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Attachment A

Flow Frequency Memorandum

MEMORANDUM

VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY

WEST CENTRAL REGIONAL OFFICE

3019 Peters Creek Rd. Roanoke, VA 24019

SUBJECT: Flow Frequency Determination
Otter River Elementary School STP - #VA0020851

TO: Permit File

FROM: Kevin Harlow

DATE: May 15, 2008

The Otter River Elementary School STP discharges to an unnamed tributary of the Big Otter River near Goode, VA. Stream flow frequencies are required at this site by the permit writer for the purpose of calculating effluent limitations for the VPDES permit.

At the discharge point, the receiving stream is shown to be an intermittent on the USGS Goode Quadrangle topographic map. The flow frequencies for intermittent are 0.0 cfs for the 1Q10, 7Q10, 30Q5, high flow 1Q10, high flow 7Q10, harmonic mean, etc. Flow frequencies have been determined for the first perennial reach on the unnamed tributary downstream of the discharge point.

The USGS conducted several flow measurements on the Little Otter River from 1951 to 1954, in 1977, and from 1981 to 1985. The measurements were made at the Route 122 bridge near Bedford, VA. The measurements made by the USGS correlated very well with the same day daily mean values from the continuous record gage on the Big Otter River near Evington, VA #02061500. The measurements and daily mean values were plotted by the USGS on a logarithmic graph and a best fit line was drawn through the data points. The required flow frequencies from the reference gage were plotted on the regression line and the associated flow frequencies at the measurement site were determined from the graph.

The flow frequencies at the discharge point were determined by using the values at the measurement site and adjusting them by proportional drainage areas. The data for the reference gage, the measurement site and the discharge point are presented below:

Big Otter River near Evington, VA (#02061500):
Drainage Area = 320 mi^2

1Q10 = 18 cfs (12 MGD)	High Flow 1Q10 = 85 cfs (55 MGD)
7Q10 = 21 cfs (14 MGD)	High Flow 7Q10 = 98 cfs (63 MGD)
30Q5 = 48 cfs (31 MGD)	High Flow 30Q10 = 131 cfs (85 MGD)
30Q10=31 cfs (20 MGD)	Harmonic Mean = 132 cfs (85 MGD)
	Annual Average = 216 cfs (140 MGD)

Little Otter River at Rt. 122 near Bedford, VA (#02061200):
Drainage Area = 18.26 mi^2

1Q10 = 1.0 cfs (0.64 MGD)	High Flow 1Q10 = 4.5 cfs (2.9 MGD)
7Q10 = 1.1 cfs (0.74 MGD)	High Flow 7Q10 = 5.1 cfs (3.3 MGD)
30Q5 = 2.6 cfs (1.7 MGD)	High Flow 30Q10 = 6.8 cfs (4.4 MGD)
30Q10=1.7 cfs (1.1 MGD)	Harmonic Mean = 6.9 cfs (4.4 MGD)
	Annual Average = 11.1 cfs (7.2 MGD)

UT to Big Otter River at the perennial point:
Drainage Area = 0.23 mi^2

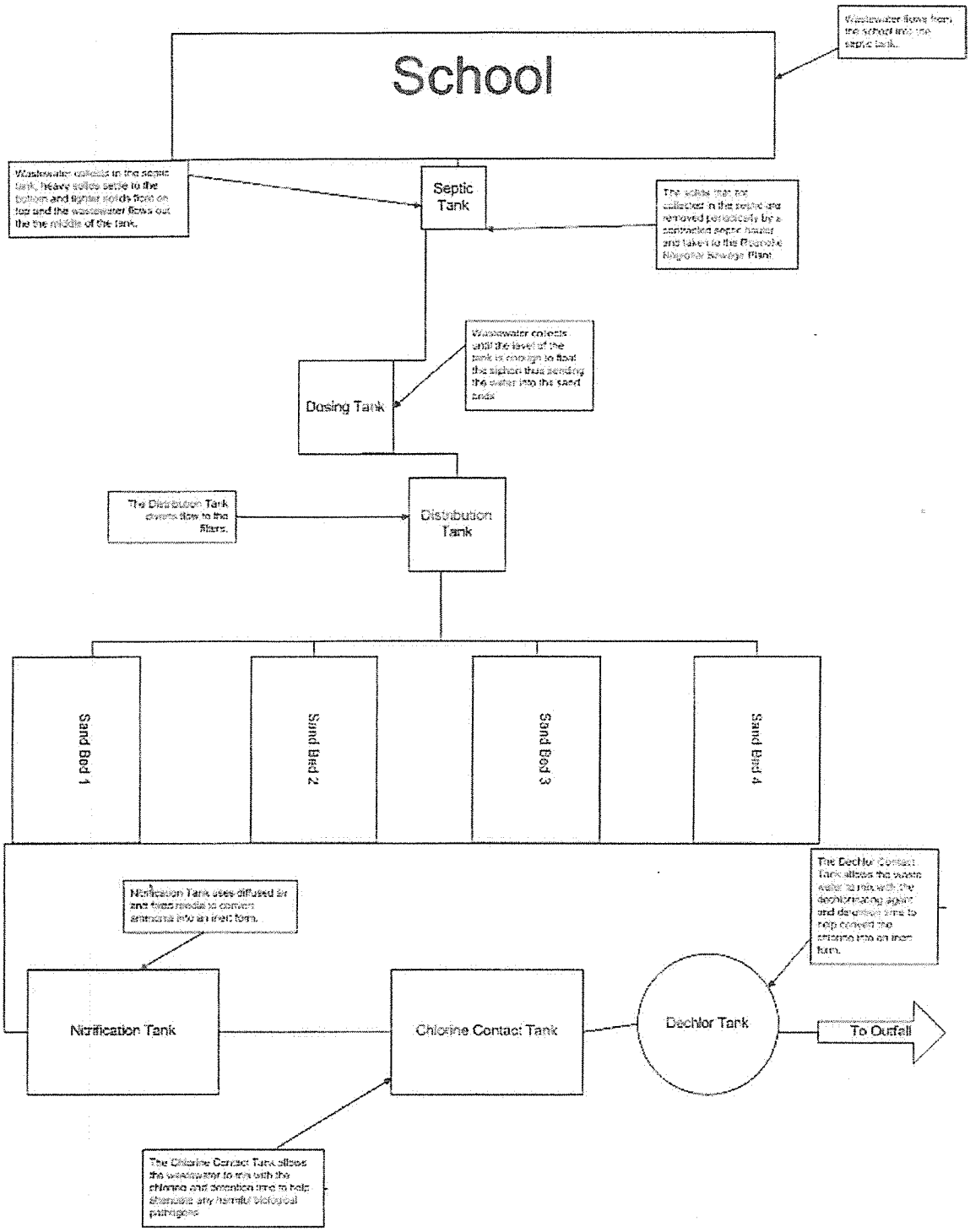
1Q10 = 0.012 cfs (0.0080 MGD)	High Flow 1Q10 = 0.056 cfs (0.036 MGD)
7Q10 = 0.014 cfs (0.0093 MGD)	High Flow 7Q10 = 0.065 cfs (0.042 MGD)
30Q5 = 0.032 cfs (0.021 MGD)	High Flow 30Q10 = 0.086 cfs (0.056 MGD)
30Q10=0.021 cfs (0.014 MGD)	Harmonic Mean = 0.087 cfs (0.056 MGD)
	Annual Average = 0.14 cfs (0.091 MGD)

The high flow months are January through May.

This analysis assumes there are no significant discharges, withdrawals or springs influencing the flows in the unnamed tributary upstream of the perennial point.

Attachment B

Wastewater Treatment Diagrams


School
Wastewater flows from the school into the septic tank.
Wastewater collects in the septic tank, heavy solids settle to the bottom and lighter solids float on top and the wastewater flows out the the middle of the tank.
Septic Tank
The solids that are collected in the septic are removed periodically by a contracted septic hauler and taken to the Roanoke Regional Sewage Plant
Wastewater collects until the level of the tank is enough to float the siphon thus sending the water into the sand beds
Dosing Tank
The Distribution Tank diverts flow to the filters.
Distribution Tank
Sand Bed 1
Sand Bed 2
Sand Bed 3
Sand Bed 4
Nitrification Tank uses diffused air and fixed media to convert ammonia into an inert form.
Nitrification Tank
Chlorine Contact Tank
Dechlor Tank
To Outfall
The Dechlor Contact Tank allows the waste water to mix with the dechlorinating agent and detention time to help convert the chlorine into an inert form.
The Chlorine Contact Tank allows the wastewater to mix with the chlorine and detention time to help eliminate any harmful biological pathogens

Attachment C

Site Visit Report

MEMORANDUM
VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY
WEST CENTRAL REGIONAL OFFICE
WATER DIVISION

3019 Peters Creek Road Roanoke, Virginia 24019-2738

SUBJECT: Site visit for VPDES Permit Reissuance - VA0020851
Otter River Elementary School WWTP

To: Permit files VPDES permit VA0020851

From: Kevin A. Harlow, Environmental Engineer Sr.

Date: February 8, 2008

On Monday, February 8, 2008, the writer performed a site visit at the Otter River Elementary School STP. Also present during the visit was Jennifer Mitchell with the Bedford County PSA.

The treatment facility consists of a grease trap, two septic tanks, dosing tank with dual alternating siphons, distribution box, four biological sand filter beds operating in parallel followed by a nitrification unit, chlorine contact tank, and tablet dechlorination.

No actual influent flow rates are available. DMR flow reporting is estimated based on the number of students. Septic tanks and grease traps are pumped as needed. The grease traps and septic tanks were not opened for inspection during this visit. The dosing siphon, sand filters, nitrification unit, and chlorination facilities were all fenced and the gate locked.

The chlorine and dechlorination material is stored in a locked storage room inside the fenced area. As noted above there was no discharge from the facility during our visit so no measurements were recorded from the visit. The discharge is through a PVC pipe to an unnamed tributary to Big Otter River. The receiving stream was a small defined channel feeding into a larger much deeper drainage way. In the pasture area immediately above the discharge point it could not be determined if there was any perennial flow.

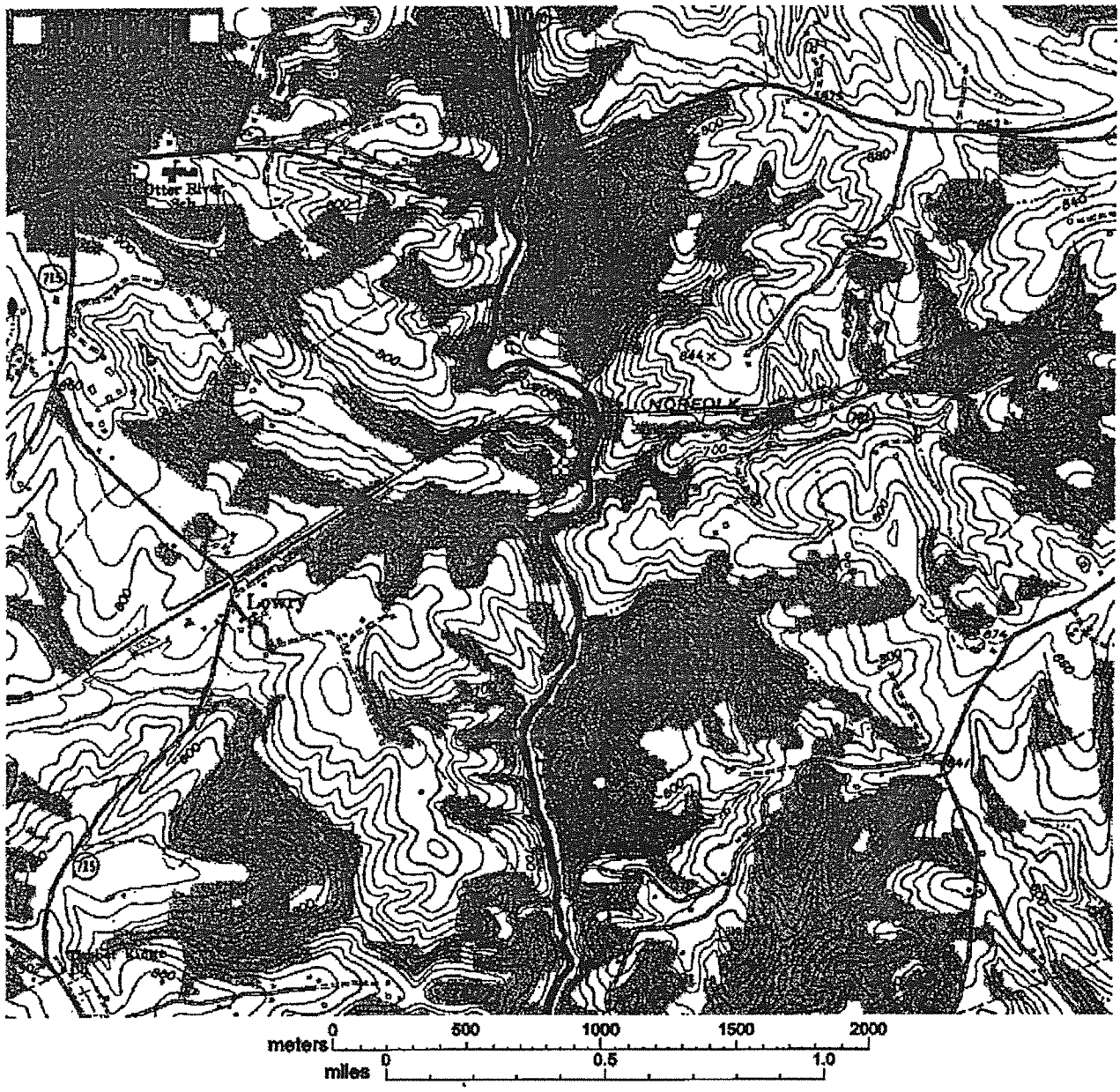
Test equipment is stored on the truck used by the operator to visit each facility daily. The Operations and Maintenance manual for the facility is maintained by the PSA. The operator was not asked about maintenance records during the visit.

Attachment D

USGS Topographic Map

TopoZone.com

Target is UTM 17 640085E 4135166N - **GOODE** quad [Quad Info]



The TopoZone is produced by Maps a la carte, Inc. - © 2000 Maps a la carte, Inc. - All rights reserved. Use of this site is governed by our Conditions and Terms of Use. We care about your privacy - please consult our Privacy Statement for details.

Attachment E

Ambient Water Quality Information

- 2010 Impaired Waters Report, L25R-01-BAC
- Big Otter River TMDL Addendum, Page 1
- Roanoke River Basin Water Quality Management Plan (excerpt)

2010 Impaired Waters

Categories 4 and 5 by DCR Watershed*

VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY

Roanoke and Yadkin River Basins

Fact Sheet prepared for DCR Watershed: L25*

Cause Group Code: **L25R-01-BAC** **Big Otter River, Elk Creek and North Otter Creek**

Location: Big Otter River from the mouth of North Otter Creek downstream to the confluence of the Little Otter River. Elk Creek from the Rt. 644 crossing at Perrowville downstream to the Elk Creek confluence on the Big Otter River. North Otter Creek from near the Rt. 122 crossing downstream to the its mouth on the Big Otter River.

Note: The original 1998 bacteria 7.28 mile impairment on Elk Creek is extended with the 2004 IR to include the lower portion of North Otter Creek and the Big Otter River.

City / County: Bedford Co.

Use(s): Recreation

Cause(s) /
VA Category: Escherichia coli/ 4A Fecal Coliform/ 4A

The Big Otter River / Elk Creek Bacteria Total Maximum Daily Load (TMDL) is U.S. EPA approved on 2/02/2001 [Fed. ID 1498/9595/18708/23401/36497] and SWCB approved on 6/17/2004 (formerly VAW-L25R-01). The Bacteria Implementation Plan (IP) received SWCB approval on 3/27/2007. The waters are therefore Category 4A for bacteria. The Bacteria TMDL encompasses the Little Otter drainage (L26R) including Machine Creek (L26R), Big Otter drainage (L23R, L24R, L27R, L28R- mainstem delisted 2008 13.98 mi.) including Sheeps (L23R), North Otter (L24R) and Elk (L25R) Creeks. Allocation scenario development is for the entire drainage to provide pollutant reductions for all watersheds contributing to the bacteria impairment. The entirety of the approved TMDL and allocations can be viewed at http://www.deq.virginia.gov. Ultimately escherichia coli (E.coli) replaces fecal coliform (FC) bacteria as the indicator as per Water Quality Standards [9 VAC 25-260-170. Bacteria; other waters].

The 2004 extension is the result of additional data collections made while conducting the TMDL Study. The bacteria impairment encompasses the original Elk Creek 7.28 miles and the total 2004 extension of 30.10 miles. The original 1998 and 2004 extensions totaling 37.38 miles are described below:

The 1998 Elk Creek (L25R) original 7.27 mile bacteria upper limit is at Rt. 622 west of Forest (Forest Quad 37°20'25" / 79°21'33") and ending at its mouth on the Big Otter River (Goode Quad 37°18'37" / 79°23'38"). The 2004 extension runs from near Perrowville (37°24'58" / 79°21'07") downstream to the Rt. 622 crossing adding 11.86 miles. The original 1998 and 2002 303(d) Listing basis is for fecal coliform bacteria (FC) exceedances at 4AECR003.02. These data show contravention of the former WQS 1000 cfu/100 ml fecal coliform criterion in greater than 25 percent of the samples collected.

Elk Creek (19.13 miles)
4AECR016.66- (Below Rt. 664 near Norwood) Six of nine escherichia coli (E.coli) samples exceed the 235 cfu/100 ml instantaneous criterion in both 2008 and 2010 assessments. The exceedance range is from 320 to 1600 cfu/100 ml.

4AECR007.42- (intersection of Routes 643 and 705) E.coli exceedances are found in six of nine samples with a range of exceedance from 320 cfu/100 ml to greater than 2000 in both 2008 and 2010 assessments. Each in excess of the instantaneous criterion.

4AECR003.02- (Rt. 668 Bridge) 2010 assessment results find eleven of 21 E.coli samples exceed the instantaneous criterion ranging from 300 to 1500 cfu/100 ml. The 2008 assessment found six of nine E.coli samples exceed the instantaneous criterion. The exceeding values range from 300 to greater than 2000 cfu/100 ml.

The 2004 North Otter Creek (L24R) extension is 6.55 miles. The extension includes the lower portion of North Otter Creek on the Sedalia Quad (37°27'12" / 79°27'55") from near the Route 122 crossing extending downstream to its mouth on the Big Otter River (Sedalia Quad (37°23'04" / 79°26'40").

4ANOT001.06- (Rt. 644 Bridge - Langford Mill Rd.) 2010 data find Escherichia coli (E.coli) exceed the 235 cfu/100 ml

Roanoke and Yadkin River Basins

Fact Sheet prepared for DCR Watershed: L25*

instantaneous criterion in two of 12 observations. Values in excess of the criterion are 300 cfu/100 ml each. There were no additional data beyond the 2006 Integrated Report (IR). Exceedances within the 2008 data window are four of 13 FC samples with the same range of exceedance as in 2006. The 2006 IR reports seven of 20 FC samples exceed the 400 cfu/100 ml instantaneous criterion. The range of exceedance is from 700 cfu/100 ml to greater than 8000. The 2004 IR reports 10 of 28 samples in excess of the instantaneous criterion for fecal coliform bacteria ranging from 500 cfu/100 ml to greater than 8000.

Big Otter River (L25R; 2004 extension of 11.70 miles.)
The Big Otter River (L25R) from the confluence of North Otter Creek (Sedalia Quad 37°27'12" / 79°27'55") river mile 32.01 downstream to the confluence of Little Otter River on the Big Otter River (Goode Quad 37°16'28" / 79°24'19") river mile 20.27.

4ABOR029.74- (Rt.221 Bridge intersection Rt.'s 221 & 670) There are no additional data beyond the 2004 assessment. The 2004 assessment found two of two FC samples exceed the former 400 cfu/100 ml instantaneous criterion. Exceeding values are 2100 and 4900 cfu/100 ml.

4ABOR024.46- (Rt. 460 Bridge near intersection Rt.'s 460 & 706) Three of nine E.coli samples exceed the 235 cfu/100 ml instantaneous criterion in 2008 and 2010. Exceeding values range from 420 to greater than 2000 cfu/100 ml. The 2006 and 2004 assessments find two of two FC samples exceed the former 400 cfu/100 ml instantaneous criterion. Exceeding values are 7000 cfu/100 ml and greater than 160,000.

Assessment Unit / Water Name / Description	Cause	Category / Name	Nested	Cycle First Listed	TMDL Schedule or EPA Approval	Size
VAW-L25R_BOR01A02 / Big Otter River / Big Otter River mainstem from the mouth of the Little Otter River upstream to the Elk Creek confluence on the Big Otter River.	4A	Escherichia coli		2008	2/2/2001	4.42
VAW-L25R_ECR01A00 / Elk Creek / Elk Creek mainstem from its mouth on the Big Otter River upstream to the Rt. 622 crossing west of Forest, VA.	4A	Escherichia coli		2008	2/2/2001	7.27
VAW-L25R_ECR02A02 / Elk Creek / Elk Creek mainstem from and unnamed tributary near Norwood (37°20'25" / 79°21'32") Rt. 622 crossing, upstream to near Perrowville (37°24'58" / 79°21'07") at another unnamed tributary.	4A	Escherichia coli		2008	2/2/2001	11.86

Big Otter River, Elk Creek and North Otter Creek **DCR Watershed: L25***	Estuary (Sq. Miles)	Reservoir (Acres)	River (Miles)
Escherichia coli - Total Impaired Size by Water Type:			**23.55**

Assessment Unit / Water Name / Description	Cause	Category / Name	Nested	Cycle First Listed	TMDL Schedule or EPA Approval	Size
VAW-L25R_BOR02A02 / Big Otter River / Big Otter River mainstem from the confluence of Elk Creek upstream to the mouth of Roaring Run.	4A	Fecal Coliform		2004	2/2/2001	5.92
VAW-L25R_BOR03A04 / Big Otter River / Confluence of North Otter Creek downstream to the mouth of Roaring Run.	4A	Fecal Coliform		2004	2/2/2001	1.36

2010 Impaired Waters

Categories 4 and 5 by DCR Watershed*

Roanoke and Yadkin River Basins

Fact Sheet prepared for DCR Watershed: L25*

Big Otter River, Elk Creek and North Otter Creek **DCR Watershed: L25***	Estuary (Sq. Miles)	Reservoir (Acres)	River (Miles)
Fecal Coliform - Total Impaired Size by Water Type:			**7.28**

Sources:

Livestock (Grazing or Feeding Operations)	On-site Treatment Systems (Septic Systems and Similar Decentralized Systems)	Unspecified Domestic Waste	Wildlife Other than Waterfowl

*Header Information: Location, City/County, Cause/VA Category and Narratives; describe the entire extent of the Impairment. Sizes presented are for Assessment Units (AUs) lying within the DCR Watershed boundary noted above.

Addendum to the Big Otter River Basin Fecal Coliform TMDLs (January 2001)

EPA's comments, as provided in their letter reviewing the fecal coliform TMDLs for five impaired segments in the Big Otter River basin, are re-stated in italics and followed by the particular response for each comment.

EPA: Section 5.2.1, States that there are two point sources (Gunnoe Sausage Company and Otter River Elementary School) in the Elk Creek watershed. However, section 5.3.2 states that there is only one permitted point source. It is mentioned that neither of these facilities discharge to the impaired segment of Elk Creek. How many point sources are there within the Elk Creek watershed? How was their load allocated to the Big Otter? For the allocation were the point sources modeled as discharging at their permitted concentration?

Response: There are two point sources for fecal coliform in the Elk Creek watershed: Gunnoe Sausage Company (VA0001449) and Otter River Elementary School (VA0020851). Neither of these contributed fecal coliform to the impaired segment on Elk Creek. Only the Gunnoe Sausage Company (VA0001449) was used in the simulations as a contributor to the impairment of the Lower Big Otter River. The Otter River Elementary School (VA0020851) was not used in the simulations for the Lower Big Otter River impairment because the design flow for this source was 0.0696 cfs, which was considered insignificant. The Gunnoe Sausage Company point source (VA0001449) was modeled as discharging fecal coliform at the permitted concentration for the allocation. Table 1 summarizes the flow and load information for Elk Creek. The point source load from Elk Creek was incorporated into the Lower Big Otter TMDL simulations as an upstream inflow. As modeled, the outflow from Elk Creek flows into Buffalo Creek, and the Buffalo Creek outflow is an inflow into the Lower Big Otter River.

Table 1. The hourly and annual loads from the point sources in the Elk Creek watershed.

PS Discharge	Flow (cfs)	Load (cfu/hr)	Annual Load[1] (cfu/yr)
VA0001449	0.6003	122,500,000	1.07×10^{12}
VA0020851 [2]	0.0696	14,200,000	1.24×10^{11}
Total			1.19×10^{12}

[1] Annual load is hourly load times 8,760 hr/yr

[2] Does not contribute to impaired segment in Elk Creek HUP.

EPA: Section 7.2.1, States that there are four permitted point sources in the Little Otter River watershed. However, in Section 7.3.2 it mentions that there are five permitted point sources, two of which were modeled for. Please verify the number of permitted point sources within this watershed. Was the Waste Load Allocation (WLA) set at a value that incorporates the permitted discharge of all of the permitted point sources? How was the loading from the facilities not modeled incorporated into the WLA and how was it determined that this additional loading would not affect the model? A WLA for each point source should be provided as an addendum to the report. A modeling run showing the effects of the non-modeled point sources should be provided with the addendum.

FINAL REGULATIONS

For information concerning Final Regulations, see Information Page.

Symbol Key

Roman type indicates existing text of regulations. *Italic type* indicates new text. Language which has been stricken indicates text to be deleted. [Bracketed language] indicates a change from the proposed text of the regulation.

TITLE 9. ENVIRONMENT

STATE WATER CONTROL BOARD

Title of Regulation: **9 VAC 25-720. Water Quality Management Planning Regulation (amending 9 VAC 25-720-80).**

Statutory Authority: § 62.1-44.15 of the Code of Virginia; Clean Water Act (33 USC § 1313 (e)); 40 CFR Part 130.

Effective Date: December 28, 2005.

Agency Contact: Jason R. Hill, Department of Environmental Quality, 3019 Peters Creek Road, Roanoke, VA 24019, telephone (540) 562-6724, FAX (540) 562-6729, or e-mail jrhill@deq.virginia.gov.

Summary:

The amendment to the Roanoke River Basin section (9 VAC 25-720-80 B) establishes a standard format for data presentation and updates the data and information contained in this portion of the regulation to provide consistency with the current VPDES permits.

Summary of Public Comments and Agency's Response: A summary of comments made by the public and the agency's response may be obtained from the promulgating agency or viewed at the office of the Registrar of Regulations.

9 VAC 25-720-80. Roanoke River Basin.

EDITOR'S NOTE: 9 VAC 25-720-80 A is not amended; therefore, the text is not set out. 9 VAC 25-720-80 B is stricken in its entirety and is not set out. The new text for 9 VAC 25-720-80 B is set out below.

B. Non-TMDL waste load allocations.

Water Body	*Permit No.*	*Facility Name*	*Outfall No.*	*Receiving Stream*	*River Mile*	*Parameter Description*	*WLA*	*Units WLA*
VAW-L04R	*VA0072389*	*Oak Ridge Mobile Home Park*	*001*	*Falling Creek UT*	*0.32*	*BOD_5*	*0.85*	*KG/D*
VAW-L04R	*VA0025020*	*Roanoke City Regional*	*001*	*Roanoke River*	*201.81*	*BOD_5*	*1173*	*KG/D*
		Water Pollution Control Plant				*TKN, APR-SEP*	*318*	*KG/D*
						TKN, OCT-MAR	*636*	*KG/D*
			001	*Roanoke River*	*201.81*	*BOD_5*	*1173*	*KG/D*
						TKN, APR-SEP	*416*	*KG/D*
						TKN, OCT-MAR	*832*	*KG/D*
			001	*Roanoke River*	*201.81*	*BOD_5*	*1173*	*KG/D*
						TKN, APR-SEP	*469*	*KG/D*
						TKN, OCT-MAR	*939*	*KG/D*
VAW-L04R	*VA0077895*	*Roanoke Moose Lodge*	*001*	*Mason Creek*	*7.79*	*BOD_5, JUN-SEP*	*0.24*	*KG/D*
						TKN, JUN-SEP	*0.09*	*KG/D*
VAW-L07R	*VA0020842*	*Bedford County School Board- Stewartsville Elementary School*	*001*	*Nat Branch, UT*	*0.59*	*BOD_5*	*0.5*	*KG/D*
VAW-L14R	*VA0029254*	*Ferrum Water and Sewage Auth. - Ferrum Sewage Treatment Plant*	*001*	*Storey Creek*	*9.78*	*BOD_5*	*14.2*	*KG/D*
VAW-L14R	*VA0085952*	*Rocky Mount Town Sewage Treatment Plant*	*001*	*Pigg River*	*52*	*BOD_5*	*133*	*KG/D*
VAW-L14R	*VA0076015*	*Ronile Incorporated*	*001*	*Pigg River*	*57.24*	*BOD_5*	*14.8*	*KG/D*
VAW-L21R	*VA0063738*	*Bedford County School Board - Staunton River High School*	*001*	*Shoulder Run, UT*	*0.95*	*BOD_5*	*1.8*	*KG/D*
VAW-L21R	*VA0020869*	*Bedford County School Board - Thaxton Elementary School*	*001*	*Wolf Creek, UT*	*0.35*	*BOD_5*	*0.31*	*KG/D*
VAW-L22R	*VA0023515*	*Blue Ridge Regional Jail Auth. - Moneta Adult Detention Facility STP*	*001*	*Mattox Creek, UT*	*3.76*	*BOD_5*	*1.66*	*KG/D*
VAW-L25R	*VA0020851*	*Bedford County School Board - Otter River Elementary School*	*001*	*Big Otter River, UT*	*1.15*	*BOD_5*	*0.4*	*KG/D*

VAW-L26R	VA0022390	Bedford City - Sewage Treatment Plant	001	Little Otter River	14.36	BOD_5	52.8	KG/D
VAW-L26R	VA0020818	Bedford County School Board - Body Camp Elementary	001	Wells Creek, UT	2.22	BOD_5	0.4	KG/D
VAW-L27R	VA0020826	Bedford County School Board - New London Academy	001	Buffalo Creek, UT	0.67	BOD_5	0.39	KG/D
VAC-L29R	VA0031194	Briarwood Village Mobile Home Park STP	001	Smith Branch, UT	2.82	BOD_5	1.3	KG/D
VAC-L35R	VA0023965	Campbell Co Util & Serv Auth. - Rustburg	001	Mollys Creek	17.81	BOD_5	8.13	KG/D
VAC-L39R	VA0084433	Drakes Branch WWTP	001	Twitty's Creek	6.04	BOD_5	6.4	KG/D
VAC-L39R	VA0024058	Keysville WWTP	001	Ash Camp Creek	7.63	$CBOD_5$, MAY-NOV	32.1	KG/D
						TKN, MAY-NOV	7.57	KG/D
VAC-L39R	VA0050822	Westpoint Stevens Inc Drakes Branch	001	Twittys Creek	7.22	BOD_5	6.31	KG/D
VAW-L43R	VA0022985	Stuart Town - Sewage Treatment Plant	001	South Mayo River	30.78	BOD_5	63.5	KG/D
VAW-L54R	VA0069345	Henry Co Public Service Auth. - Lower Smith River STP	001	Smith River	19.4	BOD_5	257	KG/D
VAW-L54R	VA0025305	Martinsville City Sewage Treatment Plant	001	Smith River	22.69	BOD_5	681	KG/D
VAC-L60R	VA0060593	Danville City - Northside	001	Dan River	53.32	BOD_5	1907	KG/D
						TKN, JUN-OCT	1817	KG/D
[VAC-L66R	VA0020524	Town of Chatham STP	001	Cherrystone Creek	2.49	$CBOD_5$ TKN	64.8 38.9	KG/D KG/D]
VAC-L75L	VA0020168	Clarksville WWTP	001	Blue Creek/John H. Kerr Reservoir	0.1	BOD_5	59.5	KG/D
VAC-L77R	VA0076881	Chase City Regional WWTP	001	Little Bluestone Creek	13.67	$CBOD_5$, MAY-NOV	29.5	KG/D
						TKN, MAY-NOV	9.5	KG/D
VAC-L78R	VA0026247	Boydton WWTP	001	Coleman Creek	3.79	$CBOD_5$, MAY-NOV	17.7	KG/D
						TKN, MAY-NOV	4.1	KG/D
VAC-L79R	VA0069337	South Hill WWTP	001	Flat Creek	8.95	$CBOD_5$, APR-NOV	60.6	KG/D

VA.R. Doc. No. R04-123; Filed November 7, 2005, 2:14 p.m.

Attachment F

Wasteload and Limit Calculations

- Mixing Zone Calculations (MIX)
- Effluent Data
- Wasteload Allocation Spreadsheet
- STATS Program Results
- Basis for Ammonia Limitations

Mixing Zone Predictions for Bedford Co Otter River E.S. - VA0020851

Effluent Flow = 0.0045 MGD
Stream 7Q10 = .0093 MGD
Stream 30Q10 = .014 MGD
Stream 1Q10 = .008 MGD
Stream slope = .0146 ft/ft
Stream width = 4 ft
Bottom scale = 3
Channel scale = 1

Mixing Zone Predictions @ 7Q10

Depth = .0324 ft
Length = 263.27 ft
Velocity = .1647 ft/sec
Residence Time = .0185 days

Recommendation:

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

Mixing Zone Predictions @ 30Q10

Depth = .0387 ft
Length = 226.77 ft
Velocity = .1849 ft/sec
Residence Time = .0142 days

Recommendation:

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

Mixing Zone Predictions @ 1Q10

Depth = .0305 ft
Length = 277.05 ft
Velocity = .1583 ft/sec
Residence Time = .486 hours

Recommendation:

A complete mix assumption is appropriate for this situation and the entire 1Q10 may be used.

Virginia DEQ Mixing Zone Analysis Version 2.1

Due Date	pH-Min	pH-Max	10th %'ile (EST) pH	90%'ile (EST) pH
10-Mar-2000	6.9	7.4	7.0	7.3
10-Apr-2000	7	7.9	7.1	7.8
10-May-2000	7	7.4	7.1	7.3
10-Jun-2000	7.5	8.2	7.6	8.1
10-Jul-2000	7.5	8.4	7.6	8.3
10-Feb-2001	7.1	8.1	7.3	7.9
10-Mar-2001	7.2	8	7.3	7.9
10-Apr-2001	7.6	8.1	7.7	8.0
10-May-2001	7.5	8.1	7.6	8.0
10-Jun-2001	7.5	8.6	7.7	8.4
10-Jul-2001	8	8	8.0	8.0
10-Oct-2001	7	8.1	7.2	7.9
10-Nov-2001	7.1	7.8	7.2	7.7
10-Dec-2001	6.9	7.4	7.0	7.3
10-Jan-2002	7	8.2	7.2	8.0
10-Feb-2002	7.4	8	7.5	7.9
10-Mar-2002	7.1	8.3	7.3	8.1
10-Apr-2002	6.8	8	7.0	7.8
10-May-2002	6.7	8	6.9	7.8
10-Jun-2002	7	8	7.2	7.8
10-Jul-2002	7	8	7.2	7.8
10-Oct-2002	7	8.5	7.2	8.3
10-Nov-2002	7.3	8.5	7.5	8.3
10-Dec-2002	7.3	8.2	7.4	8.1
10-Jan-2003	7.5	8	7.6	7.9
10-Feb-2003	7.7	8.2	7.8	8.1
10-Mar-2003	7.4	8	7.5	7.9
10-Apr-2003	7.3	8	7.4	7.9
10-May-2003	7.3	8.1	7.4	8.0
10-Jun-2003	6.9	8	7.1	7.8
10-Jul-2003	7	7.5	7.1	7.4
10-Oct-2003	7	7.7	7.1	7.6
10-Nov-2003	7	7.5	7.1	7.4
10-Dec-2003	6.6	8	6.8	7.8
10-Jan-2004	7	8	7.2	7.8
10-Feb-2004	7	8	7.2	7.8
10-Mar-2004	7	8	7.2	7.8
10-Apr-2004	6.8	8	7.0	7.8
10-May-2004	6.5	8	6.7	7.8
10-Jun-2004	6.5	7.5	6.7	7.3
10-Jul-2004	6.5	7	6.6	6.9
10-Oct-2004	6.5	8	6.7	7.8
10-Nov-2004	7	8	7.2	7.8
10-Dec-2004	7	8	7.2	7.8
10-Jan-2005	8	8	8.0	8.0
10-Feb-2005	7.5	8	7.6	7.9
10-Mar-2005	7.5	8	7.6	7.9
10-Apr-2005	7	8	7.2	7.8
10-May-2005	7.5	8	7.6	7.9
10-Jun-2005	7.5	8	7.6	7.9
10-Jul-2005	7.5	8	7.6	7.9
10-Aug-2005	7.5	7.5	7.5	7.5
10-Oct-2005	7.5	8	7.6	7.9
10-Nov-2005	7.5	8	7.6	7.9
10-Dec-2005	7.5	8	7.6	7.9
10-Jan-2006	7.5	8	7.6	7.9
10-Feb-2006	7	8	7.2	7.8
10-Mar-2006	7	8	7.2	7.8
10-Apr-2006	7	8	7.2	7.8
10-May-2006	7	8	7.2	7.8
10-Jun-2006	7	8	7.2	7.8
10-Jul-2006	7.5	8	7.6	7.9
10-Oct-2006	7.1	7.5	7.2	7.4
10-Nov-2006	7.2	8	7.3	7.9
10-Dec-2006	7.1	8	7.2	7.9
10-Jan-2007	7	7.9	7.1	7.8
10-Feb-2007	7.3	8.1	7.4	8.0

Due Date	pH-Min	pH-Max	10th %'ile (EST) pH	90%'ile (EST) pH
10-Mar-2007	7.5	8.7	7.7	8.5
10-Apr-2007	7	8.3	7.2	8.1
10-May-2007	7	8	7.2	7.8
10-Jun-2007	7	8	7.2	7.8
10-Jul-2007	7	7.8	7.1	7.7
10-Oct-2007	7	8.1	7.2	7.9
10-Nov-2007	7	8	7.2	7.8
10-Dec-2007	7.2	8.4	7.4	8.2
10-Jan-2008	6.9	8.1	7.1	7.9
10-Feb-2008	7.1	8.2	7.3	8.0
10-Mar-2008	7.1	8.2	7.3	8.0
10-Apr-2008	7.1	8.2	7.3	8.0
10-May-2008	7.2	8	7.3	7.9
10-Jun-2008	7	7.6	7.1	7.5
10-Jul-2008	7.1	7.5	7.2	7.4
10-Oct-2008	7.6	8	7.7	7.9
10-Nov-2008	7.6	8.2	7.7	8.1
10-Dec-2008	7.2	8.2	7.4	8.0
10-Jan-2009	7	8.3	7.2	8.1
10-Feb-2009	7	8.3	7.2	8.1
10-Mar-2009	7	8.4	7.2	8.2
10-Apr-2009	7.3	8.3	7.5	8.1
10-May-2009	7.3	8.2	7.4	8.1
10-Jun-2009	7.2	8.3	7.4	8.1
10-Jul-2009	7.2	8.1	7.3	8.0
10-Oct-2009	7.3	8.6	7.5	8.4
10-Nov-2009	6.8	8.5	7.1	8.2
10-Dec-2009	7	8.5	7.2	8.3
10-Jan-2010	7.7	8.3	7.8	8.2
10-Feb-2010	6.9	8.4	7.1	8.2
10-Mar-2010	7	8.3	7.2	8.1
10-Apr-2010	7	8.4	7.2	8.2
10-May-2010	7.1	8.2	7.3	8.0
10-Jun-2010	6.9	8.1	7.1	7.9
10-Jul-2010	7.5	8	7.6	7.9
10-Sep-2010	7	7.8	7.1	7.7
10-Oct-2010	7.1	8	7.2	7.9
10-Nov-2010	7	8.4	7.2	8.2
10-Dec-2010	7.4	8	7.5	7.9
10-Jan-2011	7.2	7.9	7.3	7.8
10-Feb-2011	7	8.2	7.2	8.0
10-Mar-2011	7	8.2	7.2	8.0
10-Apr-2011	6.9	8.1	7.1	7.9
10-May-2011	6.8	7.8	7.0	7.6
10-Jun-2011	7	8.2	7.2	8.0
10-Jul-2011	8	8.2	8.0	8.2
10-Sep-2011	8.1	8.4	8.1	8.4
10-Oct-2011	7.2	8.2	7.4	8.0
10-Nov-2011	7	8.4	7.2	8.2
10-Dec-2011	7.4	8.3	7.5	8.2
10-Jan-2012	7	8.3	7.2	8.1
10-Feb-2012	7.1	8.5	7.3	8.3
10-Mar-2012	7.6	8.4	7.7	8.3
10-Apr-2012	7.2	8.2	7.4	8.0
10-May-2012	7	8	7.2	7.8
10-Jun-2012	7.1	8	7.2	7.9
10-Jul-2012	7.2	7.9	7.3	7.8
10-Sep-2012	8	8.5	8.1	8.4
10-Oct-2012	7.3	8.6	7.5	8.4
10-Nov-2012	7.4	8.6	7.6	8.4
10-Dec-2012	7.6	8.7	7.8	8.5
10-Jan-2013	7.3	8.7	7.5	8.5
10-Feb-2013	7.1	8	7.2	7.9
10-Mar-2013	7	8.1	7.2	7.9
10-Apr-2013	7	8.4	7.2	8.2
10-May-2013	7.1	8.2	7.3	8.0
Average			7.3	7.9

FRESHWATER
WATER QUALITY CRITERIA / WASTELOAD ALLOCATION ANALYSIS

Facility Name: Otter River Elementary STP

Permit No.: VA0020851

Receiving Stream: UT to Big Otter River

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

Stream Information

Mean Hardness (as CaCO3) =	30	mg/L
90% Temperature (Annual) =	25	deg C
90% Temperature (Wet season) =	16	deg C
90% Maximum pH =	8.5	SU
10% Maximum pH =	7	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) =	0	MGD
7Q10 (Annual) =	0	MGD
30Q10 (Annual) =	0	MGD
1Q10 (Wet season) =	0	MGD
30Q10 (Wet season)	0	MGD
30Q5 =	0	MGD
Harmonic Mean =	0	MGD

Mixing Information

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

Effluent Information

Mean Hardness (as CaCO3) =	30	mg/L
90% Temp (Annual) =	20	deg C
90% Temp (Wet season) =	12	deg C
90% Maximum pH =	7.9	SU
10% Maximum pH =	7.3	SU
Discharge Flow =	0.0045	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	--	--	6.7E+02	9.9E+02	--	--	6.7E+01	9.9E+01	--	--	6.7E+01	9.9E+01	--	--	6.7E+01	9.9E+01
Acrolein	0	--	--	6.1E+00	9.3E+00	--	--	6.1E+00	9.3E+00	--	--	6.1E-01	9.3E-01	--	--	6.1E-01	9.3E-01	--	--	6.1E-01	9.3E-01
Acrylonitrile[c]	0	--	--	5.1E-01	2.5E+00	--	--	5.1E-01	2.5E+00	--	--	5.1E-02	2.5E-01	--	--	5.1E-02	2.5E-01	--	--	5.1E-02	2.5E-01
Aldrin[c]	0	3.0E+00	--	4.9E-04	5.0E-04	3.0E+00	--	4.9E-04	5.0E-04	7.5E-01	--	4.9E-05	5.0E-05	7.5E-01	--	4.9E-05	5.0E-05	7.5E-01	--	4.9E-05	5.0E-05
Ammonia-N (mg/l) (Yearly)	0	1.01E+01	1.96E+00	--	--	1.01E+01	1.96E+00	--	--	2.53E+00	4.91E-01	--	--	2.53E+00	4.91E-01	--	--	2.53E+00	4.91E-01	--	--
Ammonia-N (mg/l) (High Flow)	0	1.01E+01	2.80E+00	--	--	1.01E+01	2.80E+00	--	--	2.53E+00	6.99E-01	--	--	2.53E+00	6.99E-01	--	--	2.53E+00	6.99E-01	--	--
Anthracene	0	--	--	8.3E+03	4.0E+04	--	--	8.3E+03	4.0E+04	--	--	8.3E+02	4.0E+03	--	--	8.3E+02	4.0E+03	--	--	8.3E+02	4.0E+03
Antimony	0	--	--	5.6E+00	6.4E+02	--	--	5.6E+00	6.4E+02	--	--	5.6E-01	6.4E+01	--	--	5.6E-01	6.4E+01	--	--	5.6E-01	6.4E+01
Arsenic	0	3.4E+02	1.5E+02	1.0E+01	--	3.4E+02	1.5E+02	1.0E+01	--	8.5E+01	3.8E+01	1.0E+00	--	8.5E+01	3.8E+01	1.0E+00	--	8.5E+01	3.8E+01	1.0E+00	--
Barium	0	--	--	2.0E+03	--	--	--	2.0E+03	--	--	--	2.0E+02	--	--	--	2.0E+02	--	--	--	2.0E+02	--
Benzene[c]	0	--	--	2.2E+01	5.1E+02	--	--	2.2E+01	5.1E+02	--	--	2.2E+00	5.1E+01	--	--	2.2E+00	5.1E+01	--	--	2.2E+00	5.1E+01
Benzidine[c]	0	--	--	8.6E-04	2.0E-03	--	--	8.6E-04	2.0E-03	--	--	8.6E-05	2.0E-04	--	--	8.6E-05	2.0E-04	--	--	8.6E-05	2.0E-04
Benzo (a) anthracene[c]	0	--	--	3.8E-02	1.8E-01	--	--	3.8E-02	1.8E-01	--	--	3.8E-03	1.8E-02	--	--	3.8E-03	1.8E-02	--	--	3.8E-03	1.8E-02
Benzo (b) fluoranthene[c]	0	--	--	3.8E-02	1.8E-01	--	--	3.8E-02	1.8E-01	--	--	3.8E-03	1.8E-02	--	--	3.8E-03	1.8E-02	--	--	3.8E-03	1.8E-02
Benzo (k) fluoranthene[c]	0	--	--	3.8E-02	1.8E-01	--	--	3.8E-02	1.8E-01	--	--	3.8E-03	1.8E-02	--	--	3.8E-03	1.8E-02	--	--	3.8E-03	1.8E-02
Benzo (a) pyrene[c]	0	--	--	3.8E-02	1.8E-01	--	--	3.8E-02	1.8E-01	--	--	3.8E-03	1.8E-02	--	--	3.8E-03	1.8E-02	--	--	3.8E-03	1.8E-02
Bis2-Chloroethyl Ether[c]	0	--	--	3.0E-01	5.3E+00	--	--	3.0E-01	5.3E+00	--	--	3.0E-02	5.3E-01	--	--	3.0E-02	5.3E-01	--	--	3.0E-02	5.3E-01
Bis2-Chloroisopropyl Ether	0	--	--	1.4E+03	6.5E+04	--	--	1.4E+03	6.5E+04	--	--	1.4E+02	6.5E+03	--	--	1.4E+02	6.5E+03	--	--	1.4E+02	6.5E+03
Bis 2-Ethylhexyl Phthalate[c]	0	--	--	1.2E+01	2.2E+01	--	--	1.2E+01	2.2E+01	--	--	1.2E+00	2.2E+00	--	--	1.2E+00	2.2E+00	--	--	1.2E+00	2.2E+00
Bromoform[c]	0	--	--	4.3E+01	1.4E+03	--	--	4.3E+01	1.4E+03	--	--	4.3E+00	1.4E+02	--	--	4.3E+00	1.4E+02	--	--	4.3E+00	1.4E+02
Butylbenzylphthalate	0	--	--	1.5E+03	1.9E+03	--	--	1.5E+03	1.9E+03	--	--	1.5E+02	1.9E+02	--	--	1.5E+02	1.9E+02	--	--	1.5E+02	1.9E+02
Cadmium	0	1.0E+00	4.4E-01	5.0E+00	--	1.0E+00	4.4E-01	5.0E+00	--	2.5E-01	1.1E-01	5.0E-01	--	2.5E-01	1.1E-01	5.0E-01	--	2.5E-01	1.1E-01	5.0E-01	--
Carbon Tetrachloride[c]	0	--	--	2.3E+00	1.6E+01	--	--	2.3E+00	1.6E+01	--	--	2.3E-01	1.6E+00	--	--	2.3E-01	1.6E+00	--	--	2.3E-01	1.6E+00
Chlordane[c]	0	2.4E+00	4.3E-03	8.0E-03	8.1E-03	2.4E+00	4.3E-03	8.0E-03	8.1E-03	6.0E-01	1.1E-03	8.0E-04	8.1E-04	6.0E-01	1.1E-03	8.0E-04	8.1E-04	6.0E-01	1.1E-03	8.0E-04	8.1E-04
Chloride	0	8.6E+05	2.3E+05	2.5E+05	--	8.6E+05	2.3E+05	2.5E+05	--	2.2E+05	5.8E+04	2.5E+04	--	2.2E+05	5.8E+04	2.5E+04	--	2.2E+05	5.8E+04	2.5E+04	--
TRC	0	1.9E+01	1.1E+01	--	--	1.9E+01	1.1E+01	--	--	4.8E+00	2.8E+00	--	--	4.8E+00	2.8E+00	--	--	4.8E+00	2.8E+00	--	--
Chlorobenzene	0	--	--	1.3E+02	1.6E+03	--	--	1.3E+02	1.6E+03	--	--	1.3E+01	1.6E+02	--	--	1.3E+01	1.6E+02	--	--	1.3E+01	1.6E+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
Chlorodibromomethane[g]	0	--	--	4.0E+00	1.3E+02	--	--	4.0E+00	1.3E+02	--	--	4.0E-01	1.3E+01	--	--	4.0E-01	1.3E+01	--	--	4.0E-01	1.3E+01
Chloroform	0	--	--	3.4E+02	1.1E+04	--	--	3.4E+02	1.1E+04	--	--	3.4E+01	1.1E+03	--	--	3.4E+01	1.1E+03	--	--	3.4E+01	1.1E+03
2-Chloronaphthalene	0	--	--	1.0E+03	1.6E+03	--	--	1.0E+03	1.6E+03	--	--	1.0E+02	1.6E+02	--	--	1.0E+02	1.6E+02	--	--	1.0E+02	1.6E+02
2-Chlorophenol	0	--	--	8.1E+01	1.5E+02	--	--	8.1E+01	1.5E+02	--	--	8.1E+00	1.5E+01	--	--	8.1E+00	1.5E+01	--	--	8.1E+00	1.5E+01
Chlorpyrifos	0	8.3E-02	4.1E-02	--	--	8.3E-02	4.1E-02	--	--	2.1E-02	1.0E-02	--	--	2.1E-02	1.0E-02	--	--	2.1E-02	1.0E-02	--	--
Chromium III	0	2.1E+02	2.8E+01	--	--	2.1E+02	2.8E+01	--	--	5.3E+01	6.9E+00	--	--	5.3E+01	6.9E+00	--	--	5.3E+01	6.9E+00	--	--
Chromium VI	0	1.6E+01	1.1E+01	--	--	1.6E+01	1.1E+01	--	--	4.0E+00	2.8E+00	--	--	4.0E+00	2.8E+00	--	--	4.0E+00	2.8E+00	--	--
Chromium, Total	0	--	--	1.0E+02	--	--	--	1.0E+02	--	--	--	1.0E+01	--	--	--	1.0E+01	--	--	--	1.0E+01	--
Chrysene[c]	0	--	--	3.8E-03	1.8E-02	--	--	3.8E-03	1.8E-02	--	--	3.8E-04	1.8E-03	--	--	3.8E-04	1.8E-03	--	--	3.8E-04	1.8E-03
Copper	0	4.3E+00	3.2E+00	1.3E+03	--	4.3E+00	3.2E+00	1.3E+03	--	1.1E+00	8.0E-01	1.3E+02	--	1.1E+00	8.0E-01	1.3E+02	--	1.1E+00	8.0E-01	1.3E+02	--
Cyanide, Free	0	2.2E+01	5.2E+00	1.4E+02	1.6E+04	2.2E+01	5.2E+00	1.4E+02	1.6E+04	5.5E+00	1.3E+00	1.4E+01	1.6E+03	5.5E+00	1.3E+00	1.4E+01	1.6E+03	5.5E+00	1.3E+00	1.4E+01	1.6E+03
DDD[c]	0	--	--	3.1E-03	3.1E-03	--	--	3.1E-03	3.1E-03	--	--	3.1E-04	3.1E-04	--	--	3.1E-04	3.1E-04	--	--	3.1E-04	3.1E-04
DDE[c]	0	--	--	2.2E-03	2.2E-03	--	--	2.2E-03	2.2E-03	--	--	2.2E-04	2.2E-04	--	--	2.2E-04	2.2E-04	--	--	2.2E-04	2.2E-04
DDT[c]	0	1.1E+00	1.0E-03	2.2E-03	2.2E-03	1.1E+00	1.0E-03	2.2E-03	2.2E-03	2.8E-01	2.5E-04	2.2E-04	2.2E-04	2.8E-01	2.5E-04	2.2E-04	2.2E-04	2.8E-01	2.5E-04	2.2E-04	2.2E-04
Demeton	0	--	1.0E-01	--	--	--	1.0E-01	--	--	--	2.5E-02	--	--	--	2.5E-02	--	--	--	2.5E-02	--	--
Diazinon	0	1.7E-01	1.7E-01	--	--	1.7E-01	1.7E-01	--	--	4.3E-02	4.3E-02	--	--	4.3E-02	4.3E-02	--	--	4.3E-02	4.3E-02	--	--
Dibenz(a,h)anthracene[c]	0	--	--	3.8E-02	1.8E-01	--	--	3.8E-02	1.8E-01	--	--	3.8E-03	1.8E-02	--	--	3.8E-03	1.8E-02	--	--	3.8E-03	1.8E-02
1,2-Dichlorobenzene	0	--	--	4.2E+02	1.3E+03	--	--	4.2E+02	1.3E+03	--	--	4.2E+01	1.3E+02	--	--	4.2E+01	1.3E+02	--	--	4.2E+01	1.3E+02
1,3-Dichlorobenzene	0	--	--	3.2E+02	9.6E+02	--	--	3.2E+02	9.6E+02	--	--	3.2E+01	9.6E+01	--	--	3.2E+01	9.6E+01	--	--	3.2E+01	9.6E+01
1,4-Dichlorobenzene	0	--	--	6.3E+01	1.9E+02	--	--	6.3E+01	1.9E+02	--	--	6.3E+00	1.9E+01	--	--	6.3E+00	1.9E+01	--	--	6.3E+00	1.9E+01
3,3-Dichlorobenzidine[g]	0	--	--	2.1E-01	2.8E-01	--	--	2.1E-01	2.8E-01	--	--	2.1E-02	2.8E-02	--	--	2.1E-02	2.8E-02	--	--	2.1E-02	2.8E-02
Dichlorobromomethane[c]	0	--	--	5.5E+00	1.7E+02	--	--	5.5E+00	1.7E+02	--	--	5.5E-01	1.7E+01	--	--	5.5E-01	1.7E+01	--	--	5.5E-01	1.7E+01
1,2-Dichloroethane[c]	0	--	--	3.8E+00	3.7E+02	--	--	3.8E+00	3.7E+02	--	--	3.8E-01	3.7E+01	--	--	3.8E-01	3.7E+01	--	--	3.8E-01	3.7E+01
1,1-Dichloroethylene	0	--	--	3.3E+02	7.1E+03	--	--	3.3E+02	7.1E+03	--	--	3.3E+01	7.1E+02	--	--	3.3E+01	7.1E+02	--	--	3.3E+01	7.1E+02
1,2-trans-dichloroethylene	0	--	--	1.4E+02	1.0E+04	--	--	1.4E+02	1.0E+04	--	--	1.4E+01	1.0E+03	--	--	1.4E+01	1.0E+03	--	--	1.4E+01	1.0E+03
2,4-Dichlorophenol	0	--	--	7.7E+01	2.9E+02	--	--	7.7E+01	2.9E+02	--	--	7.7E+00	2.9E+01	--	--	7.7E+00	2.9E+01	--	--	7.7E+00	2.9E+01
2,4-Dichlorophenoxy acetic acid (2,4-D)	0	--	--	1.0E+02	--	--	--	1.0E+02	--	--	--	1.0E+01	--	--	--	1.0E+01	--	--	--	1.0E+01	--
1,2-Dichloropropane[g]	0	--	--	5.0E+00	1.5E+02	--	--	5.0E+00	1.5E+02	--	--	5.0E-01	1.5E+01	--	--	5.0E-01	1.5E+01	--	--	5.0E-01	1.5E+01
1,3-Dichloropropene[c]	0	--	--	3.4E+00	2.1E+02	--	--	3.4E+00	2.1E+02	--	--	3.4E-01	2.1E+01	--	--	3.4E-01	2.1E+01	--	--	3.4E-01	2.1E+01
Dieldrin[c]	0	2.4E-01	5.6E-02	5.2E-04	5.4E-04	2.4E-01	5.6E-02	5.2E-04	5.4E-04	6.0E-02	1.4E-02	5.2E-05	5.4E-05	6.0E-02	1.4E-02	5.2E-05	5.4E-05	6.0E-02	1.4E-02	5.2E-05	5.4E-05
Diethyl Phthalate	0	--	--	1.7E+04	4.4E+04	--	--	1.7E+04	4.4E+04	--	--	1.7E+03	4.4E+03	--	--	1.7E+03	4.4E+03	--	--	1.7E+03	4.4E+03
2,4-Dimethylphenol	0	--	--	3.8E+02	8.5E+02	--	--	3.8E+02	8.5E+02	--	--	3.8E+01	8.5E+01	--	--	3.8E+01	8.5E+01	--	--	3.8E+01	8.5E+01
Dimethyl Phthalate	0	--	--	2.7E+05	1.1E+06	--	--	2.7E+05	1.1E+06	--	--	2.7E+04	1.1E+05	--	--	2.7E+04	1.1E+05	--	--	2.7E+04	1.1E+05
Di-n-Butyl Phthalate	0	--	--	2.0E+03	4.5E+03	--	--	2.0E+03	4.5E+03	--	--	2.0E+02	4.5E+02	--	--	2.0E+02	4.5E+02	--	--	2.0E+02	4.5E+02
2,4 Dinitrophenol	0	--	--	6.9E+01	5.3E+03	--	--	6.9E+01	5.3E+03	--	--	6.9E+00	5.3E+02	--	--	6.9E+00	5.3E+02	--	--	6.9E+00	5.3E+02
2-Methyl-4,6-Dinitrophenol	0	--	--	1.3E+01	2.8E+02	--	--	1.3E+01	2.8E+02	--	--	1.3E+00	2.8E+01	--	--	1.3E+00	2.8E+01	--	--	1.3E+00	2.8E+01
2,4-Dinitrotoluene[c]	0	--	--	1.1E+00	3.4E+01	--	--	1.1E+00	3.4E+01	--	--	1.1E-01	3.4E+00	--	--	1.1E-01	3.4E+00	--	--	1.1E-01	3.4E+00
Dioxin 2,3,7,8-tetrachlorodibenzo-p-dioxin	0	--	--	5.0E-08	5.1E-08	--	--	5.0E-08	5.1E-08	--	--	5.0E-09	5.1E-09	--	--	5.0E-09	5.1E-09	--	--	5.0E-09	5.1E-09
1,2-Diphenylhydrazine[g]	0	--	--	3.6E-01	2.0E+00	--	--	3.6E-01	2.0E+00	--	--	3.6E-02	2.0E-01	--	--	3.6E-02	2.0E-01	--	--	3.6E-02	2.0E-01
Alpha-Endosulfan	0	2.2E-01	5.6E-02	6.2E+01	8.9E+01	2.2E-01	5.6E-02	6.2E+01	8.9E+01	5.5E-02	1.4E-02	6.2E+00	8.9E+00	5.5E-02	1.4E-02	6.2E+00	8.9E+00	5.5E-02	1.4E-02	6.2E+00	8.9E+00
Beta-Endosulfan	0	2.2E-01	5.6E-02	6.2E+01	8.9E+01	2.2E-01	5.6E-02	6.2E+01	8.9E+01	5.5E-02	1.4E-02	6.2E+00	8.9E+00	5.5E-02	1.4E-02	6.2E+00	8.9E+00	5.5E-02	1.4E-02	6.2E+00	8.9E+00
Alpha + Beta Endosulfan	0	2.2E-01	5.6E-02	--	--	2.2E-01	5.6E-02	--	--	5.5E-02	1.4E-02	--	--	5.5E-02	1.4E-02	--	--	5.5E-02	1.4E-02	--	--
Endosulfan Sulfate	0	--	--	6.2E+01	8.9E+01	--	--	6.2E+01	8.9E+01	--	--	6.2E+00	8.9E+00	--	--	6.2E+00	8.9E+00	--	--	6.2E+00	8.9E+00
Endrin	0	8.6E-02	3.6E-02	5.9E-02	6.0E-02	8.6E-02	3.6E-02	5.9E-02	6.0E-02	2.2E-02	9.0E-03	5.9E-03	6.0E-03	2.2E-02	9.0E-03	5.9E-03	6.0E-03	2.2E-02	9.0E-03	5.9E-03	6.0E-03
Endrin Aldehyde	0	--	--	2.9E-01	3.0E-01	--	--	2.9E-01	3.0E-01	--	--	2.9E-02	3.0E-02	--	--	2.9E-02	3.0E-02	--	--	2.9E-02	3.0E-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
Ethylbenzene	0	--	--	5.3E+02	2.1E+03	--	--	5.3E+02	2.1E+03	--	--	5.3E+01	2.1E+02	--	--	5.3E+01	2.1E+02	--	--	5.3E+01	2.1E+02
Fluoranthene	0	--	--	1.3E+02	1.4E+02	--	--	1.3E+02	1.4E+02	--	--	1.3E+01	1.4E+01	--	--	1.3E+01	1.4E+01	--	--	1.3E+01	1.4E+01
Fluorene	0	--	--	1.1E+03	5.3E+03	--	--	1.1E+03	5.3E+03	--	--	1.1E+02	5.3E+02	--	--	1.1E+02	5.3E+02	--	--	1.1E+02	5.3E+02
Foaming Agents	0	--	--	5.0E+02	--	--	--	5.0E+02	--	--	--	5.0E+01	--	--	--	5.0E+01	--	--	--	5.0E+01	--
Guthion	0	--	1.0E-02	--	--	--	1.0E-02	--	--	--	2.5E-03	--	--	--	2.5E-03	--	--	--	2.5E-03	--	--
Heptachlor[c]	0	5.2E-01	3.8E-03	7.9E-04	7.9E-04	5.2E-01	3.8E-03	7.9E-04	7.9E-04	1.3E-01	9.5E-04	7.9E-05	7.9E-05	1.3E-01	9.5E-04	7.9E-05	7.9E-05	1.3E-01	9.5E-04	7.9E-05	7.9E-05
Heptachlor Epoxide[c]	0	5.2E-01	3.8E-03	3.9E-04	3.9E-04	5.2E-01	3.8E-03	3.9E-04	3.9E-04	1.3E-01	9.5E-04	3.9E-05	3.9E-05	1.3E-01	9.5E-04	3.9E-05	3.9E-05	1.3E-01	9.5E-04	3.9E-05	3.9E-05
Hexachlorobenzene[c]	0	--	--	2.8E-03	2.9E-03	--	--	2.8E-03	2.9E-03	--	--	2.8E-04	2.9E-04	--	--	2.8E-04	2.9E-04	--	--	2.8E-04	2.9E-04
Hexachlorobutadiene[c]	0	--	--	4.4E+00	1.8E+02	--	--	4.4E+00	1.8E+02	--	--	4.4E-01	1.8E+01	--	--	4.4E-01	1.8E+01	--	--	4.4E-01	1.8E+01
Hexachlorocyclohexane Alpha-BHC[c]	0	--	--	2.6E-02	4.9E-02	--	--	2.6E-02	4.9E-02	--	--	2.6E-03	4.9E-03	--	--	2.6E-03	4.9E-03	--	--	2.6E-03	4.9E-03
Hexachlorocyclohexane Beta-BHC[c]	0	--	--	9.1E-02	1.7E-01	--	--	9.1E-02	1.7E-01	--	--	9.1E-03	1.7E-02	--	--	9.1E-03	1.7E-02	--	--	9.1E-03	1.7E-02
Hexachlorocyclohexane Gamma-BHC[c] (Lindane)	0	9.5E-01	--	9.8E-01	1.8E+00	9.5E-01	--	9.8E-01	1.8E+00	2.4E-01	--	9.8E-02	1.8E-01	2.4E-01	--	9.8E-02	1.8E-01	2.4E-01	--	9.8E-02	1.8E-01
Hexachlorocyclopentadiene	0	--	--	4.0E+01	1.1E+03	--	--	4.0E+01	1.1E+03	--	--	4.0E+00	1.1E+02	--	--	4.0E+00	1.1E+02	--	--	4.0E+00	1.1E+02
Hexachloroethane[c]	0	--	--	1.4E+01	3.3E+01	--	--	1.4E+01	3.3E+01	--	--	1.4E+00	3.3E+00	--	--	1.4E+00	3.3E+00	--	--	1.4E+00	3.3E+00
Hydrogen Sulfide	0	--	2.0E+00	--	--	--	2.0E+00	--	--	--	5.0E-01	--	--	--	5.0E-01	--	--	--	5.0E-01	--	--
Indeno (1,2,3-cd) pyrene[c]	0	--	--	3.8E-02	1.8E-01	--	--	3.8E-02	1.8E-01	--	--	3.8E-03	1.8E-02	--	--	3.8E-03	1.8E-02	--	--	3.8E-03	1.8E-02
Iron	0	--	--	3.0E+02	--	--	--	3.0E+02	--	--	--	3.0E+01	--	--	--	3.0E+01	--	--	--	3.0E+01	--
Isophorone[c]	0	--	--	3.5E+02	9.6E+03	--	--	3.5E+02	9.6E+03	--	--	3.5E+01	9.6E+02	--	--	3.5E+01	9.6E+02	--	--	3.5E+01	9.6E+02
Kepone	0	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--	--
Lead	0	2.6E+01	2.9E+00	1.5E+01	--	2.6E+01	2.9E+00	1.5E+01	--	6.4E+00	7.3E-01	1.5E+00	--	6.4E+00	7.3E-01	1.5E+00	--	6.4E+00	7.3E-01	1.5E+00	--
Malathion	0	--	1.0E-01	--	--	--	1.0E-01	--	--	--	2.5E-02	--	--	--	2.5E-02	--	--	--	2.5E-02	--	--
Manganese	0	--	--	5.0E+01	--	--	--	5.0E+01	--	--	--	5.0E+00	--	--	--	5.0E+00	--	--	--	5.0E+00	--
Mercury	0	1.4E+00	7.7E-01	--	--	1.4E+00	7.7E-01	--	--	3.5E-01	1.9E-01	--	--	3.5E-01	1.9E-01	--	--	3.5E-01	1.9E-01	--	--
Methyl Bromide	0	--	--	4.7E+01	1.5E+03	--	--	4.7E+01	1.5E+03	--	--	4.7E+00	1.5E+02	--	--	4.7E+00	1.5E+02	--	--	4.7E+00	1.5E+02
Methylene Chloride[c]	0	--	--	4.6E+01	5.9E+03	--	--	4.6E+01	5.9E+03	--	--	4.6E+00	5.9E+02	--	--	4.6E+00	5.9E+02	--	--	4.6E+00	5.9E+02
Methoxychlor	0	--	3.0E-02	1.0E+02	--	--	3.0E-02	1.0E+02	--	--	7.5E-03	1.0E+01	--	--	7.5E-03	1.0E+01	--	--	7.5E-03	1.0E+01	--
Mirex	0	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--	--
Nickel	0	6.6E+01	7.3E+00	6.1E+02	4.6E+03	6.6E+01	7.3E+00	6.1E+02	4.6E+03	1.6E+01	1.8E+00	6.1E+01	4.6E+02	1.6E+01	1.8E+00	6.1E+01	4.6E+02	1.6E+01	1.8E+00	6.1E+01	4.6E+02
Nitrate (as N)	0	--	--	1.0E+04	--	--	--	1.0E+04	--	--	--	1.0E+03	--	--	--	1.0E+03	--	--	--	1.0E+03	--
Nitrobenzene	0	--	--	1.7E+01	6.9E+02	--	--	1.7E+01	6.9E+02	--	--	1.7E+00	6.9E+01	--	--	1.7E+00	6.9E+01	--	--	1.7E+00	6.9E+01
N-Nitrosodimethylamine[c]	0	--	--	6.9E-03	3.0E+01	--	--	6.9E-03	3.0E+01	--	--	6.9E-04	3.0E+00	--	--	6.9E-04	3.0E+00	--	--	6.9E-04	3.0E+00
N-Nitrosodiphenylamine[c]	0	--	--	3.3E+01	6.0E+01	--	--	3.3E+01	6.0E+01	--	--	3.3E+00	6.0E+00	--	--	3.3E+00	6.0E+00	--	--	3.3E+00	6.0E+00
N-Nitrosodi-n-propylamine[c]	0	--	--	5.0E-02	5.1E+00	--	--	5.0E-02	5.1E+00	--	--	5.0E-03	5.1E-01	--	--	5.0E-03	5.1E-01	--	--	5.0E-03	5.1E-01
Nonylphenol	0	2.8E+01	6.6E+00	--	--	2.8E+01	6.6E+00	--	--	7.0E+00	1.7E+00	--	--	7.0E+00	1.7E+00	--	--	7.0E+00	1.7E+00	--	--
Parathion	0	6.5E-02	1.3E-02	--	--	6.5E-02	1.3E-02	--	--	1.6E-02	3.3E-03	--	--	1.6E-02	3.3E-03	--	--	1.6E-02	3.3E-03	--	--
PCB Total[c]	0	--	1.4E-02	6.4E-04	6.4E-04	--	1.4E-02	6.4E-04	6.4E-04	--	3.5E-03	6.4E-05	6.4E-05	--	3.5E-03	6.4E-05	6.4E-05	--	3.5E-03	6.4E-05	6.4E-05
Pentachlorophenol[c]	0	1.2E+01	9.0E+00	2.7E+00	3.0E+01	1.2E+01	9.0E+00	2.7E+00	3.0E+01	2.9E+00	2.3E+00	2.7E-01	3.0E+00	2.9E+00	2.3E+00	2.7E-01	3.0E+00	2.9E+00	2.3E+00	2.7E-01	3.0E+00
Phenol	0	--	--	1.0E+04	8.6E+05	--	--	1.0E+04	8.6E+05	--	--	1.0E+03	8.6E+04	--	--	1.0E+03	8.6E+04	--	--	1.0E+03	8.6E+04
Pyrene	0	--	--	8.3E+02	4.0E+03	--	--	8.3E+02	4.0E+03	--	--	8.3E+01	4.0E+02	--	--	8.3E+01	4.0E+02	--	--	8.3E+01	4.0E+02
Radionuclides	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Gross Alpha Activity (pCi/L)	0	--	--	1.5E+01	--	--	--	1.5E+01	--	--	--	1.5E+00	--	--	--	1.5E+00	--	--	--	1.5E+00	--
Beta and Photon Activity (mrem/yr)	0	--	--	4.0E+00	--	--	--	4.0E+00	--	--	--	4.0E-01	--	--	--	4.0E-01	--	--	--	4.0E-01	--
Radium 226 + 228 (pCi/L)	0	--	--	5.0E+00	--	--	--	5.0E+00	--	--	--	5.0E-01	--	--	--	5.0E-01	--	--	--	5.0E-01	--
Uranium (ug/l)	0	--	--	3.0E+01	--	--	--	3.0E+01	--	--	--	3.0E+00	--	--	--	3.0E+00	--	--	--	3.0E+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**
Selenium, Total Recoverable	0	2.0E+01	5.0E+00	1.7E+02	4.2E+03	2.0E+01	5.0E+00	1.7E+02	4.2E+03	5.0E+00	1.3E+00	1.7E+01	4.2E+02	5.0E+00	1.3E+00	1.7E+01	4.2E+02	**5.0E+00**	**1.3E+00**	**1.7E+01**	**4.2E+02**
Silver	0	4.3E-01	--	--	--	4.3E-01	--	--	--	1.1E-01	--	--	--	1.1E-01	--	--	--	**1.1E-01**	**--**	**--**	**--**
Sulfate	0	--	--	2.5E+05	--	--	--	2.5E+05	--	--	--	2.5E+04	--	--	--	2.5E+04	--	**--**	**--**	**2.5E+04**	**--**
1,1,2,2-Tetrachloroethane[c]	0	--	--	1.7E+00	4.0E+01	--	--	1.7E+00	4.0E+01	--	--	1.7E-01	4.0E+00	--	--	1.7E-01	4.0E+00	**--**	**--**	**1.7E-01**	**4.0E+00**
Tetrachloroethylene[c]	0	--	--	6.9E+00	3.3E+01	--	--	6.9E+00	3.3E+01	--	--	6.9E-01	3.3E+00	--	--	6.9E-01	3.3E+00	**--**	**--**	**6.9E-01**	**3.3E+00**
Thallium	0	--	--	2.4E-01	4.7E-01	--	--	2.4E-01	4.7E-01	--	--	2.4E-02	4.7E-02	--	--	2.4E-02	4.7E-02	**--**	**--**	**2.4E-02**	**4.7E-02**
Toluene	0	--	--	5.1E+02	6.0E+03	--	--	5.1E+02	6.0E+03	--	--	5.1E+01	6.0E+02	--	--	5.1E+01	6.0E+02	**--**	**--**	**5.1E+01**	**6.0E+02**
Total dissolved solids	0	--	--	5.0E+05	--	--	--	5.0E+05	--	--	--	5.0E+04	--	--	--	5.0E+04	--	**--**	**--**	**5.0E+04**	**--**
Toxaphene[c]	0	7.3E-01	2.0E-04	2.8E-03	2.8E-03	7.3E-01	2.0E-04	2.8E-03	2.8E-03	1.8E-01	5.0E-05	2.8E-04	2.8E-04	1.8E-01	5.0E-05	2.8E-04	2.8E-04	**1.8E-01**	**5.0E-05**	**2.8E-04**	**2.8E-04**
Tributyltin	0	4.6E-01	7.2E-02	--	--	4.6E-01	7.2E-02	--	--	1.2E-01	1.8E-02	--	--	1.2E-01	1.8E-02	--	--	**1.2E-01**	**1.8E-02**	**--**	**--**
1,2,4-Trichlorobenzene	0	--	--	3.5E+01	7.0E+01	--	--	3.5E+01	7.0E+01	--	--	3.5E+00	7.0E+00	--	--	3.5E+00	7.0E+00	**--**	**--**	**3.5E+00**	**7.0E+00**
1,1,2-Trichloroethane[c]	0	--	--	5.9E+00	1.6E+02	--	--	5.9E+00	1.6E+02	--	--	5.9E-01	1.6E+01	--	--	5.9E-01	1.6E+01	**--**	**--**	**5.9E-01**	**1.6E+01**
Trichloroethylene[c]	0	--	--	2.5E+01	3.0E+02	--	--	2.5E+01	3.0E+02	--	--	2.5E+00	3.0E+01	--	--	2.5E+00	3.0E+01	**--**	**--**	**2.5E+00**	**3.0E+01**
2,4,6-Trichlorophenol[c]	0	--	--	1.4E+01	2.4E+01	--	--	1.4E+01	2.4E+01	--	--	1.4E+00	2.4E+00	--	--	1.4E+00	2.4E+00	**--**	**--**	**1.4E+00**	**2.4E+00**
2-(2,4,5-Trichlorophenoxy) propionic acid (Silvex)	0	--	--	5.0E+01	--	--	--	5.0E+01	--	--	--	5.0E+00	--	--	--	5.0E+00	--	**--**	**--**	**5.0E+00**	**--**
Vinyl Chloride[c]	0	--	--	2.5E-01	2.4E+01	--	--	2.5E-01	2.4E+01	--	--	2.5E-02	2.4E+00	--	--	2.5E-02	2.4E+00	**--**	**--**	**2.5E-02**	**2.4E+00**
Zinc	0	4.2E+01	4.3E+01	7.4E+03	2.6E+04	4.2E+01	4.3E+01	7.4E+03	2.6E+04	1.1E+01	1.1E+01	7.4E+02	2.6E+03	1.1E+01	1.1E+01	7.4E+02	2.6E+03	**1.1E+01**	**1.1E+01**	**7.4E+02**	**2.6E+03**

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	5.6E-01
Arsenic	1.0E+00
Barium	2.0E+02
Cadmium	6.6E-02
Chromium III	4.1E+00
Chromium VI	1.6E+00
Copper	4.3E-01
Iron	3.0E+01
Lead	4.4E-01
Manganese	5.0E+00
Mercury	1.2E-01
Nickel	1.1E+00
Selenium	7.5E-01
Silver	4.3E-02
Zinc	4.2E+00

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

5/31/2013 11:30:50 AM

Facility = Otter River ES STP - VA0020851
Chemical = Ammonia
Chronic averaging period = 30
WLAa = 10.1
WLAc =
Q.L. = 0.2
# samples/mo. = 1
# samples/wk. = 1

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 Acute Toxicity
Maximum Daily Limit = 10.1
Average Weekly limit = 10.1
Average Monthly LImit = 10.1

The data are:

9

5/31/2013 11:31:33 AM

Facility = Otter River ES STP - VA0020851
Chemical = TRC
Chronic averaging period = 4
WLAa = 19
WLAc =
Q.L. = 100
# samples/mo. = 30
# samples/wk. = 8

Summary of Statistics:

observations = 1
Expected Value = 4000
Variance = 5760000
C.V. = 0.6
97th percentile daily values = 9733.67
97th percentile 4 day average = 6655.16
97th percentile 30 day average= 4824.21
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

A limit is needed based on Acute Toxicity
Maximum Daily Limit = 19
Average Weekly limit = 11.3335966321422
Average Monthly LImit = 9.4168021134859

The data are:

4000

THIS IS A WORK IN PROGRESS UPDATING FOR WQS CHANGES jkw 1/11/01
Calculation of Waste Load Allocations using OWRM guidance memo 00-2011
This spreadsheet uses the Fractional Complete Mix calculated by the 3-95 Mixing Model

WLA Analysis For: Otter River Elementary Schc **Date:** 03/17/03

Stream: UT to Big Otter River (Int.)

Mean Hardness =	30	mg/L (Default)
Stream NH3 =	0	mg/L
90% Temperature =	24.9	C
90% pH =	8.5	SU
Fractional 7Q10 =	0	MGD (100%)
Fractional 1Q10 =	0	MGD (100%)
Harmonic mean =	0	Carcinogen
30Q5 Flow =	0	Non-carcinogen
Annual Average =	0	Dioxin only
R(iver),L(ake) or S(torm):	R	R, L, S
Trout Present?	N	Y, N
Public Water Supply:	Y	Y, N

Effluent Information

Mean Hardness =	30	mg/L
Effluent NH3 =	0	mg/L
90% Temperature =	20	C
90% pH =	7.95	SU
Original Flow =	0.005	MGD

Hardness
acute: 30
chronic: 30
7Q10 Ratio: 1
1Q10 Ratio: 1
Harmonic ratio: 1
30Q5 ratio: 1
Annual Average ratio: 1

Mix Hardness
acute: 30
chronic: 30
* WLAa
Coefficient = 0.99
Acute IWC = 1
ıronic IWC = 1

Parameter and Form	Carcinogen?	Sort? (Y/N)	Aquatic Protection Freshwater Criteria: Acute Criteria	Chronic Criteria	Human Health Criteria: PWS Criteria	Other Waters Criteria	Acute WLA	Chronic WLA	PWS WLA	Other Waters WLA
Ammonia (mg/l as N)		y	6.098	1.390	None	None	6.10	1.39	NA	NA
Chlorine		y	19	11	None	None	19.00	11.00	NA	NA

3/17/2003 9:17:08 AM

Facility = Otter River Elementary School STP
Chemical = Ammonia
Chronic averaging period = 30
WLAa = 6.1
WLAc = 1000
Q.L. = .2
# samples/mo. = 1
# samples/wk. = 1

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 Acute Toxicity
Maximum Daily Limit = 6.1
Average Weekly limit = 6.1
Average Monthly LImit = 6.1

The data are:

9