement that DEQ is receiving public comment regarding the proposed permit. Secondly, it appears that the entire biosolids regulations have been pasted into Part III of the proposed draft permit. As such, Part III of the proposed draft permit contains numerous acronyms that make the document confusing and difficult to navigate. Lastly, all notifications associated with the biosolids land application program are presumed to be made to the BRRO-Roanoke, since no other requirements are identified in the proposed draft permit. This may be problematic for DEQ and the Authority, in that it is unclear whether certain biosolids requirements are associated with the BRRO-Roanoke or the BRRO-Lynchburg. Attached under "Exhibit B" please find a list of potential conflicts related to notification requirements that may come into questions. This list should not be considered as an exhaustive list of potential notification issues as currently identified in the proposed draft permit.

Part III E.4.b – Notifications of Sign Posting – Paragraph b. requires written notification to the DEQ-BRRO and the chief executive officer or designee for the local government where the site is located, to include the DEQ Control Identification. Where can we obtain these numbers?

Part III J.2 – Other Special Conditions – The proposed draft permit references "Attachment A" as the document that identifies the approved land application sites associated with this permit. There is no "Attachment A" to the proposed draft permit, which could be construed as the Authority not having any approved land application sites at the issuance of this permit. This is obviously not the case, and therefore, the Authority objects to issuance of this permit without our approved land application sites being identified in "Attachment A" to the permit.

5. FACT SHEET – SPECIAL CONDITION TABLE (Bottom of Page 16)

We believe an error exists in this chart (red font) wherein reference is made to "DOC," and that the entire section in red font should be deleted.

EXHIBIT A

Pepper's Ferry RWTA
Sorted pH Data - 90th Percentile

Sorted pH Data	Sorted pH Data	Sorted pH Data	Sorted pH Data	Sorted pH Data	Sorted pH Data	Sorted pH Data	Sorted pH Data	Sorted pH Data	Sorted pH Data
9.20	8.20	8.00	7.90	7.90	7.80	7.80	7.70	7.70	7.60
9.00	8.20	8.00	7.90	7.90	7.80	7.80	7.70	7.70	7.60
8.90	8.20	8.00	7.90	7.90	7.80	7.80	7.70	7.70	7.60
8.80	8.20	8.00	7.90	7.90	7.80	7.80	7.70	7.70	7.60
8.80	8.20	8.00	7.90	7.90	7.80	7.80	7.70	7.70	7.60
8.70	8.20	8.00	7.90	7.90	7.80	7.80	7.70	7.70	7.60
8.70	8.20	8.00	7.90	7.90	7.80	7.80	7.70	7.70	7.60
8.70	8.20	8.00	7.90	7.90	7.80	7.80	7.70	7.70	7.60
8.60	8.20	8.00	7.90	7.90	7.80	7.80	7.70	7.70	7.60
8.60	8.20	8.00	7.90	7.90	7.80	7.80	7.70	7.70	7.60
8.60	8.20	8.00	7.90	7.90	7.80	7.80	7.70	7.70	7.60
8.60	8.10	8.00	7.90	7.90	7.80	7.80	7.70	7.70	7.60
8.60	8.10	8.00	7.90	7.90	7.80	7.80	7.70	7.70	7.60
8.50	8.10	8.00	7.90	7.90	7.80	7.70	7.70	7.70	7.60
8.50	8.10	8.00	7.90	7.90	7.80	7.70	7.70	7.70	7.60
8.50	8.10	8.00	7.90	7.90	7.80	7.70	7.70	7.70	7.60
8.50	8.10	8.00	7.90	7.90	7.80	7.70	7.70	7.70	7.60
8.40	8.10	8.00	7.90	7.90	7.80	7.70	7.70	7.70	7.60
8.40	8.10	8.00	7.90	7.90	7.80	7.70	7.70	7.70	7.60
8.40	8.10	8.00	7.90	7.90	7.80	7.70	7.70	7.70	7.60
8.40	8.10	8.00	7.90	7.90	7.80	7.70	7.70	7.70	7.60
8.40	8.10	8.00	7.90	7.90	7.80	7.70	7.70	7.70	7.60
8.40	8.10	8.00	7.90	7.90	7.80	7.70	7.70	7.70	7.60
8.40	8.10	8.00	7.90	7.80	7.80	7.70	7.70	7.70	7.60
8.40	8.10	8.00	7.90	7.80	7.80	7.70	7.70	7.70	7.60
8.40	8.10	8.00	7.90	7.80	7.80	7.70	7.70	7.70	7.60
8.40	8.10	8.00	7.90	7.80	7.80	7.70	7.70	7.70	7.60
8.30	8.10	8.00	7.90	7.80	7.80	7.70	7.70	7.70	7.60
8.30	8.10	8.00	7.90	7.80	7.80	7.70	7.70	7.70	7.60
8.30	8.10	8.00	7.90	7.80	7.80	7.70	7.70	7.70	7.60
8.30	8.10	8.00	7.90	7.80	7.80	7.70	7.70	7.70	7.60
8.30	8.10	8.00	7.90	7.80	7.80	7.70	7.70	7.70	7.60
8.30	8.10	8.00	7.90	7.80	7.80	7.70	7.70	7.70	7.60
8.30	8.10	8.00	7.90	7.80	7.80	7.70	7.70	7.70	7.60
8.30	8.10	8.00	7.90	7.80	7.80	7.70	7.70	7.70	7.60
8.30	8.10	8.00	7.90	7.80	7.80	7.70	7.70	7.70	7.60
8.30	8.10	8.00	7.90	7.80	7.80	7.70	7.70	7.70	7.60
8.30	8.00	8.00	7.90	7.80	7.80	7.70	7.70	7.70	7.60
8.30	8.00	7.90	7.90	7.80	7.80	7.70	7.70	7.70	7.60
8.30	8.00	7.90	7.90	7.80	7.80	7.70	7.70	7.70	7.60
8.30	8.00	7.90	7.90	7.80	7.80	7.70	7.70	7.70	7.60
8.30	8.00	7.90	7.90	7.80	7.80	7.70	7.70	7.70	7.60
8.30	8.00	7.90	7.90	7.80	7.80	7.70	7.70	7.70	7.60
8.20	8.00	7.90	7.90	7.80	7.80	7.70	7.70	7.70	7.60
8.20	8.00	7.90	7.90	7.80	7.80	7.70	7.70	7.70	7.60
8.20	8.00	7.90	7.90	7.80	7.80	7.70	7.70	7.70	7.60
8.20	8.00	7.90	7.90	7.80	7.80	7.70	7.70	7.70	7.60
8.20	8.00	7.90	7.90	7.80	7.80	7.70	7.70	7.70	7.60
8.20	8.00	7.90	7.90	7.80	7.80	7.70	7.70	7.70	7.60
8.20	8.00	7.90	7.90	7.80	7.80	7.70	7.70	7.70	7.60
8.20	8.00	7.90	7.90	7.80	7.80	7.70	7.70	7.60	7.60
8.20	8.00	7.90	7.90	7.80	7.80	7.70	7.70	7.60	7.60

Pepper's Ferry RWTA
Sorted pH Data - 90th Percentile

Sorted pH Data	Sorted pH Data	Sorted pH Data	Sorted pH Data	Sorted pH Data	Sorted pH Data	Sorted pH Data	Sorted pH Data	Sorted pH Data	Sorted pH Data
7.60	7.60	7.60	7.50	7.50	7.50	7.50	7.40	7.40	7.40
7.60	7.60	7.60	7.50	7.50	7.50	7.50	7.40	7.40	7.40
7.60	7.60	7.60	7.50	7.50	7.50	7.50	7.40	7.40	7.40
7.60	7.60	7.60	7.50	7.50	7.50	7.50	7.40	7.40	7.40
7.60	7.60	7.60	7.50	7.50	7.50	7.50	7.40	7.40	7.40
7.60	7.60	7.60	7.50	7.50	7.50	7.40	7.40	7.40	7.40
7.60	7.60	7.60	7.50	7.50	7.50	7.40	7.40	7.40	7.40
7.60	7.60	7.60	7.50	7.50	7.50	7.40	7.40	7.40	7.40
7.60	7.60	7.60	7.50	7.50	7.50	7.40	7.40	7.40	7.40
7.60	7.60	7.60	7.50	7.50	7.50	7.40	7.40	7.40	7.40
7.60	7.60	7.60	7.50	7.50	7.50	7.40	7.40	7.40	7.40
7.60	7.60	7.60	7.50	7.50	7.50	7.40	7.40	7.40	7.40
7.60	7.60	7.60	7.50	7.50	7.50	7.40	7.40	7.40	7.40
7.60	7.60	7.60	7.50	7.50	7.50	7.40	7.40	7.40	7.40
7.60	7.60	7.60	7.50	7.50	7.50	7.40	7.40	7.40	7.40
7.60	7.60	7.60	7.50	7.50	7.50	7.40	7.40	7.40	7.40
7.60	7.60	7.60	7.50	7.50	7.50	7.40	7.40	7.40	7.40
7.60	7.60	7.60	7.50	7.50	7.50	7.40	7.40	7.40	7.40
7.60	7.60	7.60	7.50	7.50	7.50	7.40	7.40	7.40	7.40
7.60	7.60	7.60	7.50	7.50	7.50	7.40	7.40	7.40	7.40
7.60	7.60	7.50	7.50	7.50	7.50	7.40	7.40	7.40	7.40
7.60	7.60	7.50	7.50	7.50	7.50	7.40	7.40	7.40	7.40
7.60	7.60	7.50	7.50	7.50	7.50	7.40	7.40	7.40	7.40
7.60	7.60	7.50	7.50	7.50	7.50	7.40	7.40	7.40	7.40
7.60	7.60	7.50	7.50	7.50	7.50	7.40	7.40	7.40	7.40
7.60	7.60	7.50	7.50	7.50	7.50	7.40	7.40	7.40	7.40
7.60	7.60	7.50	7.50	7.50	7.50	7.40	7.40	7.40	7.40
7.60	7.60	7.50	7.50	7.50	7.50	7.40	7.40	7.40	7.40
7.60	7.60	7.50	7.50	7.50	7.50	7.40	7.40	7.40	7.40
7.60	7.60	7.50	7.50	7.50	7.50	7.40	7.40	7.40	7.40
7.60	7.60	7.50	7.50	7.50	7.50	7.40	7.40	7.40	7.40
7.60	7.60	7.50	7.50	7.50	7.50	7.40	7.40	7.40	7.40
7.60	7.60	7.50	7.50	7.50	7.50	7.40	7.40	7.40	7.40
7.60	7.60	7.50	7.50	7.50	7.50	7.40	7.40	7.40	7.40
7.60	7.60	7.50	7.50	7.50	7.50	7.40	7.40	7.40	7.40
7.60	7.60	7.50	7.50	7.50	7.50	7.40	7.40	7.40	7.40
7.60	7.60	7.50	7.50	7.50	7.50	7.40	7.40	7.40	7.40
7.60	7.60	7.50	7.50	7.50	7.50	7.40	7.40	7.40	7.40
7.60	7.60	7.50	7.50	7.50	7.50	7.40	7.40	7.40	7.40
7.60	7.60	7.50	7.50	7.50	7.50	7.40	7.40	7.40	7.40
7.60	7.60	7.50	7.50	7.50	7.50	7.40	7.40	7.40	7.40
7.60	7.60	7.50	7.50	7.50	7.50	7.40	7.40	7.40	7.40
7.60	7.60	7.50	7.50	7.50	7.50	7.40	7.40	7.40	7.40
7.60	7.60	7.50	7.50	7.50	7.50	7.40	7.40	7.40	7.40
7.60	7.60	7.50	7.50	7.50	7.50	7.40	7.40	7.40	7.40
7.60	7.60	7.50	7.50	7.50	7.50	7.40	7.40	7.40	7.30
7.60	7.60	7.50	7.50	7.50	7.50	7.40	7.40	7.40	7.30
7.60	7.60	7.50	7.50	7.50	7.50	7.40	7.40	7.40	7.30
7.60	7.60	7.50	7.50	7.50	7.50	7.40	7.40	7.40	7.30
7.60	7.60	7.50	7.50	7.50	7.50	7.40	7.40	7.40	7.30
7.60	7.60	7.50	7.50	7.50	7.50	7.40	7.40	7.40	7.30

Pepper's Ferry RWTA
Sorted pH Data - 90th Percentile

Sorted pH Data	Sorted pH Data	Sorted pH Data	Sorted pH Data	Sorted pH Data	Sorted pH Data	Sorted pH Data	Sorted pH Data	Sorted pH Data	Sorted pH Data
7.30	7.30	7.30	7.20	7.20	7.20	7.10	7.10	7.10	7.00
7.30	7.30	7.30	7.20	7.20	7.20	7.10	7.10	7.10	7.00
7.30	7.30	7.30	7.20	7.20	7.20	7.10	7.10	7.10	7.00
7.30	7.30	7.30	7.20	7.20	7.20	7.10	7.10	7.10	7.00
7.30	7.30	7.30	7.20	7.20	7.20	7.10	7.10	7.10	7.00
7.30	7.30	7.30	7.20	7.20	7.20	7.10	7.10	7.10	7.00
7.30	7.30	7.30	7.20	7.20	7.20	7.10	7.10	7.00	7.00
7.30	7.30	7.30	7.20	7.20	7.20	7.10	7.10	7.00	7.00
7.30	7.30	7.30	7.20	7.20	7.20	7.10	7.10	7.00	7.00
7.30	7.30	7.30	7.20	7.20	7.20	7.10	7.10	7.00	7.00
7.30	7.30	7.30	7.20	7.20	7.20	7.10	7.10	7.00	7.00
7.30	7.30	7.30	7.20	7.20	7.20	7.10	7.10	7.00	7.00
7.30	7.30	7.30	7.20	7.20	7.20	7.10	7.10	7.00	7.00
7.30	7.30	7.30	7.20	7.20	7.20	7.10	7.10	7.00	7.00
7.30	7.30	7.30	7.20	7.20	7.20	7.10	7.10	7.00	7.00
7.30	7.30	7.30	7.20	7.20	7.20	7.10	7.10	7.00	7.00
7.30	7.30	7.30	7.20	7.20	7.20	7.10	7.10	7.00	7.00
7.30	7.30	7.30	7.20	7.20	7.20	7.10	7.10	7.00	7.00
7.30	7.30	7.30	7.20	7.20	7.20	7.10	7.10	7.00	7.00
7.30	7.30	7.30	7.20	7.20	7.20	7.10	7.10	7.00	7.00
7.30	7.30	7.30	7.20	7.20	7.20	7.10	7.10	7.00	7.00
7.30	7.30	7.30	7.20	7.20	7.20	7.10	7.10	7.00	7.00
7.30	7.30	7.30	7.20	7.20	7.20	7.10	7.10	7.00	7.00
7.30	7.30	7.30	7.20	7.20	7.20	7.10	7.10	7.00	7.00
7.30	7.30	7.30	7.20	7.20	7.20	7.10	7.10	7.00	7.00
7.30	7.30	7.30	7.20	7.20	7.20	7.10	7.10	7.00	7.00
7.30	7.30	7.30	7.20	7.20	7.20	7.10	7.10	7.00	7.00
7.30	7.30	7.30	7.20	7.20	7.20	7.10	7.10	7.00	7.00
7.30	7.30	7.30	7.20	7.20	7.20	7.10	7.10	7.00	7.00
7.30	7.30	7.30	7.20	7.20	7.14	7.10	7.10	7.00	7.00
7.30	7.30	7.30	7.20	7.20	7.10	7.10	7.10	7.00	7.00
7.30	7.30	7.30	7.20	7.20	7.10	7.10	7.10	7.00	7.00
7.30	7.30	7.30	7.20	7.20	7.10	7.10	7.10	7.00	7.00
7.30	7.30	7.30	7.20	7.20	7.10	7.10	7.10	7.00	7.00
7.30	7.30	7.30	7.20	7.20	7.10	7.10	7.10	7.00	7.00
7.30	7.30	7.30	7.20	7.20	7.10	7.10	7.10	7.00	7.00
7.30	7.30	7.30	7.20	7.20	7.10	7.10	7.10	7.00	7.00
7.30	7.30	7.30	7.20	7.20	7.10	7.10	7.10	7.00	7.00
7.30	7.30	7.30	7.20	7.20	7.10	7.10	7.10	7.00	7.00
7.30	7.30	7.30	7.20	7.20	7.10	7.10	7.10	7.00	7.00
7.30	7.30	7.30	7.20	7.20	7.10	7.10	7.10	7.00	7.00
7.30	7.30	7.30	7.20	7.20	7.10	7.10	7.10	7.00	7.00
7.30	7.30	7.30	7.20	7.20	7.10	7.10	7.10	7.00	7.00
7.30	7.30	7.30	7.20	7.20	7.10	7.10	7.10	7.00	7.00
7.30	7.30	7.30	7.20	7.20	7.10	7.10	7.10	7.00	7.00
7.30	7.30	7.30	7.20	7.20	7.10	7.10	7.10	7.00	7.00
7.30	7.30	7.30	7.20	7.20	7.10	7.10	7.10	7.00	7.00
7.30	7.30	7.30	7.20	7.20	7.10	7.10	7.10	7.00	7.00
7.30	7.30	7.30	7.20	7.20	7.10	7.10	7.10	7.00	7.00
7.30	7.30	7.20	7.20	7.20	7.10	7.10	7.10	7.00	7.00
7.30	7.30	7.20	7.20	7.20	7.10	7.10	7.10	7.00	7.00
7.30	7.30	7.20	7.20	7.20	7.10	7.10	7.10	7.00	6.90
7.30	7.30	7.20	7.20	7.20	7.10	7.10	7.10	7.00	6.90
7.30	7.30	7.20	7.20	7.20	7.10	7.10	7.10	7.00	6.90

Pepper's Ferry RWTA
Sorted pH Data - 90th Percentile

Sorted pH Data	Sorted pH Data	Sorted pH Data	Sorted pH Data	Sorted pH Data	Sorted pH Data	Sorted pH Data	Sorted pH Data	Sorted pH Data	Sorted pH Data
6.90	6.80	6.70	6.60						
6.90	6.80	6.70	6.60						
6.90	6.80	6.70	6.60						
6.90	6.80	6.70	6.60						
6.90	6.80	6.70	6.60						
6.90	6.80	6.70	6.60						
6.90	6.80	6.70	6.60						
6.90	6.80	6.70	6.60						
6.90	6.80	6.70	6.60						
6.90	6.80	6.70	6.60						
6.90	6.80	6.70	6.60						
6.90	6.80	6.70	6.60						
6.90	6.80	6.70	6.60						
6.90	6.80	6.70	6.60						
6.90	6.80	6.70	6.60						
6.90	6.80	6.70	6.60						
6.90	6.80	6.70	6.60						
6.90	6.80	6.70	6.60						
6.90	6.80	6.70	6.60						
6.90	6.80	6.70	6.50						
6.90	6.80	6.70	6.50						
6.90	6.80	6.70	6.50						
6.90	6.80	6.70	6.40						
6.90	6.80	6.70	6.40						
6.90	6.80	6.70	6.40						
6.90	6.80	6.70	6.40						
6.90	6.80	6.70	6.40						
6.90	6.80	6.70	6.40						
6.90	6.80	6.70	6.30						
6.90	6.80	6.70	6.30						
6.90	6.80	6.70	6.30						
6.90	6.80	6.70	6.30						
6.90	6.80	6.70							
6.90	6.80	6.70							
6.90	6.80	6.70							
6.90	6.80	6.70							
6.90	6.80	6.70							
6.90	6.80	6.70							
6.90	6.80	6.70							
6.90	6.80	6.70							
6.90	6.80	6.70							
6.90	6.80	6.70							
6.90	6.80	6.70							
6.90	6.80	6.70							
6.90	6.80	6.70							
6.90	6.80	6.70							
6.90	6.70	6.70							
6.90	6.70	6.70							
6.90	6.70	6.70							
6.90	6.70	6.60							
6.90	6.70	6.60							
6.90	6.70	6.60							
6.80	6.70	6.60							
6.80	6.70	6.60							

Pepper's Ferry RWTA
pH Data - 90th Percentile Development

Date	RAAP WTP Maximum RAW pH	NRV Reg. Water Authority Maximum RAW pH	RAAP WTP Minimum RAW pH	NRV Reg. Water Authority Minimum RAW pH
1/1/2013	7.70		7.40	
1/2/2013	7.80		7.60	
1/3/2013	7.90		7.60	
1/4/2013	7.90		7.60	
1/5/2013	7.90		7.70	
1/6/2013	7.90		7.60	
1/7/2013	8.00		7.70	
1/8/2013	7.90		7.70	
1/9/2013	7.80		7.20	
1/10/2013	7.50		7.20	
1/11/2013	7.80		7.30	
1/12/2013	7.70		7.60	
1/13/2013	7.80		7.60	
1/14/2013	8.10		7.50	
1/15/2013	7.80		7.50	
1/16/2013	7.90		7.50	
1/17/2013	8.00		7.80	
1/18/2013	8.40		7.20	
1/19/2013	7.50		7.30	
1/20/2013	7.50		7.20	
1/21/2013	7.50		7.30	
1/22/2013	7.70		7.50	
1/23/2013	8.00		7.50	
1/24/2013	8.10		7.60	
1/25/2013	8.20		7.70	
1/26/2013	8.40		7.70	
1/27/2013	8.20		7.70	
1/28/2013	7.90		7.60	
1/29/2013	7.70		7.40	
1/30/2013	7.60		7.50	
1/31/2013	7.70		7.50	
2/1/2013	8.10		7.40	
2/2/2013	8.40		7.50	
2/3/2013	8.10		7.70	
2/4/2013	9.00		7.70	
2/5/2013	8.10		7.60	
2/6/2013	8.00		7.70	
2/7/2013	8.40		7.30	
2/8/2013	8.10		7.50	
2/9/2013	7.90		7.60	
2/10/2013	7.80		7.50	
2/11/2013	7.60		7.40	
2/12/2013	7.70		7.50	
2/13/2013	7.90		7.50	
2/14/2013	7.70		7.40	
2/15/2013	7.50		7.30	
2/16/2013	7.50		7.40	
2/17/2013	7.60		7.30	
2/18/2013	7.60		7.40	
2/19/2013	7.60		7.30	
2/20/2013	7.60		7.40	
2/21/2013	7.70		7.40	
2/22/2013	7.80		7.50	
2/23/2013	7.80		7.60	

Pepper's Ferry RWTA
pH Data - 90th Percentile Development

Date	RAAP WTP Maximum RAW pH	NRV Reg. Water Authority Maximum RAW pH	RAAP WTP Minimum RAW pH	NRV Reg. Water Authority Minimum RAW pH
2/24/2013	7.90		7.60	
2/25/2013	7.80		7.40	
2/26/2013	7.50		7.40	
2/27/2013	7.60		7.20	
2/28/2013	7.60		7.30	
3/1/2013	7.80		7.40	
3/2/2013	7.80		7.60	
3/3/2013	7.80		7.60	
3/4/2013	7.90		7.60	
3/5/2013	8.30		7.70	
3/6/2013	8.10		7.70	
3/7/2013	7.90		7.40	
3/8/2013	7.50		7.40	
3/9/2013	7.80		7.50	
3/10/2013	7.80		7.60	
3/11/2013	7.80		7.50	
3/12/2013	7.90		7.60	
3/13/2013	8.30		7.70	
3/14/2013	8.10		7.60	
3/15/2013	8.00		7.80	
3/16/2013	7.90		7.60	
3/17/2013	7.70		7.50	
3/18/2013	7.70		7.50	
3/19/2013	7.90		7.40	
3/20/2013	7.90		7.60	
3/21/2013	7.90		7.70	
3/22/2013	8.20		7.70	
3/23/2013	8.10		7.70	
3/24/2013	8.00		7.70	
3/25/2013	7.90		7.60	
3/26/2013	7.90		7.70	
3/27/2013	8.00		7.60	
3/28/2013	8.00		7.60	
3/29/2013	8.30		7.70	
3/30/2013	8.30		7.70	
3/31/2013	8.00		7.60	
4/1/2013	8.10		7.60	
4/2/2013	8.50		7.80	
4/3/2013	8.50		7.80	
4/4/2013	8.30		7.70	
4/5/2013	8.20		7.50	
4/6/2013	8.50		7.60	
4/7/2013	8.40		7.60	
4/8/2013	8.70		7.70	
4/9/2013	8.60		7.80	
4/10/2013	8.90		7.80	
4/11/2013	8.60		7.70	
4/12/2013	8.10		7.50	
4/13/2013	8.00		7.70	
4/14/2013	7.90		7.60	
4/15/2013	7.60		7.40	
4/16/2013	8.10		7.50	
4/17/2013	8.00		7.40	
4/18/2013	8.00		7.60	

Pepper's Ferry RWTA
pH Data - 90th Percentile Development

Date	RAAP WTP Maximum RAW pH	NRV Reg. Water Authority Maximum RAW pH	RAAP WTP Minimum RAW pH	NRV Reg. Water Authority Minimum RAW pH
4/19/2013	7.70		7.60	
4/20/2013	8.20		7.60	
4/21/2013	7.90		7.50	
4/22/2013	8.00		7.50	
4/23/2013	7.80		7.60	
4/24/2013	8.30		7.60	
4/25/2013	8.70		7.60	
4/26/2013	8.80		7.80	
4/27/2013	8.60		7.60	
4/28/2013	7.90		7.50	
4/29/2013	8.60		7.60	
4/30/2013	8.30		7.50	
5/1/2013	8.30		7.70	
5/2/2013	8.40		7.80	
5/3/2013	8.40		7.60	
5/4/2013	8.00		7.60	
5/5/2013	8.10		7.70	
5/6/2013	7.90		7.60	
5/7/2013	8.00		7.60	
5/8/2013	8.10		7.70	
5/9/2013	8.10		7.70	
5/10/2013	7.70		7.40	
5/11/2013	7.50		7.20	
5/12/2013	7.70		7.30	
5/13/2013	7.70		7.30	
5/14/2013	7.70		7.30	
5/15/2013	7.80		7.60	
5/16/2013	7.90		7.60	
5/17/2013	8.00		7.50	
5/18/2013	7.90		7.60	
5/19/2013	7.80		7.60	
5/20/2013	8.00		7.60	
5/21/2013	7.90		7.40	
5/22/2013	7.80		7.50	
5/23/2013	7.60		7.50	
5/24/2013	7.90		7.50	
5/25/2013	7.80		7.60	
5/26/2013	7.80		7.50	
5/27/2013	7.90		7.50	
5/28/2013	7.90		7.50	
5/29/2013	8.30		7.80	
5/30/2013	8.10		7.40	
5/31/2013	7.90		7.30	
6/1/2013	8.00	8.20	7.50	7.10
6/2/2013	7.80	7.90	7.40	6.90
6/3/2013	7.90	8.20	7.20	7.10
6/4/2013	8.10	8.30	7.30	7.10
6/5/2013	7.90	8.00	7.20	7.10
6/6/2013	7.80	7.70	7.30	6.90
6/7/2013	7.60	7.20	7.20	7.00
6/8/2013	7.80	7.50	7.40	6.80
6/9/2013	7.70	7.60	7.20	7.00
6/10/2013	7.50	7.30	7.10	7.00
6/11/2013	7.60	7.30	7.10	7.00

Pepper's Ferry RWTA
pH Data - 90th Percentile Development

Date	RAAP WTP Maximum RAW pH	NRV Reg. Water Authority Maximum RAW pH	RAAP WTP Minimum RAW pH	NRV Reg. Water Authority Minimum RAW pH
6/12/2013	7.70	7.30	7.30	7.10
6/13/2013	7.90	7.30	7.50	7.00
6/14/2013	8.00	7.40	7.60	7.00
6/15/2013	8.10	7.90	7.60	7.00
6/16/2013	8.00	7.50	7.60	7.00
6/17/2013	8.00	7.60	7.30	7.00
6/18/2013	7.60	7.50	7.30	7.00
6/19/2013	7.80	7.30	7.50	7.00
6/20/2013	7.90	7.40	7.40	7.00
6/21/2013	8.30	7.80	7.40	6.90
6/22/2013	8.50	7.90	7.40	7.00
6/23/2013	8.60	8.10	7.60	7.00
6/24/2013	8.40	7.90	7.20	7.00
6/25/2013	9.20	7.70	7.40	7.00
6/26/2013	8.10	7.50	7.40	6.90
6/27/2013	7.60	7.70	7.10	7.00
6/28/2013	7.90	7.90	7.00	7.00
6/29/2013	7.90	8.10	7.30	7.00
6/30/2013	8.20	7.90	7.30	7.00
7/1/2013	8.00	7.70	7.10	6.90
7/2/2013	7.70	7.30	7.30	7.00
7/3/2013	7.80	7.10	7.20	7.00
7/4/2013	7.80	7.20	7.60	6.80
7/5/2013	7.70	7.00	7.60	6.90
7/6/2013	7.70	7.00	7.30	6.90
7/7/2013	7.40	7.10	7.20	6.90
7/8/2013	7.50	7.10	7.20	6.80
7/9/2013	7.40	7.10	7.30	7.00
7/10/2013	7.50	7.10	7.30	6.90
7/11/2013	7.80	7.10	7.30	7.00
7/12/2013	7.70	7.10	7.50	7.00
7/13/2013	7.70	7.10	7.50	7.00
7/14/2013	7.80	7.20	7.40	7.00
7/15/2013	8.00	7.20	7.60	7.00
7/16/2013	7.80	7.30	7.40	7.00
7/17/2013	7.70	7.20	7.30	6.70
7/18/2013	7.70	6.90	7.30	6.70
7/19/2013	7.70	6.90	7.50	6.60
7/20/2013	7.80	6.90	7.50	6.60
7/21/2013	8.00	6.90	7.40	6.60
7/22/2013	8.70	7.00	7.70	6.60
7/23/2013	8.20	7.10	7.70	6.60
7/24/2013	8.20	7.10	7.70	6.60
7/25/2013	8.00	7.30	7.50	6.60
7/26/2013	7.90	7.20	7.40	6.60
7/27/2013	7.40	7.20	7.20	6.70
7/28/2013	7.50	7.00	7.30	6.80
7/29/2013	7.60	6.90	7.30	6.80
7/30/2013	7.70	6.90	7.30	6.60
7/31/2013	7.50	6.70	7.30	6.60
8/1/2013	7.40	6.60	7.30	6.50
8/2/2013	7.50	6.60	7.10	6.40
8/3/2013	7.60	6.60	7.20	6.50
8/4/2013	7.50	6.60	7.20	6.60

Pepper's Ferry RWTA
pH Data - 90th Percentile Development

Date	RAAP WTP Maximum RAW pH	NRV Reg. Water Authority Maximum RAW pH	RAAP WTP Minimum RAW pH	NRV Reg. Water Authority Minimum RAW pH
8/5/2013	7.70	6.80	7.10	6.60
8/6/2013	7.60	6.90	7.30	6.80
8/7/2013	7.50	7.20	7.30	7.00
8/8/2013	7.70	7.30	7.30	7.20
8/9/2013	7.80	7.20	7.30	7.10
8/10/2013	8.00	7.10	7.40	6.50
8/11/2013	7.90	6.60	7.20	6.30
8/12/2013	8.00	6.60	7.40	6.30
8/13/2013	8.00	6.40	7.40	6.30
8/14/2013	7.90	6.40	7.30	6.30
8/15/2013	8.00	7.70	7.30	6.40
8/16/2013	7.90	7.90	7.20	6.40
8/17/2013	7.70	7.50	7.10	6.70
8/18/2013	7.60	7.10	7.10	6.70
8/19/2013	7.70	7.00	7.30	6.60
8/20/2013	7.80	7.10	7.60	6.70
8/21/2013	7.90	7.10	7.60	6.60
8/22/2013	7.60	7.00	7.20	6.70
8/23/2013	7.40	7.20	7.10	6.60
8/24/2013	7.70	7.40	7.20	6.70
8/25/2013	7.90	7.20	7.40	6.70
8/26/2013	8.20	7.60	7.50	6.70
8/27/2013	7.90	7.40	7.50	6.80
8/28/2013	7.80	7.30	7.40	6.80
8/29/2013	8.20	7.40	7.60	6.70
8/30/2013	8.00	7.50	7.40	6.70
8/31/2013	7.70	7.30	7.30	6.70
9/1/2013	7.80	7.30	7.30	6.70
9/2/2013	7.80	7.60	7.30	6.80
9/3/2013	8.00	7.90	7.40	6.70
9/4/2013	8.30	8.20	7.40	7.00
9/5/2013	8.40	8.20	7.60	6.90
9/6/2013	8.00	7.90	7.60	6.90
9/7/2013	8.00	7.70	7.70	6.80
9/8/2013	8.00	7.50	7.40	6.70
9/9/2013	7.70	7.30	7.30	6.80
9/10/2013	7.90	7.40	7.20	6.70
9/11/2013	7.80	7.50	7.20	6.70
9/12/2013	8.00	7.40	7.30	6.80
9/13/2013	8.00	7.60	7.30	6.70
9/14/2013	8.00	7.60	7.30	6.70
9/15/2013	8.20	7.40	7.40	6.80
9/16/2013	8.00	7.20	7.50	6.80
9/17/2013	7.80	7.40	7.60	6.80
9/18/2013	8.00	7.20	7.50	6.80
9/19/2013	7.70	7.00	7.20	6.70
9/20/2013	7.50	7.20	7.20	6.70
9/21/2013	7.40	7.00	7.20	6.70
9/22/2013	7.60	7.10	7.30	6.70
9/23/2013	7.70	7.00	7.50	6.70
9/24/2013	7.70	7.00	7.40	6.70
9/25/2013	7.70	7.00	7.50	6.60
9/26/2013	7.90	7.10	7.30	6.70
9/27/2013	7.70	7.20	7.40	6.80

Pepper's Ferry RWTA
pH Data - 90th Percentile Development

Date	RAAP WTP Maximum RAW pH	NRV Reg. Water Authority Maximum RAW pH	RAAP WTP Minimum RAW pH	NRV Reg. Water Authority Minimum RAW pH
9/28/2013	7.80	7.10	7.40	6.70
9/29/2013	7.70	7.10	7.30	6.80
9/30/2013	7.70	7.10	7.40	6.80
10/1/2013	7.70	7.20	7.30	6.70
10/2/2013	7.70	7.30	7.40	6.80
10/3/2013	7.80	7.20	7.20	6.80
10/4/2013	7.90	7.20	7.40	6.70
10/5/2013	7.70	7.10	7.40	6.60
10/6/2013	7.90	7.00	7.30	6.70
10/7/2013	8.00	7.00	7.30	6.70
10/8/2013	7.80	6.90	7.40	6.70
10/9/2013	7.60	7.00	7.10	6.70
10/10/2013	7.50	7.00	7.30	6.70
10/11/2013	7.70	7.00	7.20	6.70
10/12/2013	7.70	7.00	7.50	6.70
10/13/2013	7.90	6.90	7.50	6.70
10/14/2013	7.80	7.00	7.50	6.70
10/15/2013	7.90	7.10	7.60	6.70
10/16/2013	8.00	7.10	7.60	6.70
10/17/2013	8.00	7.00	7.30	6.70
10/18/2013	7.70	7.20	7.40	6.70
10/19/2013	7.70	7.10	7.60	6.80
10/20/2013	7.70	7.40	7.50	6.80
10/21/2013	8.10	7.40	7.30	6.90
10/22/2013	7.90	7.10	7.50	6.80
10/23/2013	8.00	7.30	7.50	6.80
10/24/2013	8.00	7.10	7.20	6.90
10/25/2013	7.70	7.20	7.40	6.90
10/26/2013	7.70	7.40	7.40	6.80
10/27/2013	7.60	7.40	7.20	6.80
10/28/2013	7.40	7.14	7.20	6.80
10/29/2013	7.80	7.30	7.30	6.70
10/30/2013	7.50	7.10	7.30	6.80
10/31/2013	7.50	6.90	7.30	6.70
11/1/2013	7.90	7.40	7.10	6.70
11/2/2013	8.20	7.40	7.40	6.90
11/3/2013	8.20	7.30	7.60	6.90
11/4/2013	8.00	7.40	7.20	6.80
11/5/2013	7.90	7.50	7.30	6.90
11/6/2013	7.90	7.40	7.30	6.90
11/7/2013	8.00	7.30	7.20	6.80
11/8/2013	8.30	7.70	7.50	7.00
11/9/2013	8.20	7.60	7.40	6.90
11/10/2013	8.30	7.70	7.50	6.80
11/11/2013	8.20	8.10	7.40	7.00
11/12/2013	7.90	7.90	7.40	6.70
11/13/2013	8.10	7.70	7.60	7.00
11/14/2013	8.00	8.20	7.50	6.80
11/15/2013	7.90	7.60	7.50	6.90
11/16/2013	7.70	7.10	7.50	6.90
11/17/2013	7.80	7.30	7.60	6.80
11/18/2013	7.90	7.60	7.50	6.80
11/19/2013	8.40	7.70	7.60	6.90
11/20/2013	8.30	7.80	7.40	6.90

Pepper's Ferry RWTA
pH Data - 90th Percentile Development

Date	RAAP WTP Maximum RAW pH	NRV Reg. Water Authority Maximum RAW pH	RAAP WTP Minimum RAW pH	NRV Reg. Water Authority Minimum RAW pH
11/21/2013	8.30	7.80	7.70	7.00
11/22/2013	8.40	7.80	7.80	7.00
11/23/2013	8.00	8.00	7.60	7.00
11/24/2013	8.10	8.00	7.40	7.20
11/25/2013	7.90	7.80	7.40	7.10
11/26/2013	7.40	7.20	7.30	7.00
11/27/2013	7.40	7.20	7.30	7.00
11/28/2013	7.50	7.20	7.30	7.10
11/29/2013	7.50	7.30	7.20	7.00
11/30/2013	7.60	7.40	7.50	7.10
12/1/2013	7.80	7.30	7.50	7.10
12/2/2013	7.70	7.60	7.30	7.10
12/3/2013	7.80	7.30	7.20	7.10
12/4/2013	8.20	7.40	7.30	7.10
12/5/2013	7.80	7.20	7.30	6.90
12/6/2013	7.80	7.20	7.20	6.90
12/7/2013	7.90	7.30	7.50	7.00
12/8/2013	7.80	7.50	7.50	7.00
12/9/2013	7.90	7.10	7.50	7.00
12/10/2013	7.80	7.10	7.30	7.00
12/11/2013	7.50	7.30	7.30	7.10
12/12/2013	7.80	7.40	7.40	7.10
12/13/2013	7.60	7.40	7.40	7.10
12/14/2013	7.60	7.20	7.40	7.10
12/15/2013	7.60	7.30	7.40	7.10
12/16/2013	7.80	7.50	7.40	7.10
12/17/2013	7.80	7.50	7.60	7.10
12/18/2013	8.10	7.50	7.50	7.20
12/19/2013	7.90	7.50	7.20	7.10
12/20/2013	7.70	7.40	7.30	7.10
12/21/2013	7.60	7.40	7.40	7.00
12/22/2013	7.40	7.30	7.20	7.10
12/23/2013	7.40	7.30	7.20	7.10
12/24/2013	7.50	7.20	7.30	7.00
12/25/2013	7.50	7.20	7.40	7.00
12/26/2013	7.60	7.30	7.40	7.00
12/27/2013	7.50	7.20	7.40	7.10
12/28/2013	7.50	7.20	7.40	7.00
12/29/2013	7.70	7.20	7.30	6.70
12/30/2013	8.10	7.10	7.60	7.00
12/31/2013	7.60	7.20	7.30	7.00
1/1/2014	7.40	7.30	7.30	7.00
1/2/2014	7.50	7.20	7.30	7.10
1/3/2014	7.50	7.30	7.40	7.10
1/4/2014	7.50	7.30	7.30	7.00
1/5/2014	7.50	7.30	7.30	7.20
1/6/2014	7.50	7.40	7.30	7.10
1/7/2014	7.50	7.30	7.30	7.10
1/8/2014	7.60	7.70	7.40	7.20
1/9/2014	7.60	7.40	7.40	7.10
1/10/2014	7.50	7.40	7.50	7.20
1/11/2014	7.60	7.30	7.30	7.10
1/12/2014	7.60	7.20	7.40	7.10
1/13/2014	7.50	7.20	7.40	7.20

Pepper's Ferry RWTA
pH Data - 90th Percentile Development

Date	RAAP WTP Maximum RAW pH	NRV Reg. Water Authority Maximum RAW pH	RAAP WTP Minimum RAW pH	NRV Reg. Water Authority Minimum RAW pH
1/14/2014	7.60	7.40	7.20	7.10
1/15/2014	7.90	7.30	7.30	7.20
1/16/2014	7.50	7.40	7.30	7.20
1/17/2014	7.70	7.40	7.40	7.10
1/18/2014	7.70	7.40	7.50	7.20
1/19/2014	7.60	7.40	7.40	7.20
1/20/2014	7.60	7.40	7.40	7.20
1/21/2014	7.60	7.40	7.40	7.20
1/22/2014	7.60	7.40	7.40	7.20
1/23/2014	7.50	7.50	7.40	7.20
1/24/2014	7.70	7.50	7.50	7.30
1/25/2014	7.50	7.50	7.50	7.20
1/26/2014	7.70	7.50	7.50	7.30
1/27/2014	7.80	7.60	7.50	7.30
1/28/2014	7.70	7.50	7.50	7.30
1/29/2014	7.90	7.40	7.20	7.20
1/30/2014	7.50	7.50	7.30	7.20
1/31/2014	7.80	7.50	7.40	7.10
2/1/2014	7.50	7.50	7.30	7.20
2/2/2014	7.40	7.40	7.30	7.20
2/3/2014	7.80	7.80	7.30	7.10
2/4/2014	7.60	7.50	7.10	7.20
2/5/2014	7.80	7.40	7.40	7.10
2/6/2014	7.70	7.50	7.40	7.20
2/7/2014	7.60	7.60	7.50	7.10
2/8/2014	7.60	7.50	7.50	7.10
2/9/2014	7.50	7.40	7.50	7.20
2/10/2014	8.00	7.50	7.40	7.20
2/11/2014	7.60	7.60	7.40	7.20
2/12/2014	7.60	7.60	7.50	7.10
2/13/2014	7.60	7.40	7.50	7.20
2/14/2014	7.50	7.70	7.20	7.10
2/15/2014	7.50	7.60	7.40	7.20
2/16/2014	7.60	7.70	7.30	7.20
2/17/2014	7.60	7.70	7.40	7.20
2/18/2014	7.60	7.90	7.50	7.10
2/19/2014	7.80	7.80	7.60	7.10
2/20/2014	7.70	7.50	7.40	7.10
2/21/2014	7.70	7.30	7.40	7.10
2/22/2014	7.60	7.20	7.40	7.00
2/23/2014	7.60	7.30	7.20	7.10
2/24/2014	7.70	7.30	7.30	7.20
2/25/2014	7.50	7.40	7.30	7.20
2/26/2014	7.70	7.40	7.40	7.20
2/27/2014	7.70	7.60	7.50	7.20
2/28/2014	7.90	7.60	7.30	7.10
3/1/2014	7.50	7.40	7.30	7.20
3/2/2014	7.50	7.40	7.30	7.10
3/3/2014	7.60	7.30	7.20	7.10
3/4/2014	7.70	7.40	7.40	7.10
3/5/2014	7.80	7.50	7.40	7.10
3/6/2014	7.70	7.30	7.30	7.10
3/7/2014	7.50	7.30	7.40	6.90
3/8/2014	7.70	7.40	7.50	7.10

Pepper's Ferry RWTA
pH Data - 90th Percentile Development

Date	RAAP WTP Maximum RAW pH	NRV Reg. Water Authority Maximum RAW pH	RAAP WTP Minimum RAW pH	NRV Reg. Water Authority Minimum RAW pH
3/9/2014	7.60	7.50	7.40	7.00
3/10/2014	7.60	7.50	7.50	7.00
3/11/2014	7.70	7.50	7.50	7.00
3/12/2014	7.60	7.60	7.30	7.10
3/13/2014	7.70	7.40	7.50	7.10
3/14/2014	7.60	7.70	7.50	7.10
3/15/2014	7.70	7.70	7.40	7.00
3/16/2014	7.70	7.70	7.50	7.00
3/17/2014	7.50	7.30	7.50	7.10
3/18/2014	7.60	7.50	7.40	7.10
3/19/2014	7.80	7.50	7.60	7.10
3/20/2014	7.90	7.70	7.60	7.10
3/21/2014	8.00	7.70	7.60	7.10
3/22/2014	7.90	8.80	7.60	7.10
3/23/2014	7.80	7.80	7.50	7.10
3/24/2014	7.80	7.60	7.50	7.10
3/25/2014	7.70	7.60	7.50	7.10
3/26/2014	7.70	8.00	7.60	7.20
3/27/2014	7.60	7.80	7.50	7.20
3/28/2014	7.70	7.70	7.40	7.00
3/29/2014	7.60	7.50	7.50	7.10
3/30/2014	7.80	7.60	7.50	7.20
3/31/2014	7.90	7.60	7.60	7.20
4/1/2014	7.90	7.60	7.50	7.10
4/2/2014	7.90	7.70	7.60	7.10
4/3/2014	7.90	7.70	7.40	7.10
4/4/2014	7.80	7.40	7.50	7.00
4/5/2014	7.90	7.70	7.50	7.10
4/6/2014	7.80	7.50	7.60	7.10
4/7/2014	7.70	7.50	7.40	7.10
4/8/2014	7.60	7.40	7.50	7.10
4/9/2014	7.60	7.40	7.40	7.10
4/10/2014	7.70	7.40	7.40	7.00
4/11/2014	7.60	7.40	7.40	6.90
4/12/2014	7.90	7.40	7.50	7.00
4/13/2014	7.80	7.40	7.60	7.00
4/14/2014	7.60	7.30	7.50	7.00
4/15/2014	7.60	7.30	7.40	7.00
4/16/2014	7.80	7.40	7.50	7.00
4/17/2014	7.80	7.30	7.60	7.00
4/18/2014	7.70	7.30	7.40	6.90
4/19/2014	7.70	7.60	7.60	7.00
4/20/2014	7.70	7.40	7.60	7.00
4/21/2014	7.90	7.40	7.60	7.00
4/22/2014	7.90	7.30	7.70	6.90
4/23/2014	7.80	7.40	7.40	6.90
4/24/2014	7.60	7.40	7.40	6.90
4/25/2014	7.60	7.60	7.30	6.90
4/26/2014	7.70	7.40	7.40	7.00
4/27/2014	7.70	7.40	7.40	6.90
4/28/2014	7.70	7.20	7.40	6.90
4/29/2014	7.70	7.40	7.50	6.90
4/30/2014	7.70	7.00	7.50	6.90
5/1/2014	7.70	7.40	7.40	6.90

Pepper's Ferry RWTA
pH Data - 90th Percentile Development

Date	RAAP WTP Maximum RAW pH	NRV Reg. Water Authority Maximum RAW pH	RAAP WTP Minimum RAW pH	NRV Reg. Water Authority Minimum RAW pH
5/2/2014	7.60	7.30	7.40	6.90
5/3/2014	7.60	7.20	7.40	6.90
5/4/2014	7.60	7.30	7.30	6.90
5/5/2014	7.60	7.30	7.40	6.90
5/6/2014	7.80	7.40	7.30	6.90
5/7/2014	7.90	7.40	7.50	6.90
5/8/2014	8.00	7.50	7.50	6.90
5/9/2014	7.70	7.30	7.30	6.90
5/10/2014	7.50	7.10	7.30	6.80
5/11/2014	7.80	7.40	7.30	6.80
5/12/2014	7.80	7.40	7.40	6.80
5/13/2014	7.80	7.40	7.20	6.80
5/14/2014	7.70	7.50	7.20	6.80
5/15/2014	7.40	7.00	7.20	6.80
5/16/2014	7.40	7.00	7.20	6.80
5/17/2014	7.30	7.00	7.10	6.60
5/18/2014	7.40	7.20	7.10	6.80
5/19/2014	7.50	7.20	7.10	6.70
5/20/2014	7.30	7.20	7.00	6.80
5/21/2014	7.40	7.30	7.10	6.80
5/22/2014	7.40	7.50	7.10	6.70
5/23/2014	7.50	7.40	7.20	6.70
5/24/2014	7.60	7.30	7.20	6.80
5/25/2014	7.60	7.30	7.10	6.70
5/26/2014	7.80	7.40	7.10	6.70
5/27/2014	7.70	7.30	7.00	6.70
5/28/2014	7.90	7.50	7.20	6.80
5/29/2014	7.50	7.30	7.20	6.40
5/30/2014	7.70	7.40	7.10	6.70
5/31/2014	7.60	7.30	7.10	6.70
6/1/2014	7.50		7.10	
6/2/2014	7.70		7.10	
6/3/2014	7.40		7.10	
6/4/2014	7.60		7.10	
6/5/2014	7.50		7.10	
6/6/2014	7.50		7.10	
6/7/2014	7.60		7.20	
6/8/2014	7.50		7.20	
6/9/2014	7.80		7.30	
6/10/2014	7.60		7.20	
6/11/2014	7.60		7.00	
6/12/2014	7.40		7.10	
6/13/2014	7.60		7.10	
6/14/2014	7.90		7.10	
6/15/2014	7.80		7.20	
6/16/2014	7.90		7.10	
6/17/2014	7.50		7.20	
6/18/2014	7.60		7.20	
6/19/2014	7.80		7.20	
6/20/2014	7.90		7.30	
6/21/2014	7.90		7.20	
6/22/2014	7.80		7.10	
6/23/2014	7.90		7.20	
6/24/2014	7.90		7.10	

Pepper's Ferry RWTA
pH Data - 90th Percentile Development

Date	RAAP WTP Maximum RAW pH	NRV Reg. Water Authority Maximum RAW pH	RAAP WTP Minimum RAW pH	NRV Reg. Water Authority Minimum RAW pH
6/25/2014	7.80		7.20	
6/26/2014	7.60		7.20	

EXHIBIT B

Pepper's Ferry 2014 Permit Renewal-Land Application Requirements:

NOTIFICATIONS

- Part III B. 1. Monthly reports to be submitted to BRRO…Lynchburg or Roanoke?
- Part III B. 3. Annual Report to be submitted to BRRO…Lynchburg or Roanoke?
- Part III D. 2. NMP is to be submitted to BRRO…Lynchburg or Roanoke?
- Part III D. 3. Biosolids (Sludge) Management Plan O & M Manual to be submitted to DEQ…Roanoke or Lynchburg?
- Part III E. 2. 14 Day written notification to be delivered to DEQ…Lynchburg or Roanoke?
- Part III E. 3. d. Signs to contain the following information: *Contact information for DEQ*…Lynchburg or Roanoke?
- Part III E. 5. 24 hour notification: Permitee shall notify DEQ in writing 24 hours prior to commencing land application activities…Lynchburg or Roanoke?

From: Clarke Wallcraft [mailto:cwallcraft@jetbroadband.com]
Sent: Wednesday, July 09, 2014 3:42 PM
To: Tate, Robert (DEQ)
Cc: Foster, Kip (DEQ); Wise, Lynn (DEQ); 'Mac McCutchan'; 'Robbie Graham'; 'Mike Hutchison'
Subject: July 8th Meeting Follow-up

Bob:

Thank you again for the opportunity to meet with DEQ staff yesterday to discuss the Authority's comments related to the proposed draft VPDES permit currently in the public comment phase. Please consider this as follow-up comments on those discussions.

PCB TMDL Issues – The Authority maintains its objection to the use of EPA Method 1668 for monitoring and analysis, in that we believe it is disallowed by 40 CFR Part 136. Further, the Authority maintains its objection to Part I, B. 11 of the draft permit in its entirety, to include any future PMP requirement and WLA reference, and therefore request the entire section be removed from the permit. The Authority is also committed to obtain the one remaining wet weather sample, and to submit monitoring analysis for that sample and one other wet weather sample for which results are currently being developed; however, the Authority continues to object to the use of EPA Method 1668 related to these wet weather samples. With specific regard to the PMP requirement, the potential costs associated with this requirement could be astounding. Furthermore, the draft permit indicates the PMP must be designed to locate and reduce sources of PCBs in the collection system. The Authority owns no collection system, and questions the legality of having to develop a PMP for facilities that it does not own or operate, and commit to the associated costs, again, for facilities that the Authority does not own. Lastly, to specifically call out a TMDL for PCBs is not necessary, as there is already a reopener clause for <u>any TMDL</u> in Part I, B. 9.

Ammonia Limit – 18.0 MGD Tier – Although the Authority has provided data we believe is more representative of the 90th percentile value for pH, for use by DEQ in recalculating for RP regarding an ammonia limit at 18.0 MGD, the Authority will withdraw this request based on the fact it is extremely unlikely the 18.0 MGD tier will be triggered in the permit cycle beginning October 2014; however, the Authority will continue to collect pH, hardness and temperature data from the river and will submit that information for use by the DEQ for the permit cycle that would begin in October 2019. In the event that the permit is reopened prior to October 2019 for ammonia, the Authority proposes to provide the DEQ with pH, hardness and temperature data at that point for use in determining the 90th percentile value and calculation of any proposed ammonia limit at either 9.0 MGD or 18.0 MGD.

WET Program 9.0 MGD – Thank you for your explanation regarding the change from 7.14 tu to 6.66 tu.

Biosolids Issues – Prior to the issuance date of the permit, DEQ and the Authority will determine what aspects of the requirements in Part III (Biosolids) of the permit will occur with BRRO-Roanoke, and what requirements will occur with BRRO-Lynchburg. An attachment to the permit will clearly delineate which BRRO will be the direct contact for which portion of the permit as it relates to biosolids.

Fact Sheet – Special Condition Table – No resolution was reached regarding the language in question. Clarification should be made prior to finalization of the permit. The Authority believes the "DOC" reference is specific to a Department of Corrections facility that uses a contract land applicator holding a VPA permit, and that this reference should be removed from the Fact Sheet, as it does not pertain to the Authority.

I believe this about covers it. Again, we really appreciate the time to meet with you. We look forward to receiving additional information from you regarding our submitted comments dated July 8th, 2014, and regarding our concerns discussed in our meeting on July t8th, and further outlined herein. Thank you.

Clarke

R. Clarke Wallcraft
Executive Director

COMMONWEALTH of VIRGINIA

David K. Paylor
Director

Molly Joseph Ward
Secretary of Natural Resources

DEPARTMENT OF ENVIRONMENTAL QUALITY
Blue Ridge Regional Office
www.deq.virginia.gov

Robert J. Weld
Regional Director

Lynchburg Office
7705 Timberlake Road
Lynchburg, Virginia 24502
(434) 582-5120
Fax (434) 582-5125

Roanoke Office
3019 Peters Creek Road
Roanoke, Virginia 24019
(540) 562-6700
Fax (540) 562-6725

July 17, 2014

forwarded via e-mail (cwallcraft@jetbroadband.com) to R. Clarke Wallcraft, Executive Director, Pepper's Ferry Regional Wastewater Treatment Authority

RE: Reissuance of VPDES Permit VA0062685 – DEQ Responses to Permittee Comments on Draft Permit

Dear Mr. Wallcraft:

This letter contains responses to comments received by the Virginia Department of Environmental Quality's Blue Ridge Regional Office (DEQ) concerning draft VPDES Permit VA0062685. Initial comments were received in a letter dated July 8, 2013. After a meeting with the permittee's representatives (permittee) and DEQ representatives that afternoon, subsequent comments were received in a July 9 e-mail message. DEQ's responses are in the order of comments in the July 8 letter.

1. Part I.B.11. PCB Monitoring for Total Maximum Daily Load (TMDL) Development

   The July 7 letter and the July 8 e-mail object to Part I.B.11 in total and in part. DEQ had four phone conversations concerning the draft permit with EPA's Mark Smith. Conversations originated around June 10 and concluded July 15. EPA was aware of the chain of events concerning wet-weather PCB monitoring and the original intent to leave wet-weather PCB monitoring requirements out of the permit. After reviewing the draft permit, EPA indicated that a PCB monitoring condition was needed. Part I.B.11 was added to the draft permit, which was forwarded to the permittee for review. After hearing the permittee's concerns in the July 8 meeting about Part I.B.11, Part I.B.11 was revised and forwarded to the permittee and to EPA for further review. EPA requested the condition (as revised) remain in the permit.

   Method 1668 is an acceptable monitoring method. DEQ TMDL Guidance Memo No. 09-2001 (March 6, 2009) and Amendment No. 1 (November 1, 2011) specify use of Method 1668. Current VPDES Permit VA0062685 Part II.A.2 and draft VPDES Permit Part II.A.1.a both allow use of other methods of analysis specified in a permit.

EPA supported the permittee's contention that a pollutant minimization plan (PMP) could not be required before a TMDL is approved. Part I.B.11 was revised to hopefully address the concern. In a phone conversation July 15, DEQ conveyed to EPA the permittee's concerns about a PMP for a facility that does not own the collection system. The Authority is made up of members from the local jurisdictions that own the collection system and because of this relationship the Authority can plan, organize, and implement a coordinated effort to identify and minimize sources of this pollutant prior to discharge from the Authority's outfall. EPA and DEQ share the opinion that the permittee is ultimately responsible for discharges, regardless of collection system ownership. It is the opinion of EPA and DEQ that a PMP is a better approach than immediate establishment of a PCB limit.

Although the draft permit contains the standard TMDL reopener condition (Part I.B.9), that is insufficient reason to remove Part I.B.11. Repeating from above, EPA requested the condition (as revised) remain in the permit.

2. Part I.A.2. Limitation and Monitoring Requirements – Ammonia-N Jun-Dec (18.0 MGD Tier)

As discussed in the July 8 meeting, the stream pH data used to determine ammonia limits (and evaluate other parameters) are irrelevant to any future ammonia criteria or ammonia limits in future permits. If the Department adopts new ammonia criteria, appropriate stream pH data will be used to evaluate reasonable potential of ammonia and other toxic parameters. (It is highly unlikely that the permit will be reopened before anticipated expiration September 30, 2019.) In the July 9 e-mail message, the permittee withdrew its request for an alternative pH data set for the proposed permit. The permittee will continue to collect stream pH data and will also collect hardness and temperature stream data. DEQ requests that appropriate pH data be accompanied by corresponding temperature and hardness data from the same monitoring location.

Of less importance, pH data were obtained from the same monitoring location as for previous reissuances of VPDES Permit VA0062685. The 2009 reissuance used 88 data points spanning 120 months. The 2014 reissuance used 63 data points spanning 119 months. The resulting pH statistics were remarkably consistent.

3. Part I.D.1.b. Whole Effluent Toxicity Program (9.0 MGD Tier)

As discussed and demonstrated in the July 8 meeting, the permit writer used an incorrect mixing value to evaluate whole effluent toxicity for permit reissuance in 2009. A mixing value of 3.1% was used for the acute condition, resulting in an NOEC of greater than or equal to15% (TUc less than or equal to 6.66). The correct mixing value for the acute condition (low flow 1Q10) was 2.67%. The 3.1% mix was for high flow 1Q10 mixing, inappropriate for toxicity evaluation. Acute condition calculations in 2014 used the correct mixing value (2.67%), resulting in a NOEC of greater than or equal to14% (TUc less than or equal to 7.14). All mixing values were the same as in the 2009 permit reissuance.

4. Part III Biosolids

The draft biosolids component was deliberately forwarded in rough form. The primary intention was to get the draft permit to the permittee as soon as possible. Formatting would have taken more time. The rough form would also allow easier comparison with templates previously forwarded to the permittee. The permit writer did anticipate that more revisions could be handed down from DEQ's Office of Land Application, (OLAP). Part III as forwarded to the permittee had undergone many revisions as a result of OLAP changes to templates.

It should not be surprising that permit language would reflect the biosolids regulations. DEQ agrees that the sequencing of the various conditions could be improved.

Submittal notifications were purposely directed to "DEQ's Blue Ridge Regional Office" rather than the Lynchburg or Roanoke branch offices. The permit writer felt this gave the most flexibility to the permittee; the permittee would fulfill submittal requirements as long as required documents were received by either branch office. The permit writer has since been enlightened by both permittee and regional office's water compliance section. Rather than specify branch offices within the permit, the regional office thinks it better to add a list of "submittal sites" in an attachment to the permit transmittal letter. Any future changes in submittal procedures can made with written communication, thus avoiding need for permit modification (changing instructions in the permit). Exhibit B was forwarded to the regional office's water compliance manager for his determinations as to where specific submittals should be forwarded.

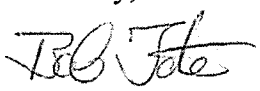
The permit writer confesses that he only recently realized the need for DEQ biosolids control identification numbers in the proposed permit (Part III.E.4.b and Part III Attachment A). With the permittee's assistance, control numbers will be generated by biosolids personnel in the Lynchburg branch office.

5. Fact Sheet Item 17 – Bases for Sludge Use & Disposal Requirements

DEQ agrees the language in red font at the bottom of page 16 should be removed from the fact sheet.

If you have any further questions or concerns, please contact me at bob.tate@deq.virginia.gov or at (540) 562-6774.

Sincerely,



Robert S. Tate
Water Permit Writer

Pepper's Ferry Regional Wastewater Treatment Authority
P. O. Box 2950 - Radford, VA 24143-2950
Phone: 540-639-3947 Fax: 540-633-0215

July 18, 2014

By Hand Delivery & Email

David K. Paylor, Director
Department of Environmental Quality
Commonwealth of Virginia
629 East Main Street
Richmond, Virginia 23219

Re: VPDES Permit No. VA0062685
Request for Public Hearing

Dear Director Paylor:

Please accept the following as Pepper's Ferry Regional Wastewater Treatment Authority's Request for Public Hearing on the proposed reissuance of the subject VPDES permit. Although we appreciate the efforts of the Blue Ridge Regional Office in processing the reissuance and attempting to work with the Authority, there are serious unresolved permit issues that merit a Public Hearing and full consideration by the State Water Control Board.

As an initial matter, we note that much of the Regional Office's basis for the PCB-related conditions to which we object is based on requests and statements from EPA Region III staff as to what they believe should be included in the permit. This basis appears repeatedly in email correspondence and in the Department's response to our comments of July 17. We respectfully submit that this is a Virginia permit and it is the Department's responsibility to determine independently the legal and appropriate permit conditions. The procedure employed by the DEQ Regional Office and EPA attempts to shift blame for the permit conditions and avoid either party having to address up front the consistency of those conditions with Virginia law, federal law (which the EPA commenter does not appear to address), and the concerns raised by the Authority.

The Permit Provisions at Issue

1. Part I.B.11 Analytical Method for PCBs

The draft provision would require the use of EPA's Method 1668 for analyses of PCB congeners. Analyses required by permit must be by EPA approved methods identified in 40 CFR Part 136. 40 CFR § 136.1 (incorporated in the VPDES Regulation). Method 1668 is a developmental or experimental EPA method not listed in Part 136. The Regional Office's July 17 response that Method 1668 is "acceptable" and its references to DEQ guidance referring to

the Method for TMDL development (but not VPDES) purposes does not cure the legal requirement noted above. Even if the guidance addressed permitting (which it does not), guidance may not modify the Regulations.

Although the Authority has used and may use in the future Method 1668 selectively as an accommodation to the Department in its TMDL development program, it is unauthorized and inappropriate for the permit to purport to require its use for any mandatory permit purposes or at the instruction of the Department.

We request (as we have in comments to Blue Ridge) that the permit delete any reference to Method 1668.

2. Part I.B.11 PCB PMP Requirements

The draft provisions would also require that the Authority develop and implement a PCB Pollutant Minimization Plan (PMP) in response to certain findings that are dependent on a PCB TMDL, TMDL wasteload allocations (WLA) and/or TMDL Implementation Plans that may be developed in the future. This provision fails to give the Authority the required notice of the requirements imposed on it. The essence of the Administrative Process Act requirements for permits and other case decisions, and of due process, is reasonable notice of the requirements imposed. Va Code § 2.2-4019. Although a PCB TMDL for the New River is currently under development, prior to its development and finalization there is no way that the Authority can adequately comment on or address the need for a PMP, the substance of a possible PMP, or alternatives to the PMP approach.

In the Department's recent reissuance of the General VPDES Permit for Discharges of Storm Water Associated with Industrial Activity, 9 VAC 25-151, the Department and the State Water Control Board considered the same legal issue. The draft General Permit had similarly provided that permittees would be required to develop and implement PMPs based on the results and WLAs of TMDLs to be developed and finalized in the future. The final General Permit correctly deleted those provisions, after consideration of the legal issue by the Department.

We submit that one of the reasons for the relatively short five-year permit term is to allow the Department frequent opportunities to include in permits new and additional requirements based on new factors since the prior issuance. Moreover, the standard permit reopener is designed specifically for this purpose. It allows the Department to reopen and modify a permit during its term for any proper TMDL purpose. The reopener process provides the required notice and opportunity to properly comment for the permittee and the public.

Also, the Authority objects to the PMP requirement because a PMP necessarily requires control and authority over the collection system, the source of any PCBs in the influent. The Authority neither owns nor controls the collection system, making the proper development and implementation of a PMP impossible.

We request (as we have in comments to Blue Ridge) that the permit delete any reference to a PCB PMP requirement.

The Basis for Pepper's Ferry's Request for Public Hearing

The Authority provides the following pursuant to VA Code § 62.1-44.15.2.B.

1. The name, address and telephone number of the requestor, Pepper's Ferry Regional Wastewater Treatment Authority, are included above.

2. The Authority is acting herein as a representative of its rate payers (in addition to acting for itself). Otherwise, the Authority is acting as the representative for no other person.

3. The Authority requests the public hearing because of what we conclude to be the inappropriateness and illegality of the provisions challenged, and because implementation of the challenged provisions will adversely impact the Authority and its rate payers, without the Authority having the required notice of requirements to be imposed and without thereby the ability to adequately comment, respond or plan.

   At the public hearing the Authority will address the inaccuracy and other issues with Method 1668 that caused EPA in 2011 to withdraw the Method for consideration for inclusion in Part 136 (EPA's then proposed Part 136 Method Update Rule); and the costs and other adverse impacts on the Authority from any required use of the Method. The Authority will demonstrate that the Method (although it may be appropriate for Department use in a developmental effort utilizing a large averaged data base such as TMDL development) does not currently have the accuracy needed for determinations of PCB concentrations at specific times from specific sources, illustrating EPA's 2011 withdrawal from Part 136 consideration.

   The Authority will also at the public hearing address (a) the costs and other impacts of the possible development and implementation of a PCB PMP and (b) alternatives to a PMP; and the difficulty of evaluating these in the absence of any information concerning (x) the substance of any possible future TMDL or (y) the manner in which the TMDL, TMDL WLAs or any TMDL Implementation Plan may address the possible discharge of PCBs from this point source. Neither the Department nor the Authority knows anything of substance now about a possible future New River TMDL or its approach to possible POTW point sources. The absence of knowledge prevents the Authority from proposing that the permit include any potential alternatives to the PMP approach. This illustrates the practical reason (in addition to the Va Code requirement) that agency case decisions should provide an adequate basis for the affected party to know the requirements to be imposed on it. At the time that there is a final TMDL, the Authority will be able to evaluate any proposed POTW response.

   The Authority will further address the ownership and O&M responsibilities of the collection system, and its lack of authority thereby.

4. The interest of the Authority and its rate payers in the identified permit conditions and the extent that such interest is affected by the permit proposal are addressed above.

5. The conditions of the permit in question and our specific requests are addressed above.

Accordingly, in accordance with the Code section cited above and the Department's Regulations, we request that the Department convene the Public Hearing. We appreciate the Department's continuing assistance in this matter. Please direct any questions concerning the request for public hearing to Richard H. Sedgley, esq. (804-716-9021 or dick@aqualaw.com).

Sincerely,

R. Clarke Wallcraft

R. Clarke Wallcraft
Executive Director

Copy: Robert Weld, BRRO Director
PFRWTA Board
Richard H. Sedgley, esq.

COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY
Street address: 629 East Main Street, Richmond, Virginia 23219
Mailing address: P.O. Box 1105, Richmond, Virginia 23218
Fax: 804-698-4019 - TDD (804) 698-4021
www.deq.virginia.gov

Molly Joseph Ward
Secretary of Natural Resources

David K. Paylor
Director

(804) 698-4020
1-800-592-5482

August 14, 2014

Mr. R. Clarke Wallcraft
Executive Director
Pepper's Ferry Regional Wastewater Treatment Authority
P. O. Box 2950
Radford, VA 24143-2950

Re: VPDES Permit No. VA0062685
Request for Public Hearing

Dear Mr. Wallcraft:

I am responding to your letter of July 18, 2014, in which you requested a public hearing over issues contained in the draft VPDES permit (VA0062685) for the Pepper's Ferry Regional Wastewater Treatment Plant. Staff from both our Central and Blue Ridge Regional Offices has reviewed the concerns you identified as they relate to internal agency guidance as well as pertinent regulations. As a result of these discussions, the agency has modified its position on certain permit conditions contained in the draft permit. I will address the issues in the order they were presented in your letter.

1. Part I.B.11 Analytical Method for Polychlorinated Biphenyl's (PCB's)

It is our understanding that the Authority has collected two additional wet weather samples; and the analysis, in accordance with EPA Method 1668, is currently underway. If the Agency receives these analyses prior to September 15, 2014, and after Q/A Q/C review by staff, the results meet our needs for Total Maximum Daily Load (TMDL) development, then paragraphs a., b., c., d. and f. of this special condition will be removed from the permit.

2. Part I.B.11 PCB Pollutant Minimization Plan (PMP) Requirements

The Pepper's Ferry facility discharges directly into the New River which is designated as an impaired stream segment for PCBs. The TMDL for PCBs on the New River is scheduled to be completed by July 2016. In light of the fact that the TMDL is not yet complete, paragraph e. of this special condition that speaks to the need for a PMP to be developed will be removed from the permit. If the results of the TMDL indicate further steps to control PCBs from the Pepper's

Ferry facility are warranted, the permit may be reopened in accordance with the Part I.B.9. Total Maximum Daily Load (TMDL) Reopener and include steps to address PCBs.

I hope that these modifications to the draft permit are acceptable and that you will withdraw your request for a public hearing on these matters. If you have any additional questions, please feel free to contact Robert Weld at 540-562-6870 or via email him at robert.weld@deq.virginia.gov.

Sincerely,

David K. Paylor

cc: Richard H. Sedgley, Esq.
Robert Weld. BRRO Regional Director

Pepper's Ferry Regional Wastewater Treatment Authority
P. O. Box 2950 • Radford, VA 24143-2950

August 19, 2014

David K. Paylor, Director
Department of Environmental Quality
Commonwealth of Virginia
629 East Main Street
Richmond, Virginia 23219

Re: VPDES Permit No. VA0062685
Public Hearing Request

Dear Director Paylor:

I am in receipt of your August 14, 2014 letter in response to the Pepper's Ferry Regional Wastewater Treatment Authority's (the "Authority") Request for Public Hearing on the proposed reissuance of the subject VPDES permit. Let me take this opportunity to thank you for your consideration of the Authority's request, and for the resulting modifications by the agency to certain conditions contained in Part I.B.11 of the draft permit. Considering the agency's action, as described in your letter, the Authority hereby withdraws its Request for a Public Hearing on this matter.

Sincerely,

R. Clarke Wallcraft

R. Clarke Wallcraft
Executive Director

Copy: Robert Weld, BRRO Director
PFRWTA Board
Richard H. Sedgley, esq.

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