ATTACHMENT A

Flow Frequency Determination Memo

MEMORANDUM

DEPARTMENT OF ENVIRONMENTAL QUALITY
Piedmont Regional Office
4949-A Cox Road Glen Allen, Virginia 23060

SUBJECT: Flow Frequency Determination / 303(d) Status
Nottoway Motel & Restaurant – VA0028291

TO: Brad Ricks

FROM: Jennifer Palmore, P.G.

DATE: May 1, 2014

COPIES: File

The Nottoway Motel & Restaurant discharges to an unnamed tributary of the Nottoway River in Brunswick County, VA. Flow frequencies have been requested for use in developing effluent limitations for the VPDES permit.

At the discharge point, the receiving stream is shown to be a dry ditch on the USGS McKenney 7 ½' topographic quadrangle. The outfall is located at rivermile 5AXHK000.03. The flow frequencies for dry ditches and intermittent streams are listed below:

Outfall 001:

1Q30 = 0.0 cfs	High Flow 1Q10 = 0.0 cfs
1Q10 = 0.0 cfs	High Flow 7Q10 = 0.0 cfs
7Q10 = 0.0 cfs	High Flow 30Q10 = 0.0 cfs
30Q10 = 0.0 cfs	HM = 0.0 cfs
30Q5 = 0.0 cfs	

However, the discharge is located only 150 feet from the Nottoway River at rivermile 5ANTW108.83. In addition, the tributary remains on the permittee's property until the confluence, therefore the water quality standards have historically been applied at the Nottoway River.

Flow frequencies at the confluence were determined using drainage area proportion between the site and the DEQ continuous record gauge on the Nottoway River near Rawlings, VA (#02044500). The gauge has been operated from 1950 through the present. The frequencies for the reference gauge and the confluence are included below:

Nottoway River near Rawlings, VA (#02044500)
Drainage Area: 309 mi^2
High Flow Months: Jan - May
Statistical period: 1951-2003

1Q30 = 1.2 cfs	High Flow 1Q10 = 63 cfs
1Q10 = 3.4 cfs	High Flow 7Q10 = 74 cfs
7Q10 = 4.6 cfs	High Flow 30Q10 = 109 cfs
30Q10 = 11 cfs	HM = 70 cfs
30Q5 = 19 cfs	

Nottoway River at confluence with UT

Drainage Area = 362 mi^2

1Q30 = 1.4 cfs (0.91 MGD)	High Flow 1Q10 = 74 cfs (48 MGD)
1Q10 = 4.0 cfs (2.6 MGD)	High Flow 7Q10 = 87 cfs (56 MGD)
7Q10 = 5.4 cfs (3.5 MGD)	High Flow 30Q10 = 128 cfs (83 MGD)
30Q10 = 13 cfs (8.3 MGD)	HM = 82 cfs (53 MGD)
30Q5 = 22 cfs (14 MGD)	

This analysis assumes that there are no other significant discharges or withdrawals influencing the flow in the Nottoway River between the gauge and the discharge.

During the 2012 305(b)/303(d) Integrated Water Quality Assessment Report, the unnamed tributary was not assessed for any of its designated uses and was therefore considered a Category 3A water. The Nottoway River was assessed as a Category 5A water ("A Water Quality Standard is not attained. The water is impaired or threatened for one or more designated uses by a pollutant(s) and requires a TMDL (303d list).") The applicable fact sheet is attached. The Recreation Use is impaired due to E.coli violations at the Route 1 bridge. The segment was considered fully supporting of the Aquatic Life Use and was not assessed for the Fish Consumption- or Wildlife Uses.

Water quality data from monitoring station 5ANTW109.02 is attached. The station is located at the Route 1 bridge approximately 0.19 mile upstream of the discharge.

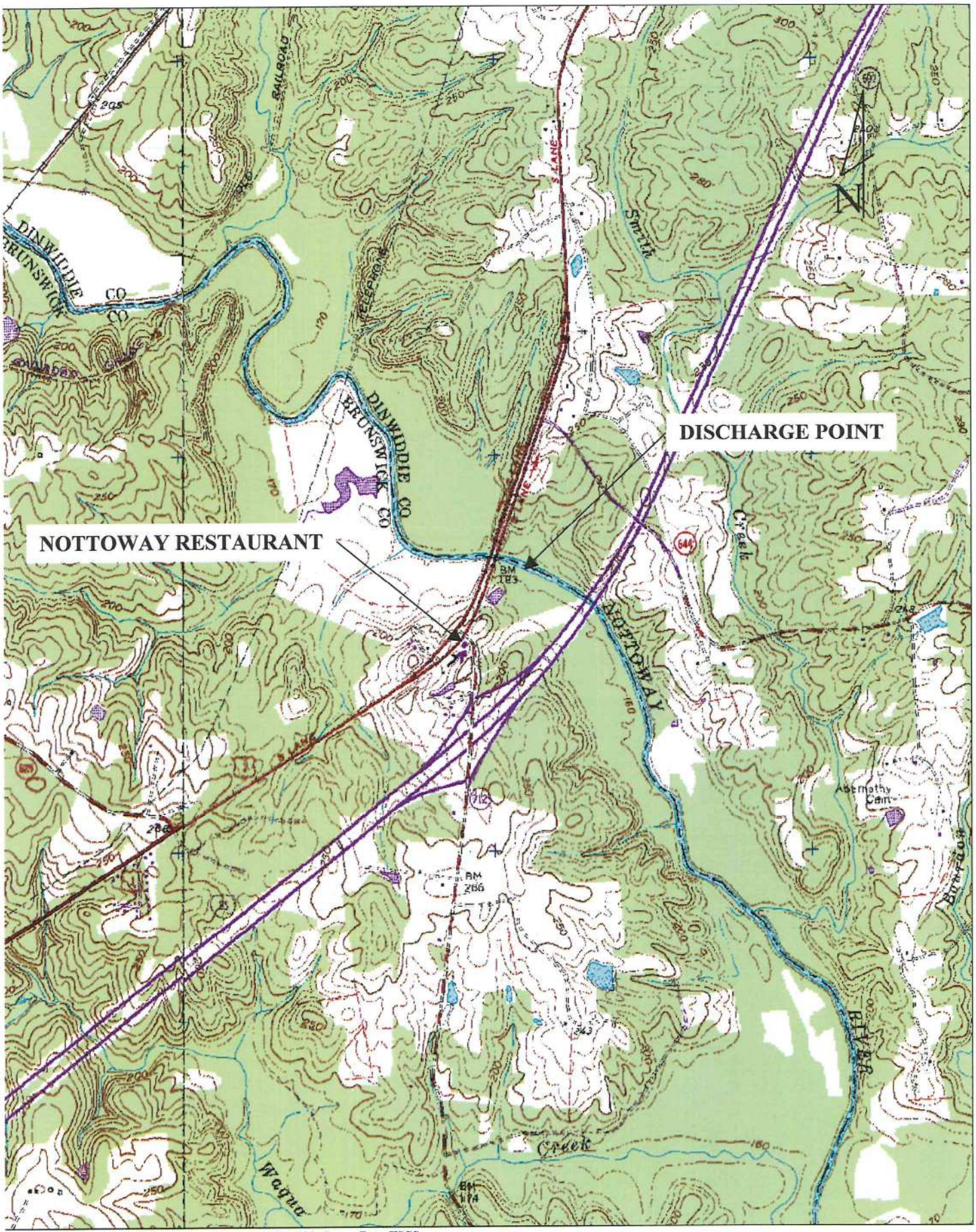
Due to the ephemeral nature of the tributary, the receiving stream is considered a Tier 1 water. However, the Nottoway River is considered a Tier 2 water. As stated above, the segment was assessed as fully supporting of the Aquatic Life Use. In addition, monitoring data shows the water is consistently better than the appropriate Water Quality Standards.

The discharge is not currently included in any approved TMDL.

If you have any questions concerning this analysis, please let me know.

ATTACHMENT B

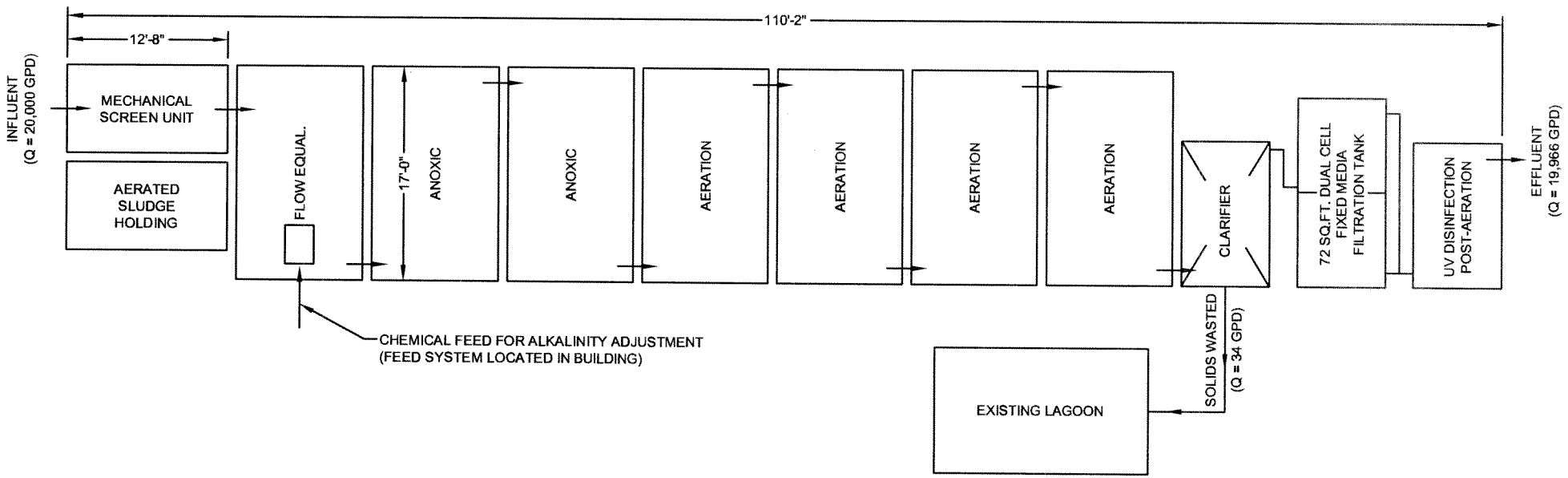
Site Diagram and Location Map



) TopoQuads Copyright © 1999 DeLorme Yarmouth, ME 04096 Source Data: USGS

693 ft Scale: 1 : 24,000 Detail: 13-1 Datum: WGS84

PLANT BLOWERS - 140 CFM @ 6 PSI
ROOTS URAI-36 & 7.5 HP. MOTORS
FLOW EQ. BLOWER - 31 CFM @ 5 PSI
ROOTS URAI - 24 & 2 HP. MOTOR



FEBURARY 25, 2014

PREPARED BY:

B & B Consultants, Inc.
Engineers - Architects - Surveyors
Planners - Lab Analysts
South Hill, Chase City, & South Boston, Virginia

SITE LAYOUT - 20,000 GPD WWTP

NOTTOWAY MOTEL & RESTAURANT WWTP
WARFIELD, VA

ATTACHMENT C

Ambient Monitoring Data

Station ID	Collection Date	Depth Desc	Depth	Temp Celcius	Field Ph	Do Probe	Do Winkler	Fdt Do Optical
5ANTW109.02	1/26/1968	S	0.3	26.11	7.8		6	
5ANTW109.02	8/2/1968	S	0.3	28.33	8.2		8	
5ANTW109.02	9/16/1968	S	0.3	21.11	7.5		8	
5ANTW109.02	9/30/1968	S	0.3	22.22	7		8.5	
5ANTW109.02	4/7/1969	S	0.3	14.44			9.3	
5ANTW109.02	6/10/1969	S	0.3	22.22	7.2		7.5	
5ANTW109.02	9/28/1969	S	0.3	18.89	7.3		8.1	
5ANTW109.02	3/11/1970	S	0.3	11.11	6.8		11.29	
5ANTW109.02	4/16/1970	S	0.3	13.33	7		10	
5ANTW109.02	5/12/1970	S	0.3	21.67	7		7.8	
5ANTW109.02	6/18/1970	S	0.3	27.78	7.7		7.8	
5ANTW109.02	6/30/1970	S	0.3	24.44	6.8		8.4	
5ANTW109.02	8/31/1970	S	0.3	26.67	7.5		7.4	
5ANTW109.02	10/1/1970	S	0.3	18.33	7		8.8	
5ANTW109.02	11/9/1970	S	0.3	12.22	7.2		11	
5ANTW109.02	12/6/1970	S	0.3	5.56	7		12.19	
5ANTW109.02	1/11/1971	S	0.3	-1.66	6.9		13.19	
5ANTW109.02	2/3/1971	S	0.3	0.56	7.5		14	
5ANTW109.02	3/21/1971	S	0.3	10	7.3		12.39	
5ANTW109.02	4/26/1971	S	0.3	17.78	7.2		10.39	
5ANTW109.02	5/5/1971	S	0.3	17.78	7.5		9.6	
5ANTW109.02	6/9/1971	S	0.3	25.56	6.8		7	
5ANTW109.02	7/25/1971	S	0.3	23.89	6.8		8.4	
5ANTW109.02	8/16/1971	S	0.3	25.56	7.2		7.2	
5ANTW109.02	9/22/1971	S	0.3	20	7		6.8	
5ANTW109.02	11/8/1971	S	0.3	11.11	7.2		11	
5ANTW109.02	12/2/1971	S	0.3	4.44	7		10	
5ANTW109.02	1/18/1972	S	0.3	2.22	7.1		13.19	
5ANTW109.02	2/8/1972	S	0.3	2.22	6.9		14	
5ANTW109.02	3/28/1972	S	0.3	7.78	6.7		10	
5ANTW109.02	4/13/1972	S	0.3	13.33	6.7		10	
5ANTW109.02	5/3/1972	S	0.3	20.56	7		8	
5ANTW109.02	5/31/1972	S	0.3	22.22	7.3		8	
5ANTW109.02	7/12/1972	S	0.3	22.78	6.7		7.4	
5ANTW109.02	8/3/1972	S	0.3	25.56	7		7.8	
5ANTW109.02	9/11/1972	S	0.3	24.44	7		7.8	
5ANTW109.02	10/5/1972	S	0.3	18.33	6.6		8.4	
5ANTW109.02	11/13/1972	S	0.3	11.11	6.7		11.59	
5ANTW109.02	12/18/1972	S	0.3	6.67	7		9	
5ANTW109.02	1/4/1973	S	0.3	8.89	6.8		10.59	
5ANTW109.02	2/15/1973	S	0.3	5.56	7.2		12.59	
5ANTW109.02	3/15/1973	S	0.3	17.78	6.8		9.8	
5ANTW109.02	4/17/1973	S	0.3	15.56	7		10	
5ANTW109.02	5/28/1973	S	0.3	20	7.2		8	
5ANTW109.02	6/17/1973	S	0.3	27.22	7.3		6.8	
5ANTW109.02	7/28/1973	S	0.3	26.67	7.3		7	
5ANTW109.02	8/23/1973	S	0.3	25.56	7		7	
5ANTW109.02	10/5/1973	S	0.3	20.56	7.1		7.4	
5ANTW109.02	11/12/1973	S	0.3	7.22	6.8		11.39	
5ANTW109.02	11/30/1973	S	0.3	14.44	7		11.19	
5ANTW109.02	1/29/1974	S	0.3	11.67	7		9.8	
5ANTW109.02	2/27/1974	S	0.3	5.56	7.2		11.19	
5ANTW109.02	3/15/1974	S	0.3	7.22	7		10.59	
5ANTW109.02	4/1/1974	S	0.3	12.22	7		9.4	
5ANTW109.02	5/7/1974	S	0.3	16.67	7		9	
5ANTW109.02	6/29/1974	S	0.3	19.44	7		18	
5ANTW109.02	7/7/1974	S	0.3	25.56	7		7.8	
5ANTW109.02	8/6/1974	S	0.3	24.44	7.2		8	

Station ID	Collection Date	Depth Desc	Depth	Temp Celcius	Field Ph	Do Probe	Do Winkler	Fdt Do Optical
5ANTW109.02	9/11/1974	S	0.3	22.22	6.5		7.6	
5ANTW109.02	10/21/1974	S	0.3	9.44	7.8			
5ANTW109.02	11/21/1974	S	0.3	7.22	7		11	
5ANTW109.02	12/8/1974	S	0.3	6.67	6.5		12.39	
5ANTW109.02	2/4/1975	S	0.3	4.44	7		12.59	
5ANTW109.02	3/14/1975	S	0.3	4.44	7.1		11	
5ANTW109.02	4/14/1975	S	0.3	12.22	7			
5ANTW109.02	5/27/1975	S	0.3	26.11	7		7.6	
5ANTW109.02	6/16/1975	S	0.3	24.44	7.3		7.2	
5ANTW109.02	7/9/1975	S	0.3	24.44	7		7.6	
5ANTW109.02	8/19/1975	S	0.3	25.56	7.3			
5ANTW109.02	9/1/1975	S	0.3	25.56	7		8	
5ANTW109.02	10/15/1975	S	0.3	20	7		8.8	
5ANTW109.02	11/19/1975	S	0.3	11.11	7		11.19	
5ANTW109.02	12/1/1975	S	0.3	11.11	7		11.19	
5ANTW109.02	3/23/1976	S	0.3	11.67	7.3		11.39	
5ANTW109.02	5/25/1976	S	0.3	18			7.4	
5ANTW109.02	6/11/1976	S	0.3	23.89			7.2	
5ANTW109.02	7/12/1976	S	0.3	26.67	7.5		7	
5ANTW109.02	8/12/1976	S	0.3	24.44	7.8		7.4	
5ANTW109.02	11/4/1976	S	0.3	9.44	7.5		10.59	
5ANTW109.02	1/7/1977	S	0.3	2.1	7.5		7.2	
5ANTW109.02	3/30/1977	S	0.3	18	7.5		7.7	
5ANTW109.02	4/21/1977	S	0.3	20	7.5		7.2	
5ANTW109.02	6/7/1977	S	0.3	2.1	7.5		7.2	
5ANTW109.02	7/19/1977	S	0.3	2.7	7.7		6.4	
5ANTW109.02	8/10/1977	S	0.3	27	7.3		5	
5ANTW109.02	10/14/1977	S	0.3	1.4	7.4		11.19	
5ANTW109.02	11/9/1977	S	0.3	2	6.7		6.3	
5ANTW109.02	1/31/1978	S	0.3	1.5	7.3		12.79	
5ANTW109.02	4/24/1978	S	0.3	16	7.5		9	
5ANTW109.02	6/13/1978	S	0.3	23	7.5		7.8	
5ANTW109.02	7/5/1978	S	0.3	4	7.6		11.6	
5ANTW109.02	8/9/1978	S	0.3	27	7		7.1	
5ANTW109.02	8/31/1978	S	0.3	28	7.5		7.4	
5ANTW109.02	10/23/1978	S	0.3	14	7.5		9	
5ANTW109.02	1/16/1979	S	0.3	2	7.5		12.8	
5ANTW109.02	4/11/1979	S	0.3	12	7		11.2	
5ANTW109.02	6/20/1979	S	0.3	23	7.4		7.6	
5ANTW109.02	8/7/1979	S	0.3	27	7		8.2	
5ANTW109.02	9/13/1979	S	0.3	18.5	7		8.5	
5ANTW109.02	10/11/1979	S	0.3	13.5	7		9.4	
5ANTW109.02	11/8/1979	S	0.3	9	7			
5ANTW109.02	12/3/1979	S	0.3	3	6.7		11	
5ANTW109.02	1/3/1980	S	0.3	4	7		11.4	
5ANTW109.02	2/11/1980	S	0.3	2	7		11	
5ANTW109.02	3/24/1980	S	0.3	12.5	7.4		9.5	
5ANTW109.02	4/17/1980	S	0.3	14.5	6.5		9.6	
5ANTW109.02	5/15/1980	S	0.3	19	7.3		7.8	
5ANTW109.02	6/19/1980	S	0.3	24	7.4		7.9	
5ANTW109.02	7/17/1980	S	0.3	31.5	7.5		6.8	
5ANTW109.02	11/6/1980	S	0.3	10.5	7.5		9.8	
5ANTW109.02	12/4/1980	S	0.3		7			
5ANTW109.02	2/3/1981	S	0.3	3	7.1		14.4	
5ANTW109.02	3/3/1981	S	0.3	9	8		10.7	
5ANTW109.02	4/1/1981	S	0.3	13	7.5		9.8	
5ANTW109.02	5/28/1981	S	0.3	19.5	7.3		8.5	
5ANTW109.02	6/25/1981	S	0.3	29.5	7.5		6.8	

Station ID	Collection Date	Depth Desc	Depth	Temp Celcius	Field Ph	Do Probe	Do Winkler	Fdt Do Optical
5ANTW109.02	7/23/1981	S	0.3	25.5	7.5		7.1	
5ANTW109.02	8/25/1981	S	0.3	25	7.3		7	
5ANTW109.02	9/9/1981	S	0.3	23.5	7.5		7.5	
5ANTW109.02	10/21/1981	S	0.3	12.5	7		7	
5ANTW109.02	12/15/1981	S	0.3	2	6.5		7.6	
5ANTW109.02	2/24/1982	S	0.3	8	7		9	
5ANTW109.02	3/10/1982	S	0.3	7	6.7		9.7	
5ANTW109.02	4/27/1982	S	0.3	17	7.5		8.2	
5ANTW109.02	5/11/1982	S	0.3	21	7		7.1	
5ANTW109.02	6/16/1982	S	0.3	21.5	7.2		6.8	
5ANTW109.02	7/15/1982	S	0.3	22.5	6.5		5.9	
5ANTW109.02	8/11/1982	S	0.3	24	6.8		5.8	
5ANTW109.02	9/20/1982	S	0.3	22.5	7.3		8.2	
5ANTW109.02	10/13/1982	S	0.3	18	7		8.1	
5ANTW109.02	11/9/1982	S	0.3	11	6.3		9.2	
5ANTW109.02	12/8/1982	S	0.3	10	6.7		10.3	
5ANTW109.02	1/11/1983	S	0.3	7	6.7		11.6	
5ANTW109.02	2/18/1983	S	0.3	4	6.5		12	
5ANTW109.02	3/24/1983	S	0.3	8	6.5		11.4	
5ANTW109.02	4/26/1983	S	0.3	14.5	6.5		10.1	
5ANTW109.02	5/24/1983	S	0.3	21	7		8.3	
5ANTW109.02	6/30/1983	S	0.3	24	7.3		8	
5ANTW109.02	7/19/1983	S	0.3	28.5	7.3		7.5	
5ANTW109.02	8/24/1983	S	0.3	28	7.4		7.2	
5ANTW109.02	11/22/1983	S	0.3	12.5	6.7		10.9	
5ANTW109.02	12/15/1983	S	0.3	10	7.9		11.2	
5ANTW109.02	1/26/1984	S	0.3	3	6.7		14	
5ANTW109.02	2/2/1984	S	0.3	4	6.8		12.8	
5ANTW109.02	3/21/1984	S	0.3	13	6.5		11	
5ANTW109.02	4/25/1984	S	0.3	14	7		10.6	
5ANTW109.02	5/14/1984	S	0.3	20	7		8.7	
5ANTW109.02	6/11/1984	S	0.3	28.5	7.1		7.6	
5ANTW109.02	7/9/1984	S	0.3	25	7.2		10.4	
5ANTW109.02	8/13/1984	S	0.3	27	6.75		7.7	
5ANTW109.02	9/9/1984	S	0.3	22	6.82		9.5	
5ANTW109.02	10/15/1984	S	0.3	16.5	5.88		9	
5ANTW109.02	12/27/1984	S	0.3	7	6.9		11.7	
5ANTW109.02	1/16/1985	S	0.3	1.7	6		14.1	
5ANTW109.02	2/13/1985	S	0.3	3.6	6.2		13.6	
5ANTW109.02	3/19/1985	S	0.3	7	6.6		13.1	
5ANTW109.02	4/16/1985	S	0.3	19	6.5		9.7	
5ANTW109.02	5/21/1985	S	0.3	24.5	7.3			
5ANTW109.02	6/18/1985	S	0.3	25	7.4		7.6	
5ANTW109.02	7/16/1985	S	0.3	29	7		6.7	
5ANTW109.02	8/13/1985	S	0.3	29	7.1		7.4	
5ANTW109.02	9/10/1985	S	0.3	28	6.7		7.6	
5ANTW109.02	11/25/1985	S	0.3	11.5	7.03		10.3	
5ANTW109.02	12/18/1985	S	0.3	5.5	7.2		11.5	
5ANTW109.02	1/30/1986	S	0.3	2	7		12.7	
5ANTW109.02	2/26/1986	S	0.3	5.6	7.97		12.8	
5ANTW109.02	3/20/1986	S	0.3	12	7		9.7	
5ANTW109.02	4/22/1986	S	0.3	16	7.55		9	
5ANTW109.02	5/21/1986	S	0.3	21.3			8	
5ANTW109.02	6/16/1986	S	0.3	27	7.77		8	
5ANTW109.02	7/14/1986	S	0.3	30	7.96		5.3	
5ANTW109.02	8/4/1986	S	0.3	27.1	8.21		7.9	
5ANTW109.02	10/9/1986	S	0.3	20	7.58		7.5	
5ANTW109.02	11/13/1986	S	0.3		7.96		10	

Station ID	Collection Date	Depth Desc	Depth	Temp Celcius	Field Ph	Do Probe	Do Winkler	Fdt Do Optical
5ANTW109.02	12/3/1986	S	0.3	12	7.81		9.5	
5ANTW109.02	1/13/1987	S	0.3	6	7.34		12.1	
5ANTW109.02	2/24/1987	S	0.3	3	7.21		12.9	
5ANTW109.02	3/30/1987	S	0.3	15.4	7.96		9.2	
5ANTW109.02	4/21/1987	S	0.3	16.4	7.01		8.5	
5ANTW109.02	5/28/1987	S	0.3					
5ANTW109.02	6/25/1987	S	0.3	24	7.68		6.92	
5ANTW109.02	6/25/1987	S	0.3	24	7.68		6.92	
5ANTW109.02	7/21/1987	S	0.3	29.5	7.75		7.3	
5ANTW109.02	8/5/1987	S	0.3	28	7.1		4.5	
5ANTW109.02	8/5/1987	S	0.3	28	7.1		4.5	
5ANTW109.02	9/1/1987	S	0.3	25.2	7.68		8	
5ANTW109.02	10/5/1987	S	0.3	16.8	7.69		9.4	
5ANTW109.02	11/30/1987	S	0.3	9.5	7.6		10.7	
5ANTW109.02	1/4/1988	S	0.3	4.5	7.97		13	
5ANTW109.02	2/23/1988	S	0.3	9			10.7	
5ANTW109.02	2/23/1988	B	1	9			10.7	
5ANTW109.02	3/17/1988	S	0.3	9.2	7.76		11	
5ANTW109.02	4/27/1988	S	0.3	18.6	7.75		9	
5ANTW109.02	5/24/1988	S	0.3	24.2	7.2		7.5	
5ANTW109.02	6/7/1988	S	0.3	25			5.9	
5ANTW109.02	7/6/1988	S	0.3	25			5.9	
5ANTW109.02	7/11/1988	S	0.3	27	7.56		7.9	
5ANTW109.02	8/11/1988	S	0.3	26.4	7.69		7.3	
5ANTW109.02	9/26/1988	S	0.3	20	7.56		8.7	
5ANTW109.02	10/19/1988	S	0.3	11.8	7.82		10.2	
5ANTW109.02	11/2/1988	S	0.3	7.5	7.16		11.6	
5ANTW109.02	12/6/1988	S	0.3	2.6	7.4		14.3	
5ANTW109.02	1/19/1989	S	0.3					
5ANTW109.02	3/14/1989	S	0.3					
5ANTW109.02	4/17/1989	S	0.3	15.4	7.52		10.8	
5ANTW109.02	5/11/1989	S	0.3	15.2	7.22		9.7	
5ANTW109.02	6/14/1989	S	0.3	25.3	7.04		7.8	
5ANTW109.02	7/17/1989	S	0.3	23.6	7.3		7.4	
5ANTW109.02	8/9/1989	S	0.3	25.1	7.73		7.7	
5ANTW109.02	9/13/1989	S	0.3	26	7.2		7.4	
5ANTW109.02	10/12/1989	S	0.3	15.8	7.68		10	
5ANTW109.02	11/14/1989	S	0.3	13.9	7.58		9.9	
5ANTW109.02	12/27/1989	S	0.3	0	7.78		15	
5ANTW109.02	1/8/1990	S	0.3	4.6	8.55		13.3	
5ANTW109.02	2/1/1990	S	0.3	7.3	7.52		12.9	
5ANTW109.02	3/6/1990	S	0.3	8.2	7.67		13.5	
5ANTW109.02	4/2/1990	S	0.3	14.6	7.46		10.9	
5ANTW109.02	5/1/1990	S	0.3	21.1	7.35		9	
5ANTW109.02	6/5/1990	B	0.3	20.8	7.82		8.3	
5ANTW109.02	7/16/1990	S	0.3	27.1	7.07		6.9	
5ANTW109.02	8/13/1990	S	0.3	26.1	7.79			
5ANTW109.02	9/13/1990	S	0.3	23.2	6.68		7.4	
5ANTW109.02	10/11/1990	S	0.3	21.79	7.19	7.1		
5ANTW109.02	11/27/1990	S	0.3	10.9	6.89	11	11.3	
5ANTW109.02	12/5/1990	S	0.3	8.8	7.02	11.24	11.2	
5ANTW109.02	12/5/1990	B	0.3	8.75	7.02	11.24		
5ANTW109.02	2/12/1991	S	0.09	6.55	7.4	12.5	12.5	
5ANTW109.02	3/28/1991	B	0.3	17.79	6.73	9.28		
5ANTW109.02	3/28/1991	S	0.09			9.28		
5ANTW109.02	4/29/1991	S	0.09	19.56	6.51	8.63	8.6	
5ANTW109.02	5/23/1991	S	0.3	23.32	7.1		7.73	
5ANTW109.02	6/19/1991	S	0.3	24.27	6.45		7.49	

Station ID	Collection Date	Depth Desc	Depth	Temp Celcius	Field Ph	Do Probe	Do Winkler	Fdt Do Optical
5ANTW109.02	7/22/1991	S	0.3	32.16	7.26		7.62	
5ANTW109.02	8/20/1991	S	0.3	26.09	6.75	6.9		
5ANTW109.02	9/19/1991	S	0.3	26.94	6.68	6.68		
5ANTW109.02	10/21/1991	S	0.3	13.49	6.68	9.76		
5ANTW109.02	11/25/1991	S	0.3	10.57	7.04	10.13		
5ANTW109.02	12/19/1991	S	0.3	3.32	7	13.64		
5ANTW109.02	1/16/1992	S	0.3	4.16	6.37	12.33		
5ANTW109.02	2/25/1992	S	0.3	9.72	6.66	11.33		
5ANTW109.02	3/18/1992	S	0.3	10.81	6	10.71		
5ANTW109.02	5/20/1992	S	0.3	20.5	6.6	7.91		
5ANTW109.02	6/22/1992	S	0.3	21.71	6.52	8.24		
5ANTW109.02	7/13/1992	S	0.3	30.17	5.26	7.01		
5ANTW109.02	8/20/1992	S	0.3	23.97	6.56	7.1		
5ANTW109.02	9/21/1992	S	0.3	22.99	7.11	7.66		
5ANTW109.02	10/20/1992	S	0.3	11.18	6.9	10.17		
5ANTW109.02	11/12/1992	S	0.3	11.11	7.17	9.97		
5ANTW109.02	12/8/1992	S	0.3	4.59	7.17	12.28		
5ANTW109.02	1/19/1993	S	0.3	5.93	6.85	12.64		
5ANTW109.02	2/17/1993	S	0.3	7.26	6.86	12.07		
5ANTW109.02	3/16/1993	S	0.3	4.08	6.21	12.78		
5ANTW109.02	4/14/1993	S	0.3	15.05	6.4	9.47		
5ANTW109.02	5/17/1993	S	0.3	23.23	6.7	7.45		
5ANTW109.02	6/9/1993	S	0.3	24.91	6.56	7.3		
5ANTW109.02	7/14/1993	S	0.3	29.83	6.75	6.38		
5ANTW109.02	8/11/1993	S	0.3	25.42	6.91	7.73		
5ANTW109.02	9/23/1993	S	0.3	22.83	7.51	7.87		
5ANTW109.02	10/21/1993	S	0.3	20.25	7.22	7.65		
5ANTW109.02	11/15/1993	S	0.3	16.23	7.05	8.8		
5ANTW109.02	12/15/1993	S	0.3	4.85	6.81	12.26		
5ANTW109.02	1/25/1994	S	0.3	2.09	6.7	13.08		
5ANTW109.02	2/16/1994	S	0.3	4.46	6.62	12.85		
5ANTW109.02	3/14/1994	S	0.3	10.41	6.56	10.91		
5ANTW109.02	4/13/1994	S	0.3	18.21	6.73	8.84		
5ANTW109.02	5/12/1994	S	0.3	19.43	6.78	8.47		
5ANTW109.02	6/13/1994	S	0.3	23.69	6.9	7.91		
5ANTW109.02	7/13/1994	S	0.3	25.7	7.07	6.83		
5ANTW109.02	8/25/1994	S	0.3	21.38	6.99	7.66		
5ANTW109.02	9/19/1994	S	0.3	22.61	7.22	7.73		
5ANTW109.02	10/19/1994	S	0.3	11.95	6.92	9.53		
5ANTW109.02	11/7/1994	S	0.3	13.41	6.96	8.95		
5ANTW109.02	12/12/1994	S	0.3	7.19	7.07	11.23		
5ANTW109.02	1/11/1995	S	0.3	3.77	6.79	12.76		
5ANTW109.02	2/24/1995	S	0.3	6.18	6.92	11.72		
5ANTW109.02	3/20/1995	S	0.3	10.34	6.92	10.56		
5ANTW109.02	4/24/1995	S	0.3	14.94	6.97	8.42		
5ANTW109.02	5/22/1995	S	0.3	20.3	6.81	7.51		
5ANTW109.02	6/26/1995	S	0.3	25	6.86	6.57		
5ANTW109.02	7/26/1995	S	0.3	27.12	6.86	6.14		
5ANTW109.02	8/24/1995	S	0.3	22.86	7.1	6.62		
5ANTW109.02	9/26/1995	S	0.3	17.78	7.14	7.22		
5ANTW109.02	10/30/1995	S	0.3	13.6	6.49	9.19		
5ANTW109.02	11/28/1995	S	0.3	7.57	6.86	12.22		
5ANTW109.02	12/20/1995	S	0.3	3.83	6.95	12.32		
5ANTW109.02	1/23/1996	S	0.3	2.21	6.15	13.04		
5ANTW109.02	2/22/1996	S	0.3	6.46	6.31	11.53		
5ANTW109.02	3/26/1996	S	0.3	12.12	6.82	9.82		
5ANTW109.02	4/16/1996	S	0.3	16.57	6.69	9.58		
5ANTW109.02	5/7/1996	S	0.3	20.21	6.71	7.56		

Station ID	Collection Date	Depth Desc	Depth	Temp Celcius	Field Ph	Do Probe	Do Winkler	Fdt Do Optical
5ANTW109.02	6/5/1996	S	0.3	20.66	7.12	8.78		
5ANTW109.02	7/8/1996	S	0.3	25.35	7.18	7.73		
5ANTW109.02	8/8/1996	S	0.3	24.52	6.88	7.08		
5ANTW109.02	9/5/1996	S	0.3	23.64	6.77	7.43		
5ANTW109.02	10/2/1996	S	0.3	19.02	6.81	8.87		
5ANTW109.02	11/6/1996	S	0.3	12.4	6.67	10.17		
5ANTW109.02	12/2/1996	S	0.3	8.63	6.31	10.58		
5ANTW109.02	1/6/1997	S	0.3	10.51	6.53	10.75		
5ANTW109.02	2/3/1997	S	0.3	5.65	6.88	11.64		
5ANTW109.02	3/24/1997	S	0.3	10.27	6.77	10.68		
5ANTW109.02	4/15/1997	S	0.3	13.61	7.06	9.77		
5ANTW109.02	5/7/1997	S	0.3	16.8	6.69	8.92		
5ANTW109.02	6/10/1997	S	0.3	16.99	6.61	9.2		
5ANTW109.02	8/12/1997	S	0.3	23.51	7	7.68		
5ANTW109.02	9/18/1997	S	0.3	21.8	7.07	7.45		
5ANTW109.02	10/16/1997	S	0.3	15.56	7.11	8.72		
5ANTW109.02	11/24/1997	S	0.3	7.63	6.76	11.36		
5ANTW109.02	12/17/1997	S	0.3	4.01	7.12	13.06		
5ANTW109.02	1/28/1998	S	0.3	5.89	6.51	11.47		
5ANTW109.02	2/23/1998	S	0.3	8.8	6.52	11.2		
5ANTW109.02	3/25/1998	S	0.3	8.93	6.44	11.38		
5ANTW109.02	4/21/1998	S	0.3	15.11	6.81	9.24		
5ANTW109.02	5/21/1998	S	0.3	21.91	6.91	7.54		
5ANTW109.02	6/24/1998	S	0.3	24.24	6.64	6.88		
5ANTW109.02	7/30/1998	S	0.3	24.62	6.82	6.7		
5ANTW109.02	8/25/1998	S	0.3	24.82	6.97	6.88		
5ANTW109.02	9/24/1998	S	0.3	18.8	7.02	7.8		
5ANTW109.02	10/29/1998	S	0.3	13.48	6.92	9.33		
5ANTW109.02	11/19/1998	S	0.3	8.24	6.65	10.06		
5ANTW109.02	12/17/1998	S	0.3	5.86	6.78	11.52		
5ANTW109.02	1/21/1999	S	0.3	6.3	6.38	11.5		
5ANTW109.02	2/17/1999	S	0.3	6.86	6.65	11.3		
5ANTW109.02	3/10/1999	S	0.3	5.49	6.95	12.61		
5ANTW109.02	4/22/1999	S	0.3	15.03	6.5	9.25		
5ANTW109.02	5/19/1999	S	0.3	18.08	6.74	7.87		
5ANTW109.02	6/16/1999	S	0.3	22.78	6.87	7.61		
5ANTW109.02	8/16/1999	S	0.3	24.42	6.86	6.89		
5ANTW109.02	9/15/1999	S	0.3	21.63	6.61	7.44		
5ANTW109.02	10/21/1999	S	0.3	14.15	6.36	9.98		
5ANTW109.02	11/3/1999	S	0.3	13.23	6.53	9.09		
5ANTW109.02	12/27/1999	S	0.3	3.34	6.64	13.01		
5ANTW109.02	1/19/2000	S	0.3	2.2	6.5	13.08		
5ANTW109.02	2/14/2000	S	0.3	6.46	6.69	12.23		
5ANTW109.02	3/8/2000	S	0.3	11.53	6.73	10.33		
5ANTW109.02	4/17/2000	S	0.3	17.34	6.81	8.74		
5ANTW109.02	5/8/2000	S	0.3	21.72	6.58	7.83	7.2	
5ANTW109.02	6/1/2000	S	0.3	18.23	6.83	8.45		
5ANTW109.02	6/29/2000	S	0.3	24.62	6.66	6.91	7	
5ANTW109.02	8/15/2000	S	0.3	22.22	6.74	7.23	7.4	
5ANTW109.02	9/6/2000	S	0.3	20.85	6.6	7.75		
5ANTW109.02	9/28/2000	S	0.3	17.16	6.66	8.81	8.8	
5ANTW109.02	12/11/2000	S	0.3	3.22	6.36	12.32		
5ANTW109.02	2/26/2001	S	0.3	8.57	7.21	11.9		
5ANTW109.02	5/22/2001	S	0.3	20.22	6.72	7.65		
5ANTW109.02	7/26/2001	S	0.3	24.95	6.75	6.49		
5ANTW109.02	9/24/2001	S	0.3	20.32	6.94	7.64		
5ANTW109.02	11/14/2001	S	0.3	8.43	6.91	12.78		
5ANTW109.02	1/28/2002	S	0.3	8.56	7	11.86		

Station ID	Collection Date	Depth Desc	Depth	Temp Celcius	Field Ph	Do Probe	Do Winkler	Fdt Do Optical
5ANTW109.02	3/18/2002	S	0.3	11.54	7.01	9.91		
5ANTW109.02	5/7/2002	S	0.3	18.5	6.76	8.38		
5ANTW109.02	8/22/2002	S	0.3	25.41	7.05	5.55		
5ANTW109.02	10/29/2002	S	0.3	22.7	6.5	9.39		
5ANTW109.02	12/11/2002	S	0.3	2.73	7.24	13.25		
5ANTW109.02	2/12/2003	S	0.3	3.96	6.86	13.34		
5ANTW109.02	4/22/2003	S	0.3	15.58	6.73	10.54		
5ANTW109.02	6/3/2003	S	0.3	18.55	6.63	9.04		
5ANTW109.02	8/18/2003	S	0.3	25.62	6.92	7.12		
5ANTW109.02	10/9/2003	S	0.3	18.11	6.8	8.79		
5ANTW109.02	12/22/2003	S	0.3	3.46	6.45	13.57		
5ANTW109.02	3/1/2004	S	0.3	11.44	6.19	10.3		
5ANTW109.02	4/26/2004	S	0.3	20.77	7.04	8.17		
5ANTW109.02	6/3/2004	S	0.3	23.15	6.87	7.26		
5ANTW109.02	7/29/2004	S	0.3	25.54	6.95	6.98		
5ANTW109.02	10/5/2004	S	0.3	19.12	7.06	8.19		
5ANTW109.02	11/18/2004	S	0.3	9.19	7.18	10.9		
5ANTW109.02	1/11/2005	S	0.3	8.54	7.07	11.15		
5ANTW109.02	3/24/2005	S	0.3	10.51	6.51	10.52		
5ANTW109.02	5/23/2005	S	0.3	19.69	6.98	7.93		
5ANTW109.02	7/12/2005	S	0.3	25.53	6.86	6.77		
5ANTW109.02	9/27/2005	S	0.3	22.58	7.38	7		
5ANTW109.02	11/21/2005	S	0.3	8.75	7.11	11.2		
5ANTW109.02	1/25/2006	S	0.3	7.23	6.83	11.52		
5ANTW109.02	3/9/2006	S	0.3	7.7	7.5	12.1		
5ANTW109.02	5/23/2006	S	0.3	19	6.5	8.7		
5ANTW109.02	7/24/2006	S	0.3	24.9	7.3	7.3		
5ANTW109.02	9/20/2006	S	0.3	21.1	7.1	8		
5ANTW109.02	11/30/2006	S	0.3	10.4	6.5	11.2		
5ANTW109.02	2/8/2007	S	0.3	2.5	6.8	13		
5ANTW109.02	4/17/2007	S	0.3	11.9	6.2	10.5		
5ANTW109.02	6/21/2007	S	0.3	23.9	6.4	7.1		
5ANTW109.02	7/31/2007	S	0.3	23.7	7.1	7.4		
5ANTW109.02	10/29/2007	S	0.3	15	7.3	9.4		
5ANTW109.02	12/27/2007	S	0.3	5.6	6.6	12.6		
5ANTW109.02	2/7/2008	S	0.3	10.7	7.5			10.7
5ANTW109.02	4/14/2008	S	0.3	15.5	7.3	9.5		
5ANTW109.02	6/5/2008	S	0.3	24.4	7.2	7		
5ANTW109.02	8/11/2008	S	0.3	22.4	7.3	6.4		
5ANTW109.02	10/2/2008	S	0.3	18	5.8	8.7		
5ANTW109.02	12/8/2008	S	0.3	2.6	7.1	13.8		
5ANTW109.02	1/14/2009	S	0.3	3.8	6.9	13.2		
5ANTW109.02	3/4/2009	S	0.3	2.3	6.8	13.8		
5ANTW109.02	5/6/2009	S	0.3	18.3	7.1	8.6		
5ANTW109.02	7/8/2009	S	0.3	23.1	7.2	7.3		
5ANTW109.02	9/21/2009	S	0.3	19.1	7.3	8		
5ANTW109.02	11/16/2009	S	0.3	11.4	6.2	10.6		
5ANTW109.02	2/4/2010	S	0.3	1.8	7.7	13.8		
5ANTW109.02	4/1/2010	S	0.3	12.6	6.7	10.1		
5ANTW109.02	6/1/2010	S	0.3	23.9	7	7.2		
5ANTW109.02	8/4/2010	S	0.3	24.7	7.1	6.8		
5ANTW109.02	10/18/2010	S	0.3	12.4	6.9	9.1		
5ANTW109.02	12/6/2010	S	0.3	4.6	7	12.6		
5ANTW109.02	1/12/2011	S	0.3	0.8	7.5	13.3		
5ANTW109.02	3/16/2011	S	0.3	10.1	6.8	10.6		
5ANTW109.02	5/16/2011	S	0.3	19.6	7.2	7.5		
5ANTW109.02	7/18/2011	S	0.3	24	7.3	6.7		
5ANTW109.02	9/6/2011	S	0.3	23.7	7.5	6.2		

Station ID	Collection Date	Depth Desc	Depth	Temp Celcius	Field Ph	Do Probe	Do Winkler	Fdt Do Optical
5ANTW109.02	11/17/2011	S	0.3	13.3	7.1	9		
5ANTW109.02	2/13/2012	S	0.3	2.6	7.14	13.14		
5ANTW109.02	4/19/2012	S	0.3	17.43	7.21	8.04		
5ANTW109.02	6/7/2012	S	0.3	18.45	7.25	7.76		
5ANTW109.02	8/1/2012	S	0.3	25.06	7.13	6.2		
5ANTW109.02	10/3/2012	S	0.3	20.04	6.63	7.84		
5ANTW109.02	12/11/2012	S	0.3	11.5	7.31	8.97		
5ANTW109.02	1/22/2013	S	0.3	5.24	7.16	13.47		
5ANTW109.02	2/19/2013	S	0.3	4.88	7.07	12.58		
5ANTW109.02	3/25/2013	S	0.3	6.23	7.15	12.3		
5ANTW109.02	4/11/2013	S	0.3	19.26	6.9	8.72		
5ANTW109.02	5/7/2013	S	0.3	16.01	7.07	8.7		
5ANTW109.02	6/4/2013	S	0.3	25.68	7.08	6.92		
5ANTW109.02	7/29/2013	S	0.3	25.36	6.86	7.57		
5ANTW109.02	8/12/2013	S	0.3	26.14	6.61	6.83		
5ANTW109.02	9/24/2013	S	0.3	17.7	6.57	9		
5ANTW109.02	10/23/2013	S	0.3	13.99	6.69	9.14		
5ANTW109.02	11/21/2013	S	0.3	9.02	7.33	11.01		
5ANTW109.02	12/16/2013	S	0.3	4.52	6.94	12.92		
5ANTW109.02	1/9/2014	S	0.3	1.4	7.09	13.78		
5ANTW109.02	3/6/2014	S	0.3	4.2	7.26	11.74		
90th Percentile				**25.6**	**7.5**			
10th Percentile				**4.0**	**6.5**			

					900	
					HARDNESS, TOTAL (MG/L AS CACO3)	
Sta Id	**Collection Date Time**	**Depth Desc**	**Depth**	**Container Id Desc**	**Value**	**Com Code**
5ANTW109.02	12/6/1988 15:10	S	0.3	R	20	
5ANTW109.02	1/19/1989 16:05	S	0.3	R	20	
5ANTW109.02	3/14/1989 15:30	S	0.3	R	16	
5ANTW109.02	4/17/1989 15:45	S	0.3	R	18	
5ANTW109.02	5/11/1989 13:10	S	0.3	R	20	
5ANTW109.02	9/13/1989 14:55	S	0.3	R	28	
5ANTW109.02	10/12/1989 15:10	S	0.3	R	20	
5ANTW109.02	11/14/1989 15:30	S	0.3	R	24	
5ANTW109.02	12/27/1989 16:10	S	0.3	R	24	
5ANTW109.02	1/8/1990 16:10	S	0.3	R	16	
5ANTW109.02	2/1/1990 13:50	S	0.3	R	22	
5ANTW109.02	3/5/1990 14:15	S	0.3	R	22	
5ANTW109.02	4/2/1990 14:00	S	0.3	R	24	
5ANTW109.02	5/1/1990 17:00	S	0.3	R	28	
5ANTW109.02	6/5/1990 15:05	S	0.3	R	20	
5ANTW109.02	7/16/1990 15:45	S	0.3	R	28	
5ANTW109.02	8/13/1990 15:00	S	0.3	R	26	
5ANTW109.02	9/13/1990 13:25	S	0.3	R	38	
5ANTW109.02	10/11/1990 14:45	S	0.3	R	32	
5ANTW109.02	11/27/1990 15:10	S	0.3	R	28	
5ANTW109.02	12/5/1990 12:35	S	0.3	R	28	
5ANTW109.02	1/28/1991 13:40	S	0.3	R	18	
5ANTW109.02	2/12/1991 14:15	S	0.09	R	28	
5ANTW109.02	3/28/1991 12:51	B	0.3	R	44	
5ANTW109.02	4/29/1991 14:05	S	0.09	R	24	
5ANTW109.02	5/23/1991 14:24	S	0.3	R	36	
5ANTW109.02	6/19/1991 14:20	S	0.3	R	52	
5ANTW109.02	7/22/1991 15:25	S	0.3	R	32	
5ANTW109.02	8/20/1991 14:35	S	0.3	R	26	
5ANTW109.02	9/19/1991 14:50	S	0.3	R	40	
5ANTW109.02	11/25/1991 13:49	S	0.3	R	26	
5ANTW109.02	12/19/1991 13:15	S	0.3	R	24	
5ANTW109.02	1/16/1992 13:44	S	0.3	R	22	
5ANTW109.02	2/25/1992 13:05	S	0.3	R	24	
5ANTW109.02	3/18/1992 13:40	S	0.3	R	15	
5ANTW109.02	4/28/1992 13:50	S	0.3	R	30	
5ANTW109.02	5/20/1992 14:35	S	0.3	R	28	
5ANTW109.02	6/22/1992 13:15	S	0.3	R	30	
5ANTW109.02	7/13/1992 15:31	S	0.3	R	40	
5ANTW109.02	8/20/1992 15:19	S	0.3	R	30	
5ANTW109.02	9/21/1992 13:29	S	0.3	R	40	
5ANTW109.02	10/20/1992 14:40	S	0.3	R	40	
5ANTW109.02	11/12/1992 14:00	S	0.3	R	34	
5ANTW109.02	12/8/1992 14:00	S	0.3	R	31	
5ANTW109.02	1/19/1993 14:24	S	0.3	R	22	
5ANTW109.02	2/17/1993 14:44	S	0.3	R	22	
5ANTW109.02	3/16/1993 14:00	S	0.3	R	16	
5ANTW109.02	4/14/1993 12:45	S	0.3	R	22	
5ANTW109.02	5/17/1993 14:25	S	0.3	R	28	
5ANTW109.02	6/9/1993 13:20	S	0.3	R	22	

					900	
					HARDNESS, TOTAL (MG/L AS CACO3)	
Sta Id	**Collection Date Time**	**Depth Desc**	**Depth**	**Container Id Desc**	**Value**	**Com Code**
5ANTW109.02	7/14/1993 14:00	S	0.3	R	40	
5ANTW109.02	8/11/1993 14:30	S	0.3	R	30	
5ANTW109.02	9/23/1993 15:25	S	0.3	R	46	
5ANTW109.02	10/21/1993 14:22	S	0.3	R	40	
5ANTW109.02	11/15/1993 15:00	S	0.3	R	42	
5ANTW109.02	12/15/1993 13:55	S	0.3	R	32	
5ANTW109.02	1/25/1994 9:50	S	0.3	R	22	
5ANTW109.02	2/16/1994 15:29	S	0.3	R	16	
5ANTW109.02	3/14/1994 14:34	S	0.3	R	11	
5ANTW109.02	4/13/1994 15:12	S	0.3	R	20	
5ANTW109.02	5/12/1994 14:00	S	0.3	R	22	
5ANTW109.02	6/13/1994 14:22	S	0.3	R	24	
5ANTW109.02	7/13/1994 10:10	S	0.3	R	29	
5ANTW109.02	8/25/1994 10:30	S	0.3	R	22	
5ANTW109.02	9/19/1994 15:00	S	0.3	R	27	
5ANTW109.02	10/19/1994 10:20	S	0.3	R	22	
5ANTW109.02	11/7/1994 10:55	S	0.3	R	22	
5ANTW109.02	12/12/1994 11:11	S	0.3	R	22	
5ANTW109.02	1/11/1995 11:11	S	0.3	R	26	
5ANTW109.02	2/24/1995 9:23	S	0.3	R	20	
5ANTW109.02	3/20/1995 9:11	S	0.3	R	22	
5ANTW109.02	4/24/1995 7:00	S	0.3	R	30	
5ANTW109.02	5/22/1995 10:21	S	0.3	R	20	
5ANTW109.02	6/26/1995 11:45	S	0.3	R	35	
5ANTW109.02	7/26/1995 8:00	S	0.3	R	35	
5ANTW109.02	8/24/1995 9:00	S	0.3	R	34	
5ANTW109.02	9/26/1995 9:00	S	0.3	R	31	
5ANTW109.02	10/30/1995 9:00	S	0.3	R	22	
5ANTW109.02	11/28/1995 7:33	S	0.3	R	25	
5ANTW109.02	12/20/1995 8:45	S	0.3	R	25	
5ANTW109.02	1/23/1996 9:50	S	0.3	R	14	
5ANTW109.02	2/22/1996 7:21	S	0.3	R	24	
5ANTW109.02	3/26/1996 10:00	S	0.3	R	20	
5ANTW109.02	4/16/1996 10:30	S	0.3	R	20	
5ANTW109.02	5/7/1996 10:08	S	0.3	R	29	
5ANTW109.02	6/5/1996 10:00	S	0.3	R	36	
5ANTW109.02	7/8/1996 11:00	S	0.3	R	32	
5ANTW109.02	8/8/1996 11:00	S	0.3	R	21	
5ANTW109.02	9/5/1996 10:50	S	0.3	R	32	
5ANTW109.02	10/2/1996 9:22	S	0.3	R	24	
5ANTW109.02	11/6/1996 11:11	S	0.3	R	27	
5ANTW109.02	12/2/1996 9:45	S	0.3	R	18	
5ANTW109.02	1/6/1997 8:30	S	0.3	R	22	
5ANTW109.02	2/3/1997 10:50	S	0.3	R	21.9	
5ANTW109.02	3/24/1997 7:00	S	0.3	R	20.9	
5ANTW109.02	4/15/1997 8:00	S	0.3	R	24.8	
5ANTW109.02	5/7/1997 10:00	S	0.3	R	21.1	
5ANTW109.02	6/10/1997 9:30	S	0.3	R	23.4	
5ANTW109.02	7/21/1997 10:45	S	0.3	R	25.9	
5ANTW109.02	8/12/1997 6:45	S	0.3	R	23.9	

					900	
					HARDNESS, TOTAL (MG/L AS CACO3)	
Sta Id	**Collection Date Time**	**Depth Desc**	**Depth**	**Container Id Desc**	**Value**	**Com Code**
5ANTW109.02	9/18/1997 10:30	S	0.3	R	12	
5ANTW109.02	10/16/1997 11:00	S	0.3	R	26.4	
5ANTW109.02	11/24/1997 8:15	S	0.3	R	21.5	
5ANTW109.02	12/17/1997 14:20	S	0.3	R	25.7	
5ANTW109.02	1/28/1998 8:45	S	0.3	R	10.4	
5ANTW109.02	2/23/1998 13:45	S	0.3	R	35.4	
5ANTW109.02	3/25/1998 10:00	S	0.3	R	15.3	
5ANTW109.02	4/21/1998 9:05	S	0.3	R	17	
5ANTW109.02	5/21/1998 6:40	S	0.3	R	15.9	
5ANTW109.02	6/24/1998 5:45	S	0.3	R	13	
5ANTW109.02	7/30/1998 6:30	S	0.3	R	32	
5ANTW109.02	8/25/1998 9:15	S	0.3	R	17.4	
5ANTW109.02	9/24/1998 7:15	S	0.3	R	15.4	
5ANTW109.02	10/29/1998 11:55	S	0.3	R	28	
5ANTW109.02	11/19/1998 8:10	S	0.3	R	28	
5ANTW109.02	12/17/1998 6:50	S	0.3	R	21.3	
5ANTW109.02	1/21/1999 10:10	S	0.3	R	24	
5ANTW109.02	2/17/1999 7:10	S	0.3	R	44	
5ANTW109.02	3/10/1999 11:00	S	0.3	R	30	
5ANTW109.02	4/22/1999 10:25	S	0.3	R	36	
5ANTW109.02	5/19/1999 8:10	S	0.3	R	24	
5ANTW109.02	6/16/1999 17:17	S	0.3	R	24.3	
5ANTW109.02	7/22/1999 12:00	S	0.3	R	30.7	
5ANTW109.02	8/16/1999 10:35	S	0.3	R	24.2	
5ANTW109.02	9/15/1999 11:15	S	0.3	R	21.6	
5ANTW109.02	10/21/1999 12:00	S	0.3	R	23.8	
5ANTW109.02	12/27/1999 17:15	S	0.3	R	25.5	
5ANTW109.02	1/19/2000 9:20	S	0.3	R	15.8	
5ANTW109.02	2/14/2000 9:00	S	0.3	R	20.1	
5ANTW109.02	3/8/2000 8:40	S	0.3	R	12	
5ANTW109.02	4/17/2000 9:00	S	0.3	R	15	
5ANTW109.02	5/8/2000 9:30	S	0.3	R	8	
5ANTW109.02	6/1/2000 9:40	S	0.3	R	16	
5ANTW109.02	6/29/2000 9:15	S	0.3	R	18.4	
5ANTW109.02	8/15/2000 9:10	S	0.3	R	19.2	
5ANTW109.02	9/6/2000 8:55	S	0.3	R	21	
5ANTW109.02	9/28/2000 8:45	S	0.3	R	18.7	
5ANTW109.02	12/11/2000 9:40	S	0.3	R	21	
5ANTW109.02	2/26/2001 10:30	S	0.3	R	19	
5ANTW109.02	5/22/2001 10:10	S	0.3	R	24	
5ANTW109.02	7/26/2001 10:05	S	0.3	R	16.9	
5ANTW109.02	9/24/2001 10:20	S	0.3	R	23.3	
5ANTW109.02	11/14/2001 11:45	S	0.3	R	14.3	
5ANTW109.02	1/28/2002 15:00	S	0.3	R	11.8	
5ANTW109.02	3/18/2002 13:15	S	0.3	R	20.6	
5ANTW109.02	5/7/2002 11:05	S	0.3	R	18.9	
5ANTW109.02	8/22/2002 11:15	S	0.3	R	24.4	
5ANTW109.02	10/29/2002 11:00	S	0.3	R	24.5	
5ANTW109.02	12/11/2002 11:50	S	0.3	R	19.3	
5ANTW109.02	2/12/2003 12:10	S	0.3	R	16.7	

					900	
					HARDNESS, TOTAL (MG/L AS CACO3)	
Sta Id	**Collection Date Time**	**Depth Desc**	**Depth**	**Container Id Desc**	**Value**	**Com Code**
5ANTW109.02	4/22/2003 11:40	S	0.3	R	19	
5ANTW109.02	6/3/2003 11:00	S	0.3	R	18.5	
5ANTW109.02	8/18/2003 11:05	S	0.3	R	23.7	
5ANTW109.02	10/9/2003 11:10	S	0.3	R	19	
5ANTW109.02	12/22/2003 11:35	S	0.3	R	26	
5ANTW109.02	3/1/2004 10:45	S	0.3	R	20.2	
5ANTW109.02	4/26/2004 12:12	S	0.3	R	17.9	
5ANTW109.02	6/3/2004 10:30	S	0.3	R	24	
5ANTW109.02	7/29/2004 11:15	S	0.3	R	23.9	
5ANTW109.02	10/5/2004 10:45	S	0.3	R	20.3	
5ANTW109.02	11/18/2004 11:20	S	0.3	R	26	
5ANTW109.02	1/11/2005 10:35	S	0.3	R	22	
5ANTW109.02	3/24/2005 11:30	S	0.3	R	20	
5ANTW109.02	5/23/2005 11:00	S	0.3	R	28	
5ANTW109.02	7/12/2005 10:50	S	0.3	R	24	
5ANTW109.02	9/27/2005 11:15	S	0.3	R	32	
5ANTW109.02	11/21/2005 11:50	S	0.3	R	28	
5ANTW109.02	1/25/2006 10:20	S	0.3	R	25	
5ANTW109.02	3/9/2006 12:00	S	0.3	R	24	
5ANTW109.02	5/23/2006 12:00	S	0.3	R	33	
5ANTW109.02	7/24/2006 11:15	S	0.3	R	20	
5ANTW109.02	9/20/2006 11:00	S	0.3	R	22	
5ANTW109.02	11/30/2006 11:50	S	0.3	R	18	
Average					**24.5**	

ATTACHMENT D

2014 MSTRANTI, Mix.exe and STATS.exe results;
2012 MSTRANTI, Mix.exe, and STATS.exe results

FRESHWATER
WATER QUALITY CRITERIA / WASTELOAD ALLOCATION ANALYSIS

Facility Name: Nottoway Motel and Restaurant Permit No.: VA0028291

Receiving Stream: Nottoway River Version: OWP Guidance Memo 00-2011 (8/24/00)

Stream Information		
Mean Hardness (as CaCO3) =	25	mg/L
90% Temperature (Annual) =	25.6	deg C
90% Temperature (Wet season) =	NA	deg C
90% Maximum pH =	7.5	SU
10% Maximum pH =	6.5	SU
Tier Designation (1 or 2) =	2	
Public Water Supply (PWS) Y/N? =	N	
Trout Present Y/N? =	N	
Early Life Stages Present Y/N? =	Y	

Stream Flows		
1Q10 (Annual) =	2.6	MGD
7Q10 (Annual) =	3.5	MGD
30Q10 (Annual) =	8.3	MGD
1Q10 (Wet season) =	NA	MGD
30Q10 (Wet season)	NA	MGD
30Q5 =	14	MGD
Harmonic Mean =	53	MGD

Mixing Information		
Annual - 1Q10 Mix =	20.02	%
- 7Q10 Mix =	100	%
- 30Q10 Mix =	100	%
Wet Season - 1Q10 Mix =	100	%
- 30Q10 Mix =	100	%

Effluent Information		
Mean Hardness (as CaCO3) =	25	mg/L
90% Temp (Annual) =	28	deg C
90% Temp (Wet season) =	NA	deg C
90% Maximum pH =	8	SU
10% Maximum pH =	7.5	SU
Discharge Flow =	0.02	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	--	--	na	9.9E+02	--	--	na	6.9E+05	--	--	na	9.9E+01	--	--	na	6.9E+04	**--**	**--**	**na**	**6.9E+04**
Acrolein	0	--	--	na	9.3E+00	--	--	na	6.5E+03	--	--	na	9.3E-01	--	--	na	6.5E+02	**--**	**--**	**na**	**6.5E+02**
Acrylonitrile[C]	0	--	--	na	2.5E+00	--	--	na	6.6E+03	--	--	na	2.5E-01	--	--	na	6.6E+02	**--**	**--**	**na**	**6.6E+02**
Aldrin [C]	0	3.0E+00	--	na	5.0E-04	8.1E+01	--	na	1.3E+00	7.5E-01	--	na	5.0E-05	9.8E+01	--	na	1.3E-01	**8.1E+01**	**--**	**na**	**1.3E-01**
Ammonia-N (mg/l) (Yearly)	0	1.96E+01	2.13E+00	na	--	5.29E+02	#######	na	--	4.96E+00	5.33E-01	na	--	6.49E+02	#######	na	--	**5.29E+02**	**2.22E+02**	**na**	**--**
Ammonia-N (mg/l) (High Flow)	0	#VALUE!	#VALUE!	na	--	#VALUE!	#VALUE!	na	--	#VALUE!	#VALUE!	na	--	#VALUE!	#VALUE!	na	--	**#VALUE!**	**#VALUE!**	**na**	**--**
Anthracene	0	--	--	na	4.0E+04	--	--	na	2.8E+07	--	--	na	4.0E+03	--	--	na	2.8E+06	**--**	**--**	**na**	**2.8E+06**
Antimony	0	--	--	na	6.4E+02	--	--	na	4.5E+05	--	--	na	6.4E+01	--	--	na	4.5E+04	**--**	**--**	**na**	**4.5E+04**
Arsenic	0	3.4E+02	1.5E+02	na	--	9.2E+03	2.6E+04	na	--	8.5E+01	3.8E+01	na	--	1.1E+04	6.6E+03	na	--	**9.2E+03**	**6.6E+03**	**na**	**--**
Barium	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	**--**	**--**	**na**	**--**
Benzene [C]	0	--	--	na	5.1E+02	--	--	na	1.4E+06	--	--	na	5.1E+01	--	--	na	1.4E+05	**--**	**--**	**na**	**1.4E+05**
Benzidine[C]	0	--	--	na	2.0E-03	--	--	na	5.3E+00	--	--	na	2.0E-04	--	--	na	5.3E-01	**--**	**--**	**na**	**5.3E-01**
Benzo (a) anthracene [C]	0	--	--	na	1.8E-01	--	--	na	4.8E+02	--	--	na	1.8E-02	--	--	na	4.8E+01	**--**	**--**	**na**	**4.8E+01**
Benzo (b) fluoranthene [C]	0	--	--	na	1.8E-01	--	--	na	4.8E+02	--	--	na	1.8E-02	--	--	na	4.8E+01	**--**	**--**	**na**	**4.8E+01**
Benzo (k) fluoranthene [C]	0	--	--	na	1.8E-01	--	--	na	4.8E+02	--	--	na	1.8E-02	--	--	na	4.8E+01	**--**	**--**	**na**	**4.8E+01**
Benzo (a) pyrene [C]	0	--	--	na	1.8E-01	--	--	na	4.8E+02	--	--	na	1.8E-02	--	--	na	4.8E+01	**--**	**--**	**na**	**4.8E+01**
Bis2-Chloroethyl Ether [C]	0	--	--	na	5.3E+00	--	--	na	1.4E+04	--	--	na	5.3E-01	--	--	na	1.4E+03	**--**	**--**	**na**	**1.4E+03**
Bis2-Chloroisopropyl Ether	0	--	--	na	6.5E+04	--	--	na	4.6E+07	--	--	na	6.5E+03	--	--	na	4.6E+06	**--**	**--**	**na**	**4.6E+06**
Bis 2-Ethylhexyl Phthalate [C]	0	--	--	na	2.2E+01	--	--	na	5.8E+04	--	--	na	2.2E+00	--	--	na	5.8E+03	**--**	**--**	**na**	**5.8E+03**
Bromoform [C]	0	--	--	na	1.4E+03	--	--	na	3.7E+06	--	--	na	1.4E+02	--	--	na	3.7E+05	**--**	**--**	**na**	**3.7E+05**
Butylbenzylphthalate	0	--	--	na	1.9E+03	--	--	na	1.3E+06	--	--	na	1.9E+02	--	--	na	1.3E+05	**--**	**--**	**na**	**1.3E+05**
Cadmium	0	8.2E-01	3.8E-01	na	--	2.2E+01	6.7E+01	na	--	2.1E-01	9.5E-02	na	--	2.7E+01	1.7E+01	na	--	**2.2E+01**	**1.7E+01**	**na**	**--**
Carbon Tetrachloride [C]	0	--	--	na	1.6E+01	--	--	na	4.2E+04	--	--	na	1.6E+00	--	--	na	4.2E+03	**--**	**--**	**na**	**4.2E+03**
Chlordane [C]	0	2.4E+00	4.3E-03	na	8.1E-03	6.5E+01	7.6E-01	na	2.1E+01	6.0E-01	1.1E-03	na	8.1E-04	7.9E+01	1.9E-01	na	2.1E+00	**6.5E+01**	**1.9E-01**	**na**	**2.1E+00**
Chloride	0	8.6E+05	2.3E+05	na	--	2.3E+07	4.0E+07	na	--	2.2E+05	5.8E+04	na	--	2.8E+07	1.0E+07	na	--	**2.3E+07**	**1.0E+07**	**na**	**--**
TRC	0	1.9E+01	1.1E+01	na	--	5.1E+02	1.9E+03	na	--	4.8E+00	2.8E+00	na	--	6.2E+02	4.8E+02	na	--	**5.1E+02**	**4.8E+02**	**na**	**--**
Chlorobenzene	0	--	--	na	1.6E+03	--	--	na	1.1E+06	--	--	na	1.6E+02	--	--	na	1.1E+05	**--**	**--**	**na**	**1.1E+05**

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	--	--	na	1.3E+02	--	--	na	3.4E+05	--	--	na	1.3E+01	--	--	na	3.4E+04	**--**	**--**	**na**	**3.4E+04**
Chloroform	0	--	--	na	1.1E+04	--	--	na	7.7E+06	--	--	na	1.1E+03	--	--	na	7.7E+05	**--**	**--**	**na**	**7.7E+05**
2-Chloronaphthalene	0	--	--	na	1.6E+03	--	--	na	1.1E+06	--	--	na	1.6E+02	--	--	na	1.1E+05	**--**	**--**	**na**	**1.1E+05**
2-Chlorophenol	0	--	--	na	1.5E+02	--	--	na	1.1E+05	--	--	na	1.5E+01	--	--	na	1.1E+04	**--**	**--**	**na**	**1.1E+04**
Chlorpyrifos	0	8.3E-02	4.1E-02	na	--	2.2E+00	7.2E+00	na	--	2.1E-02	1.0E-02	na	--	2.7E+00	1.8E+00	na	--	**2.2E+00**	**1.8E+00**	**na**	**--**
Chromium III	0	1.8E+02	2.4E+01	na	--	4.9E+03	4.2E+03	na	--	4.6E+01	6.0E+00	na	--	6.0E+03	1.0E+03	na	--	**4.9E+03**	**1.0E+03**	**na**	**--**
Chromium VI	0	1.6E+01	1.1E+01	na	--	4.3E+02	1.9E+03	na	--	4.0E+00	2.8E+00	na	--	5.2E+02	4.8E+02	na	--	**4.3E+02**	**4.8E+02**	**na**	**--**
Chromium, Total	0	--	--	1.0E+02	--	--	--	na	--	--	--	1.0E+01	--	--	--	7.0E+03	--	**--**	**--**	**na**	**--**
Chrysene [C]	0	--	--	na	1.8E-02	--	--	na	4.8E+01	--	--	na	1.8E-03	--	--	na	4.8E+00	**--**	**--**	**na**	**4.8E+00**
Copper	0	3.6E+00	2.7E+00	na	--	9.8E+01	4.8E+02	na	--	9.1E-01	6.8E-01	na	--	1.2E+02	1.2E+02	na	--	**9.8E+01**	**1.2E+02**	**na**	**--**
Cyanide, Free	0	2.2E+01	5.2E+00	na	1.6E+04	5.9E+02	9.2E+02	na	1.1E+07	5.5E+00	1.3E+00	na	1.6E+03	7.2E+02	2.3E+02	na	1.1E+06	**5.9E+02**	**2.3E+02**	**na**	**1.1E+06**
DDD [C]	0	--	--	na	3.1E-03	--	--	na	8.2E+00	--	--	na	3.1E-04	--	--	na	8.2E-01	**--**	**--**	**na**	**8.2E-01**
DDE [C]	0	--	--	na	2.2E-03	--	--	na	5.8E+00	--	--	na	2.2E-04	--	--	na	5.8E-01	**--**	**--**	**na**	**5.8E-01**
DDT [C]	0	1.1E+00	1.0E-03	na	2.2E-03	3.0E+01	1.8E-01	na	5.8E+00	2.8E-01	2.5E-04	na	2.2E-04	3.6E+01	4.4E-02	na	5.8E-01	**3.0E+01**	**4.4E-02**	**na**	**5.8E-01**
Demeton	0	--	1.0E-01	na	--	--	1.8E+01	na	--	--	2.5E-02	na	--	--	4.4E+00	na	--	**--**	**4.4E+00**	**na**	**--**
Diazinon	0	1.7E-01	1.7E-01	na	--	4.6E+00	3.0E+01	na	--	4.3E-02	4.3E-02	na	--	5.6E+00	7.5E+00	na	--	**4.6E+00**	**7.5E+00**	**na**	**--**
Dibenz(a,h)anthracene [C]	0	--	--	na	1.8E-01	--	--	na	4.8E+02	--	--	na	1.8E-02	--	--	na	4.8E+01	**--**	**--**	**na**	**4.8E+01**
1,2-Dichlorobenzene	0	--	--	na	1.3E+03	--	--	na	9.1E+05	--	--	na	1.3E+02	--	--	na	9.1E+04	**--**	**--**	**na**	**9.1E+04**
1,3-Dichlorobenzene	0	--	--	na	9.6E+02	--	--	na	6.7E+05	--	--	na	9.6E+01	--	--	na	6.7E+04	**--**	**--**	**na**	**6.7E+04**
1,4-Dichlorobenzene	0	--	--	na	1.9E+02	--	--	na	1.3E+05	--	--	na	1.9E+01	--	--	na	1.3E+04	**--**	**--**	**na**	**1.3E+04**
3,3-Dichlorobenzidine[C]	0	--	--	na	2.8E-01	--	--	na	7.4E+02	--	--	na	2.8E-02	--	--	na	7.4E+01	**--**	**--**	**na**	**7.4E+01**
Dichlorobromomethane [C]	0	--	--	na	1.7E+02	--	--	na	4.5E+05	--	--	na	1.7E+01	--	--	na	4.5E+04	**--**	**--**	**na**	**4.5E+04**
1,2-Dichloroethane [C]	0	--	--	na	3.7E+02	--	--	na	9.8E+05	--	--	na	3.7E+01	--	--	na	9.8E+04	**--**	**--**	**na**	**9.8E+04**
1,1-Dichloroethylene	0	--	--	na	7.1E+03	--	--	na	5.0E+06	--	--	na	7.1E+02	--	--	na	5.0E+05	**--**	**--**	**na**	**5.0E+05**
1,2-trans-dichloroethylene	0	--	--	na	1.0E+04	--	--	na	7.0E+06	--	--	na	1.0E+03	--	--	na	7.0E+05	**--**	**--**	**na**	**7.0E+05**
2,4-Dichlorophenol	0	--	--	na	2.9E+02	--	--	na	2.0E+05	--	--	na	2.9E+01	--	--	na	2.0E+04	**--**	**--**	**na**	**2.0E+04**
2,4-Dichlorophenoxy acetic acid (2,4-D)	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	**--**	**--**	**na**	**--**
1,2-Dichloropropane[C]	0	--	--	na	1.5E+02	--	--	na	4.0E+05	--	--	na	1.5E+01	--	--	na	4.0E+04	**--**	**--**	**na**	**4.0E+04**
1,3-Dichloropropene [C]	0	--	--	na	2.1E+02	--	--	na	5.6E+05	--	--	na	2.1E+01	--	--	na	5.6E+04	**--**	**--**	**na**	**5.6E+04**
Dieldrin [C]	0	2.4E-01	5.6E-02	na	5.4E-04	6.5E+00	9.9E+00	na	1.4E+00	6.0E-02	1.4E-02	na	5.4E-05	7.9E+00	2.5E+00	na	1.4E-01	**6.5E+00**	**2.5E+00**	**na**	**1.4E-01**
Diethyl Phthalate	0	--	--	na	4.4E+04	--	--	na	3.1E+07	--	--	na	4.4E+03	--	--	na	3.1E+06	**--**	**--**	**na**	**3.1E+06**
2,4-Dimethylphenol	0	--	--	na	8.5E+02	--	--	na	6.0E+05	--	--	na	8.5E+01	--	--	na	6.0E+04	**--**	**--**	**na**	**6.0E+04**
Dimethyl Phthalate	0	--	--	na	1.1E+06	--	--	na	7.7E+08	--	--	na	1.1E+05	--	--	na	7.7E+07	**--**	**--**	**na**	**7.7E+07**
Di-n-Butyl Phthalate	0	--	--	na	4.5E+03	--	--	na	3.2E+06	--	--	na	4.5E+02	--	--	na	3.2E+05	**--**	**--**	**na**	**3.2E+05**
2,4 Dinitrophenol	0	--	--	na	5.3E+03	--	--	na	3.7E+06	--	--	na	5.3E+02	--	--	na	3.7E+05	**--**	**--**	**na**	**3.7E+05**
2-Methyl-4,6-Dinitrophenol	0	--	--	na	2.8E+02	--	--	na	2.0E+05	--	--	na	2.8E+01	--	--	na	2.0E+04	**--**	**--**	**na**	**2.0E+04**
2,4-Dinitrotoluene [C]	0	--	--	na	3.4E+01	--	--	na	9.0E+04	--	--	na	3.4E+00	--	--	na	9.0E+03	**--**	**--**	**na**	**9.0E+03**
Dioxin 2,3,7,8-tetrachlorodibenzo-p-dioxin	0	--	--	na	5.1E-08	--	--	na	3.6E-05	--	--	na	5.1E-09	--	--	na	3.6E-06	**--**	**--**	**na**	**3.6E-06**
1,2-Diphenylhydrazine[C]	0	--	--	na	2.0E+00	--	--	na	5.3E+03	--	--	na	2.0E-01	--	--	na	5.3E+02	**--**	**--**	**na**	**5.3E+02**
Alpha-Endosulfan	0	2.2E-01	5.6E-02	na	8.9E+01	5.9E+00	9.9E+00	na	6.2E+04	5.5E-02	1.4E-02	na	8.9E+00	7.2E+00	2.5E+00	na	6.2E+03	**5.9E+00**	**2.5E+00**	**na**	**6.2E+03**
Beta-Endosulfan	0	2.2E-01	5.6E-02	na	8.9E+01	5.9E+00	9.9E+00	na	6.2E+04	5.5E-02	1.4E-02	na	8.9E+00	7.2E+00	2.5E+00	na	6.2E+03	**5.9E+00**	**2.5E+00**	**na**	**6.2E+03**
Alpha + Beta Endosulfan	0	2.2E-01	5.6E-02	--	--	5.9E+00	9.9E+00	--	--	5.5E-02	1.4E-02	--	--	7.2E+00	2.5E+00	--	--	**5.9E+00**	**2.5E+00**	**--**	**--**
Endosulfan Sulfate	0	--	--	na	8.9E+01	--	--	na	6.2E+04	--	--	na	8.9E+00	--	--	na	6.2E+03	**--**	**--**	**na**	**6.2E+03**
Endrin	0	8.6E-02	3.6E-02	na	6.0E-02	2.3E+00	6.3E+00	na	4.2E+01	2.2E-02	9.0E-03	na	6.0E-03	2.8E+00	1.6E+00	na	4.2E+00	**2.3E+00**	**1.6E+00**	**na**	**4.2E+00**
Endrin Aldehyde	0	--	--	na	3.0E-01	--	--	na	2.1E+02	--	--	na	3.0E-02	--	--	na	2.1E+01	**--**	**--**	**na**	**2.1E+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**
Ethylbenzene	0	--	--	na	2.1E+03	--	--	na	1.5E+06	--	--	na	2.1E+02	--	--	na	1.5E+05	**--**	**--**	**na**	**1.5E+05**
Fluoranthene	0	--	--	na	1.4E+02	--	--	na	9.8E+04	--	--	na	1.4E+01	--	--	na	9.8E+03	**--**	**--**	**na**	**9.8E+03**
Fluorene	0	--	--	na	5.3E+03	--	--	na	3.7E+06	--	--	na	5.3E+02	--	--	na	3.7E+05	**--**	**--**	**na**	**3.7E+05**
Foaming Agents	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	**--**	**--**	**na**	**--**
Guthion	0	--	1.0E-02	na	--	--	1.8E+00	na	--	--	2.5E-03	na	--	--	4.4E-01	na	--	**--**	**4.4E-01**	**na**	**--**
Heptachlor [C]	0	5.2E-01	3.8E-03	na	7.9E-04	1.4E+01	6.7E-01	na	2.1E+00	1.3E-01	9.5E-04	na	7.9E-05	1.7E+01	1.7E-01	na	2.1E-01	**1.4E+01**	**1.7E-01**	**na**	**2.1E-01**
Heptachlor Epoxide[C]	0	5.2E-01	3.8E-03	na	3.9E-04	1.4E+01	6.7E-01	na	1.0E+00	1.3E-01	9.5E-04	na	3.9E-05	1.7E+01	1.7E-01	na	1.0E-01	**1.4E+01**	**1.7E-01**	**na**	**1.0E-01**
Hexachlorobenzene[C]	0	--	--	na	2.9E-03	--	--	na	7.7E+00	--	--	na	2.9E-04	--	--	na	7.7E-01	**--**	**--**	**na**	**7.7E-01**
Hexachlorobutadiene[C]	0	--	--	na	1.8E+02	--	--	na	4.8E+05	--	--	na	1.8E+01	--	--	na	4.8E+04	**--**	**--**	**na**	**4.8E+04**
Hexachlorocyclohexane Alpha-BHC[C]	0	--	--	na	4.9E-02	--	--	na	1.3E+02	--	--	na	4.9E-03	--	--	na	1.3E+01	**--**	**--**	**na**	**1.3E+01**
Hexachlorocyclohexane Beta-BHC[C]	0	--	--	na	1.7E-01	--	--	na	4.5E+02	--	--	na	1.7E-02	--	--	na	4.5E+01	**--**	**--**	**na**	**4.5E+01**
Hexachlorocyclohexane Gamma-BHC[C] (Lindane)	0	9.5E-01	na	na	1.8E+00	2.6E+01	--	na	4.8E+03	2.4E-01	--	na	1.8E-01	3.1E+01	--	na	4.8E+02	**2.6E+01**	**--**	**na**	**4.8E+02**
Hexachlorocyclopentadiene	0	--	--	na	1.1E+03	--	--	na	7.7E+05	--	--	na	1.1E+02	--	--	na	7.7E+04	**--**	**--**	**na**	**7.7E+04**
Hexachloroethane[C]	0	--	--	na	3.3E+01	--	--	na	8.7E+04	--	--	na	3.3E+00	--	--	na	8.7E+03	**--**	**--**	**na**	**8.7E+03**
Hydrogen Sulfide	0	--	2.0E+00	na	--	--	3.5E+02	na	--	--	5.0E-01	na	--	--	8.8E+01	na	--	**--**	**8.8E+01**	**na**	**--**
Indeno (1,2,3-cd) pyrene [C]	0	--	--	na	1.8E-01	--	--	na	4.8E+02	--	--	na	1.8E-02	--	--	na	4.8E+01	**--**	**--**	**na**	**4.8E+01**
Iron	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	**--**	**--**	**na**	**--**
Isophorone[C]	0	--	--	na	9.6E+03	--	--	na	2.5E+07	--	--	na	9.6E+02	--	--	na	2.5E+06	**--**	**--**	**na**	**2.5E+06**
Kepone	0	--	0.0E+00	na	--	--	0.0E+00	na	--	--	0.0E+00	na	--	--	0.0E+00	na	--	**--**	**0.0E+00**	**na**	**--**
Lead	0	2.0E+01	2.3E+00	na	--	5.5E+02	4.1E+02	na	--	5.1E+00	5.8E-01	na	--	6.7E+02	1.0E+02	na	--	**5.5E+02**	**1.0E+02**	**na**	**--**
Malathion	0	--	1.0E-01	na	--	--	1.8E+01	na	--	--	2.5E-02	na	--	--	4.4E+00	na	--	**--**	**4.4E+00**	**na**	**--**
Manganese	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	**--**	**--**	**na**	**--**
Mercury	0	1.4E+00	7.7E-01	- -	- -	3.8E+01	1.4E+02	- -	- -	3.5E-01	1.9E-01	- -	--	4.6E+01	3.4E+01	- -	--	**3.8E+01**	**3.4E+01**	**- -**	**- -**
Methyl Bromide	0	--	--	na	1.5E+03	--	--	na	1.1E+06	--	--	na	1.5E+02	--	--	na	1.1E+05	**--**	**--**	**na**	**1.1E+05**
Methylene Chloride [C]	0	--	--	na	5.9E+03	--	--	na	1.6E+07	--	--	na	5.9E+02	--	--	na	1.6E+06	**--**	**--**	**na**	**1.6E+06**
Methoxychlor	0	--	3.0E-02	na	--	--	5.3E+00	na	--	--	7.5E-03	na	--	--	1.3E+00	na	--	**--**	**1.3E+00**	**na**	**--**
Mirex	0	--	0.0E+00	na	--	--	0.0E+00	na	--	--	0.0E+00	na	--	--	0.0E+00	na	--	**--**	**0.0E+00**	**na**	**--**
Nickel	0	5.6E+01	6.3E+00	na	4.6E+03	1.5E+03	1.1E+03	na	3.2E+06	1.4E+01	1.6E+00	na	4.6E+02	1.8E+03	2.8E+02	na	3.2E+05	**1.5E+03**	**2.8E+02**	**na**	**3.2E+05**
Nitrate (as N)	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	**--**	**--**	**na**	**--**
Nitrobenzene	0	--	--	na	6.9E+02	--	--	na	4.8E+05	--	--	na	6.9E+01	--	--	na	4.8E+04	**--**	**--**	**na**	**4.8E+04**
N-Nitrosodimethylamine[C]	0	--	--	na	3.0E+01	--	--	na	8.0E+04	--	--	na	3.0E+00	--	--	na	8.0E+03	**--**	**--**	**na**	**8.0E+03**
N-Nitrosodiphenylamine[C]	0	--	--	na	6.0E+01	--	--	na	1.6E+05	--	--	na	6.0E+00	--	--	na	1.6E+04	**--**	**--**	**na**	**1.6E+04**
N-Nitrosodi-n-propylamine[C]	0	--	--	na	5.1E+00	--	--	na	1.4E+04	--	--	na	5.1E-01	--	--	na	1.4E+03	**--**	**--**	**na**	**1.4E+03**
Nonylphenol	0	2.8E+01	6.6E+00	--	--	7.6E+02	1.2E+03	na	--	7.0E+00	1.7E+00	--	--	9.2E+02	2.9E+02	--	--	**7.6E+02**	**2.9E+02**	**na**	**--**
Parathion	0	6.5E-02	1.3E-02	na	--	1.8E+00	2.3E+00	na	--	1.6E-02	3.3E-03	na	--	2.1E+00	5.7E-01	na	--	**1.8E+00**	**5.7E-01**	**na**	**--**
PCB Total[C]	0	--	1.4E-02	na	6.4E-04	--	2.5E+00	na	1.7E+00	--	3.5E-03	na	6.4E-05	--	6.2E-01	na	1.7E-01	**--**	**6.2E-01**	**na**	**1.7E-01**
Pentachlorophenol [C]	0	5.4E+00	4.1E+00	na	3.0E+01	1.4E+02	7.1E+02	na	8.0E+04	1.3E+00	1.0E+00	na	3.0E+00	1.7E+02	1.8E+02	na	8.0E+03	**1.4E+02**	**1.8E+02**	**na**	**8.0E+03**
Phenol	0	--	--	na	8.6E+05	--	--	na	6.0E+08	--	--	na	8.6E+04	--	--	na	6.0E+07	**--**	**--**	**na**	**6.0E+07**
Pyrene	0	--	--	na	4.0E+03	--	--	na	2.8E+06	--	--	na	4.0E+02	--	--	na	2.8E+05	**--**	**--**	**na**	**2.8E+05**
Radionuclides	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	**--**	**--**	**na**	**--**
Gross Alpha Activity (pCi/L)	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	**--**	**--**	**na**	**--**
Beta and Photon Activity (mrem/yr)	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	**--**	**--**	**na**	**--**
Radium 226 + 228 (pCi/L)	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	**--**	**--**	**na**	**--**
Uranium (ug/l)	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	**--**	**--**	**na**	**--**

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	na	4.2E+03	5.4E+02	8.8E+02	na	2.9E+06	5.0E+00	1.3E+00	na	4.2E+02	6.6E+02	2.2E+02	na	2.9E+05	**5.4E+02**	**2.2E+02**	**na**	**2.9E+05**
Silver	0	3.2E-01	--	na	--	8.6E+00	--	na	--	7.9E-02	--	na	--	1.0E+01	--	na	--	**8.6E+00**	**--**	**na**	**--**
Sulfate	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	**--**	**--**	**na**	**--**
1,1,2,2-Tetrachloroethane[C]	0	--	--	na	4.0E+01	--	--	na	1.1E+05	--	--	na	4.0E+00	--	--	na	1.1E+04	**--**	**--**	**na**	**1.1E+04**
Tetrachloroethylene[C]	0	--	--	na	3.3E+01	--	--	na	8.7E+04	--	--	na	3.3E+00	--	--	na	8.7E+03	**--**	**--**	**na**	**8.7E+03**
Thallium	0	--	--	na	4.7E-01	--	--	na	3.3E+02	--	--	na	4.7E-02	--	--	na	3.3E+01	**--**	**--**	**na**	**3.3E+01**
Toluene	0	--	--	na	6.0E+03	--	--	na	4.2E+06	--	--	na	6.0E+02	--	--	na	4.2E+05	**--**	**--**	**na**	**4.2E+05**
Total dissolved solids	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	**--**	**--**	**na**	**--**
Toxaphene [C]	0	7.3E-01	2.0E-04	na	2.8E-03	2.0E+01	3.5E-02	na	7.4E+00	1.8E-01	5.0E-05	na	2.8E-04	2.4E+01	8.8E-03	na	7.4E-01	**2.0E+01**	**8.8E-03**	**na**	**7.4E-01**
Tributyltin	0	4.6E-01	7.2E-02	na	--	1.2E+01	1.3E+01	na	--	1.2E-01	1.8E-02	na	--	1.5E+01	3.2E+00	na	--	**1.2E+01**	**3.2E+00**	**na**	**--**
1,2,4-Trichlorobenzene	0	--	--	na	7.0E+01	--	--	na	4.9E+04	--	--	na	7.0E+00	--	--	na	4.9E+03	**--**	**--**	**na**	**4.9E+03**
1,1,2-Trichloroethane[C]	0	--	--	na	1.6E+02	--	--	na	4.2E+05	--	--	na	1.6E+01	--	--	na	4.2E+04	**--**	**--**	**na**	**4.2E+04**
Trichloroethylene [C]	0	--	--	na	3.0E+02	--	--	na	8.0E+05	--	--	na	3.0E+01	--	--	na	8.0E+04	**--**	**--**	**na**	**8.0E+04**
2,4,6-Trichlorophenol [C]	0	--	--	na	2.4E+01	--	--	na	6.4E+04	--	--	na	2.4E+00	--	--	na	6.4E+03	**--**	**--**	**na**	**6.4E+03**
2-(2,4,5-Trichlorophenoxy) propionic acid (Silvex)	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	**--**	**--**	**na**	**--**
Vinyl Chloride[C]	0	--	--	na	2.4E+01	--	--	na	6.4E+04	--	--	na	2.4E+00	--	--	na	6.4E+03	**--**	**--**	**na**	**6.4E+03**
Zinc	0	3.6E+01	3.6E+01	na	2.6E+04	9.8E+02	6.4E+03	na	1.8E+07	9.1E+00	9.1E+00	na	2.6E+03	1.2E+03	1.6E+03	na	1.8E+06	**9.8E+02**	**1.6E+03**	**na**	**1.8E+06**

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+04
Arsenic	3.7E+03
Barium	na
Cadmium	8.9E+00
Chromium III	6.3E+02
Chromium VI	1.7E+02
Copper	3.9E+01
Iron	na
Lead	6.1E+01
Manganese	na
Mercury	1.5E+01
Nickel	1.7E+02
Selenium	1.3E+02
Silver	3.4E+00
Zinc	3.9E+02

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

MSTRANTI DATA SOURCE REPORT

Stream Information	
Mean Hardness	Ambient monitoring data (Attachment C)
90% Temperature (annual)	Ambient monitoring data (Attachment C)
90% Temperature (wet season)	Ambient monitoring data (Attachment C)
90% Maximum pH	Ambient monitoring data (Attachment C)
10% Maximum pH	Ambient monitoring data (Attachment C)
Tier Designation	Tier Determination (Item 14 in 2012 permit Fact Sheet)
Stream Flows	
All Data	Flow Frequency Memo (Attachment A)
Mixing Information	
All Data	Mix.exe concluded that a complete mix is appropriate for 7Q10 and 30Q10 flow frequencies. A complete mix assumption is appropriate providing no more than 20.02% of the 1Q10 is used. (Attachment D)
Effluent Information	
Mean Hardness	Assumed conservative value used in the absence of actual data equals the minimum hardness allowed for use by the Virginia Water Quality Standards.
90% Temperature (annual)	In the absence of sufficient data, an assumed and expected 90% temperature value was used.
90% Maximum pH	Effluent DMR Data (Attachment E in 2012 permit Fact Sheet)
10% Maximum pH	Effluent DMR Data (Attachment E in 2012 permit Fact Sheet)
Discharge Flow	Design flow obtained from permit application

Mixing Zone Predictions for Nottoway Motel and Restaurant

Effluent Flow = .02 MGD
Stream 7Q10 = 3.5 MGD
Stream 30Q10 = 8.3 MGD
Stream 1Q10 = 2.6 MGD
Stream slope = .00038 ft/ft
Stream width = 40 ft
Bottom scale = 2
Channel scale = 1

Mixing Zone Predictions @ 7Q10

Depth = .5615 ft
Length = 3335.89 ft
Velocity = .2426 ft/sec
Residence Time = .1592 days

Recommendation:

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

Mixing Zone Predictions @ 30Q10

Depth = .9473 ft
Length = 2131.8 ft
Velocity = .3397 ft/sec
Residence Time = .0726 days

Recommendation:

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

Mixing Zone Predictions @ 1Q10

Depth = .4695 ft
Length = 3883.85 ft
Velocity = .216 ft/sec
Residence Time = 4.9957 hours

Recommendation:

A complete mix assumption is appropriate for this situation providing no more than 20.02% of the 1Q10 is used.

Virginia DEQ Mixing Zone Analysis Version 2.1

6/19/2014 3:01:57 PM

Facility = Nottoway Hotel and Restaurant
Chemical = Ammonia
Chronic averaging period = 30
WLAa   = 529
WLAc   = 222
Q.L.   = 1
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

No Limit is required for this material

The data are:

9

FRESHWATER
WATER QUALITY CRITERIA / WASTELOAD ALLOCATION ANALYSIS

Facility Name: Nottoway Motel and Restaurant

Permit No.: VA0028291

Receiving Stream: Nottoway River

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

Stream Information		
Mean Hardness (as CaCO3) =	25	mg/L
90% Temperature (Annual) =	25.6	deg C
90% Temperature (Wet season) =	NA	deg C
90% Maximum pH =	7.5	SU
10% Maximum pH =	6.5	SU
Tier Designation (1 or 2) =	2	
Public Water Supply (PWS) Y/N? =	n	
Trout Present Y/N? =	n	
Early Life Stages Present Y/N? =	y	

Stream Flows		
1Q10 (Annual) =	2.6	MGD
7Q10 (Annual) =	3.5	MGD
30Q10 (Annual) =	8.3	MGD
1Q10 (Wet season) =	NA	MGD
30Q10 (Wet season)	NA	MGD
30Q5 =	14	MGD
Harmonic Mean =	53	MGD

Mixing Information		
Annual - 1Q10 Mix =	19.99	%
- 7Q10 Mix =	100	%
- 30Q10 Mix =	100	%
Wet Season - 1Q10 Mix =	100	%
- 30Q10 Mix =	100	%

Effluent Information		
Mean Hardness (as CaCO3) =	25	mg/L
90% Temp (Annual) =	28	deg C
90% Temp (Wet season) =	NA	deg C
90% Maximum pH =	7.5	SU
10% Maximum pH =	7.5	SU
Discharge Flow =	0.016	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	--	--	na	9.9E+02	--	--	na	8.7E+05	--	--	na	9.9E+01	--	--	na	8.7E+04	**--**	**--**	**na**	**8.7E+04**
Acrolein	0	--	--	na	9.3E+00	--	--	na	8.1E+03	--	--	na	9.3E-01	--	--	na	8.1E+02	**--**	**--**	**na**	**8.1E+02**
Acrylonitrile[C]	0	--	--	na	2.5E+00	--	--	na	8.3E+03	--	--	na	2.5E-01	--	--	na	8.3E+02	**--**	**--**	**na**	**8.3E+02**
Aldrin [C]	0	3.0E+00	--	na	5.0E-04	1.0E+02	--	na	1.7E+00	7.5E-01	--	na	5.0E-05	1.2E+02	--	na	1.7E-01	**1.0E+02**	**--**	**na**	**1.7E-01**
Ammonia-N (mg/l) (Yearly)	0	1.99E+01	2.14E+00	na	--	6.66E+02	1.11E+03	na	--	4.97E+00	5.34E-01	na	--	8.13E+02	2.77E+02	na	--	**6.66E+02**	**2.77E+02**	**na**	**--**
Ammonia-N (mg/l) (High Flow)	0	#VALUE!	#VALUE!	na	--	#VALUE!	#VALUE!	na	--	#VALUE!	#VALUE!	na	--	#VALUE!	#VALUE!	na	--	**#VALUE!**	**#VALUE!**	**na**	**--**
Anthracene	0	--	--	na	4.0E+04	--	--	na	3.5E+07	--	--	na	4.0E+03	--	--	na	3.5E+06	**--**	**--**	**na**	**3.5E+06**
Antimony	0	--	--	na	6.4E+02	--	--	na	5.6E+05	--	--	na	6.4E+01	--	--	na	5.6E+04	**--**	**--**	**na**	**5.6E+04**
Arsenic	o	3.4E+02	1.5E+02	na	--	1.1E+04	3.3E+04	na	--	8.5E+01	3.8E+01	na	--	1.4E+04	8.2E+03	na	--	**1.1E+04**	**8.2E+03**	**na**	**--**
Barium	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	**--**	**--**	**na**	**--**
Benzene [C]	0	--	--	na	5.1E+02	--	--	na	1.7E+06	--	--	na	5.1E+01	--	--	na	1.7E+05	**--**	**--**	**na**	**1.7E+05**
Benzidine[C]	0	--	--	na	2.0E-03	--	--	na	6.6E+00	--	--	na	2.0E-04	--	--	na	6.6E-01	**--**	**--**	**na**	**6.6E-01**
Benzo (a) anthracene [C]	0	--	--	na	1.8E-01	--	--	na	6.0E+02	--	--	na	1.8E-02	--	--	na	6.0E+01	**--**	**--**	**na**	**6.0E+01**
Benzo (b) fluoranthene [C]	0	--	--	na	1.8E-01	--	--	na	6.0E+02	--	--	na	1.8E-02	--	--	na	6.0E+01	**--**	**--**	**na**	**6.0E+01**
Benzo (k) fluoranthene [C]	0	--	--	na	1.8E-01	--	--	na	6.0E+02	--	--	na	1.8E-02	--	--	na	6.0E+01	**--**	**--**	**na**	**6.0E+01**
Benzo (a) pyrene [C]	0	--	--	na	1.8E-01	--	--	na	6.0E+02	--	--	na	1.8E-02	--	--	na	6.0E+01	**--**	**--**	**na**	**6.0E+01**
Bis2-Chloroethyl Ether[C]	0	--	--	na	5.3E+00	--	--	na	1.8E+04	--	--	na	5.3E-01	--	--	na	1.8E+03	**--**	**--**	**na**	**1.8E+03**
Bis2-Chloroisopropyl Ether	0	--	--	na	6.5E+04	--	--	na	5.7E+07	--	--	na	6.5E+03	--	--	na	5.7E+06	**--**	**--**	**na**	**5.7E+06**
Bis 2-Ethylhexyl Phthalate[C]	0	--	--	na	2.2E+01	--	--	na	7.3E+04	--	--	na	2.2E+00	--	--	na	7.3E+03	**--**	**--**	**na**	**7.3E+03**
Bromoform [C]	0	--	--	na	1.4E+03	--	--	na	4.6E+06	--	--	na	1.4E+02	--	--	na	4.6E+05	**--**	**--**	**na**	**4.6E+05**
Butylbenzylphthalate	0	--	--	na	1.9E+03	--	--	na	1.7E+06	--	--	na	1.9E+02	--	--	na	1.7E+05	**--**	**--**	**na**	**1.7E+05**
Cadmium	0	8.2E-01	3.8E-01	na	--	2.7E+01	8.4E+01	na	--	2.1E-01	9.5E-02	na	--	3.4E+01	2.1E+01	na	--	**2.7E+01**	**2.1E+01**	**na**	**--**
Carbon Tetrachloride [C]	0	--	--	na	1.6E+01	--	--	na	5.3E+04	--	--	na	1.6E+00	--	--	na	5.3E+03	**--**	**--**	**na**	**5.3E+03**
Chlordane [C]	0	2.4E+00	4.3E-03	na	8.1E-03	8.0E+01	9.4E-01	na	2.7E+01	6.0E-01	1.1E-03	na	8.1E-04	9.8E+01	2.4E-01	na	2.7E+00	**8.0E+01**	**2.4E-01**	**na**	**2.7E+00**
Chloride	0	8.6E+05	2.3E+05	na	--	2.9E+07	5.1E+07	na	--	2.2E+05	5.8E+04	na	--	3.5E+07	1.3E+07	na	--	**2.9E+07**	**1.3E+07**	**na**	**--**
TRC	0	1.9E+01	1.1E+01	na	--	6.4E+02	2.4E+03	na	--	4.8E+00	2.8E+00	na	--	7.8E+02	6.0E+02	na	--	**6.4E+02**	**6.0E+02**	**na**	**--**
Chlorobenzene	0	--	--	na	1.6E+03	--	--	na	1.4E+06	--	--	na	1.6E+02	--	--	na	1.4E+05	**--**	**--**	**na**	**1.4E+05**

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	--	--	na	1.3E+02	--	--	na	4.3E+05	--	--	na	1.3E+01	--	--	na	4.3E+04	**--**	**--**	**na**	**4.3E+04**
Chloroform	0	--	--	na	1.1E+04	--	--	na	9.6E+06	--	--	na	1.1E+03	--	--	na	9.6E+05	**--**	**--**	**na**	**9.6E+05**
2-Chloronaphthalene	0	--	--	na	1.6E+03	--	--	na	1.4E+06	--	--	na	1.6E+02	--	--	na	1.4E+05	**--**	**--**	**na**	**1.4E+05**
2-Chlorophenol	0	--	--	na	1.5E+02	--	--	na	1.3E+05	--	--	na	1.5E+01	--	--	na	1.3E+04	**--**	**--**	**na**	**1.3E+04**
Chlorpyrifos	0	8.3E-02	4.1E-02	na	--	2.8E+00	9.0E+00	na	--	2.1E-02	1.0E-02	na	--	3.4E+00	2.3E+00	na	--	**2.8E+00**	**2.3E+00**	**na**	**--**
Chromium III	0	1.8E+02	2.4E+01	na	--	6.1E+03	5.2E+03	na	--	4.6E+01	6.0E+00	na	--	7.5E+03	1.3E+03	na	--	**6.1E+03**	**1.3E+03**	**na**	**--**
Chromium VI	0	1.6E+01	1.1E+01	na	--	5.4E+02	2.4E+03	na	--	4.0E+00	2.8E+00	na	--	6.5E+02	6.0E+02	na	--	**5.4E+02**	**6.0E+02**	**na**	**--**
Chromium, Total	0	--	--	1.0E+02	--	--	--	na	--	--	--	1.0E+01	--	--	--	8.8E+03	--	**--**	**--**	**na**	**--**
Chrysene [C]	0	--	--	na	1.8E-02	--	--	na	6.0E+01	--	--	na	1.8E-03	--	--	na	6.0E+00	**--**	**--**	**na**	**6.0E+00**
Copper	0	3.6E+00	2.7E+00	na	--	1.2E+02	6.0E+02	na	--	9.1E-01	6.8E-01	na	--	1.5E+02	1.5E+02	na	--	**1.2E+02**	**1.5E+02**	**na**	**--**
Cyanide, Free	0	2.2E+01	5.2E+00	na	1.6E+04	7.4E+02	1.1E+03	na	1.4E+07	5.5E+00	1.3E+00	na	1.6E+03	9.0E+02	2.9E+02	na	1.4E+06	**7.4E+02**	**2.9E+02**	**na**	**1.4E+06**
DDD [C]	0	--	--	na	3.1E-03	--	--	na	1.0E+01	--	--	na	3.1E-04	--	--	na	1.0E+00	**--**	**--**	**na**	**1.0E+00**
DDE [C]	0	--	--	na	2.2E-03	--	--	na	7.3E+00	--	--	na	2.2E-04	--	--	na	7.3E-01	**--**	**--**	**na**	**7.3E-01**
DDT [C]	0	1.1E+00	1.0E-03	na	2.2E-03	3.7E+01	2.2E-01	na	7.3E+00	2.8E-01	2.5E-04	na	2.2E-04	4.5E+01	5.5E-02	na	7.3E-01	**3.7E+01**	**5.5E-02**	**na**	**7.3E-01**
Demeton	0	--	1.0E-01	na	--	--	2.2E+01	na	--	--	2.5E-02	na	--	--	5.5E+00	na	--	**--**	**5.5E+00**	**na**	**--**
Diazinon	0	1.7E-01	1.7E-01	na	--	5.7E+00	3.7E+01	na	--	4.3E-02	4.3E-02	na	--	6.9E+00	9.3E+00	na	--	**5.7E+00**	**9.3E+00**	**na**	**--**
Dibenz(a,h)anthracene [C]	0	--	--	na	1.8E-01	--	--	na	6.0E+02	--	--	na	1.8E-02	--	--	na	6.0E+01	**--**	**--**	**na**	**6.0E+01**
1,2-Dichlorobenzene	0	--	--	na	1.3E+03	--	--	na	1.1E+06	--	--	na	1.3E+02	--	--	na	1.1E+05	**--**	**--**	**na**	**1.1E+05**
1,3-Dichlorobenzene	0	--	--	na	9.6E+02	--	--	na	8.4E+05	--	--	na	9.6E+01	--	--	na	8.4E+04	**--**	**--**	**na**	**8.4E+04**
1,4-Dichlorobenzene	0	--	--	na	1.9E+02	--	--	na	1.7E+05	--	--	na	1.9E+01	--	--	na	1.7E+04	**--**	**--**	**na**	**1.7E+04**
3,3-Dichlorobenzidine[C]	0	--	--	na	2.8E-01	--	--	na	9.3E+02	--	--	na	2.8E-02	--	--	na	9.3E+01	**--**	**--**	**na**	**9.3E+01**
Dichlorobromomethane [C]	0	--	--	na	1.7E+02	--	--	na	5.6E+05	--	--	na	1.7E+01	--	--	na	5.6E+04	**--**	**--**	**na**	**5.6E+04**
1,2-Dichloroethane [C]	0	--	--	na	3.7E+02	--	--	na	1.2E+06	--	--	na	3.7E+01	--	--	na	1.2E+05	**--**	**--**	**na**	**1.2E+05**
1,1-Dichloroethylene	0	--	--	na	7.1E+03	--	--	na	6.2E+06	--	--	na	7.1E+02	--	--	na	6.2E+05	**--**	**--**	**na**	**6.2E+05**
1,2-trans-dichloroethylene	0	--	--	na	1.0E+04	--	--	na	8.8E+06	--	--	na	1.0E+03	--	--	na	8.8E+05	**--**	**--**	**na**	**8.8E+05**
2,4-Dichlorophenol	0	--	--	na	2.9E+02	--	--	na	2.5E+05	--	--	na	2.9E+01	--	--	na	2.5E+04	**--**	**--**	**na**	**2.5E+04**
2,4-Dichlorophenoxy acetic acid (2,4-D)	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	**--**	**--**	**na**	**--**
1,2-Dichloropropane[C]	0	--	--	na	1.5E+02	--	--	na	5.0E+05	--	--	na	1.5E+01	--	--	na	5.0E+04	**--**	**--**	**na**	**5.0E+04**
1,3-Dichloropropene [C]	0	--	--	na	2.1E+02	--	--	na	7.0E+05	--	--	na	2.1E+01	--	--	na	7.0E+04	**--**	**--**	**na**	**7.0E+04**
Dieldrin [C]	0	2.4E-01	5.6E-02	na	5.4E-04	8.0E+00	1.2E+01	na	1.8E+00	6.0E-02	1.4E-02	na	5.4E-05	9.8E+00	3.1E+00	na	1.8E-01	**8.0E+00**	**3.1E+00**	**na**	**1.8E-01**
Diethyl Phthalate	0	--	--	na	4.4E+04	--	--	na	3.9E+07	--	--	na	4.4E+03	--	--	na	3.9E+06	**--**	**--**	**na**	**3.9E+06**
2,4-Dimethylphenol	0	--	--	na	8.5E+02	--	--	na	7.4E+05	--	--	na	8.5E+01	--	--	na	7.4E+04	**--**	**--**	**na**	**7.4E+04**
Dimethyl Phthalate	0	--	--	na	1.1E+06	--	--	na	9.6E+08	--	--	na	1.1E+05	--	--	na	9.6E+07	**--**	**--**	**na**	**9.6E+07**
Di-n-Butyl Phthalate	0	--	--	na	4.5E+03	--	--	na	3.9E+06	--	--	na	4.5E+02	--	--	na	3.9E+05	**--**	**--**	**na**	**3.9E+05**
2,4 Dinitrophenol	0	--	--	na	5.3E+03	--	--	na	4.6E+06	--	--	na	5.3E+02	--	--	na	4.6E+05	**--**	**--**	**na**	**4.6E+05**
2-Methyl-4,6-Dinitrophenol	0	--	--	na	2.8E+02	--	--	na	2.5E+05	--	--	na	2.8E+01	--	--	na	2.5E+04	**--**	**--**	**na**	**2.5E+04**
2,4-Dinitrotoluene [C]	0	--	--	na	3.4E+01	--	--	na	1.1E+05	--	--	na	3.4E+00	--	--	na	1.1E+04	**--**	**--**	**na**	**1.1E+04**
Dioxin 2,3,7,8-tetrachlorodibenzo-p-dioxin	0	--	--	na	5.1E-08	--	--	na	4.5E-05	--	--	na	5.1E-09	--	--	na	4.5E-06	**--**	**--**	**na**	**4.5E-06**
1,2-Diphenylhydrazine[C]	0	--	--	na	2.0E+00	--	--	na	6.6E+03	--	--	na	2.0E-01	--	--	na	6.6E+02	**--**	**--**	**na**	**6.6E+02**
Alpha-Endosulfan	0	2.2E-01	5.6E-02	na	8.9E+01	7.4E+00	1.2E+01	na	7.8E+04	5.5E-02	1.4E-02	na	8.9E+00	9.0E+00	3.1E+00	na	7.8E+03	**7.4E+00**	**3.1E+00**	**na**	**7.8E+03**
Beta-Endosulfan	0	2.2E-01	5.6E-02	na	8.9E+01	7.4E+00	1.2E+01	na	7.8E+04	5.5E-02	1.4E-02	na	8.9E+00	9.0E+00	3.1E+00	na	7.8E+03	**7.4E+00**	**3.1E+00**	**na**	**7.8E+03**
Alpha + Beta Endosulfan	0	2.2E-01	5.6E-02	--	--	7.4E+00	1.2E+01	--	--	5.5E-02	1.4E-02	--	--	9.0E+00	3.1E+00	--	--	**7.4E+00**	**3.1E+00**	**--**	**--**
Endosulfan Sulfate	0	--	--	na	8.9E+01	--	--	na	7.8E+04	--	--	na	8.9E+00	--	--	na	7.8E+03	**--**	**--**	**na**	**7.8E+03**
Endrin	0	8.6E-02	3.6E-02	na	6.0E-02	2.9E+00	7.9E+00	na	5.3E+01	2.2E-02	9.0E-03	na	6.0E-03	3.5E+00	2.0E+00	na	5.3E+00	**2.9E+00**	**2.0E+00**	**na**	**5.3E+00**
Endrin Aldehyde	0	--	--	na	3.0E-01	--	--	na	2.6E+02	--	--	na	3.0E-02	--	--	na	2.6E+01	**--**	**--**	**na**	**2.6E+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**
Ethylbenzene	0	--	--	na	2.1E+03	--	--	na	1.8E+06	--	--	na	2.1E+02	--	--	na	1.8E+05	**--**	**--**	**na**	**1.8E+05**
Fluoranthene	0	--	--	na	1.4E+02	--	--	na	1.2E+05	--	--	na	1.4E+01	--	--	na	1.2E+04	**--**	**--**	**na**	**1.2E+04**
Fluorene	0	--	--	na	5.3E+03	--	--	na	4.6E+06	--	--	na	5.3E+02	--	--	na	4.6E+05	**--**	**--**	**na**	**4.6E+05**
Foaming Agents	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	**--**	**--**	**na**	**--**
Guthion	0	--	1.0E-02	na	--	--	2.2E+00	na	--	--	2.5E-03	na	--	--	5.5E-01	na	--	**--**	**5.5E-01**	**na**	**--**
Heptachlor [C]	0	5.2E-01	3.8E-03	na	7.9E-04	1.7E+01	8.4E-01	na	2.6E+00	1.3E-01	9.5E-04	na	7.9E-05	2.1E+01	2.1E-01	na	2.6E-01	**1.7E+01**	**2.1E-01**	**na**	**2.6E-01**
Heptachlor Epoxide[C]	0	5.2E-01	3.8E-03	na	3.9E-04	1.7E+01	8.4E-01	na	1.3E+00	1.3E-01	9.5E-04	na	3.9E-05	2.1E+01	2.1E-01	na	1.3E-01	**1.7E+01**	**2.1E-01**	**na**	**1.3E-01**
Hexachlorobenzene[C]	0	--	--	na	2.9E-03	--	--	na	9.6E+00	--	--	na	2.9E-04	--	--	na	9.6E-01	**--**	**--**	**na**	**9.6E-01**
Hexachlorobutadiene[C]	0	--	--	na	1.8E+02	--	--	na	6.0E+05	--	--	na	1.8E+01	--	--	na	6.0E+04	**--**	**--**	**na**	**6.0E+04**
Hexachlorocyclohexane Alpha-BHC[C]	0	--	--	na	4.9E-02	--	--	na	1.6E+02	--	--	na	4.9E-03	--	--	na	1.6E+01	**--**	**--**	**na**	**1.6E+01**
Hexachlorocyclohexane Beta-BHC[C]	0	--	--	na	1.7E-01	--	--	na	5.6E+02	--	--	na	1.7E-02	--	--	na	5.6E+01	**--**	**--**	**na**	**5.6E+01**
Hexachlorocyclohexane Gamma-BHC[C] (Lindane)	0	9.5E-01	na	na	1.8E+00	3.2E+01	--	na	6.0E+03	2.4E-01	--	na	1.8E-01	3.9E+01	--	na	6.0E+02	**3.2E+01**	**--**	**na**	**6.0E+02**
Hexachlorocyclopentadiene	0	--	--	na	1.1E+03	--	--	na	9.6E+05	--	--	na	1.1E+02	--	--	na	9.6E+04	**--**	**--**	**na**	**9.6E+04**
Hexachloroethane[C]	0	--	--	na	3.3E+01	--	--	na	1.1E+05	--	--	na	3.3E+00	--	--	na	1.1E+04	**--**	**--**	**na**	**1.1E+04**
Hydrogen Sulfide	0	--	2.0E+00	na	--	--	4.4E+02	na	--	--	5.0E-01	na	--	--	1.1E+02	na	--	**--**	**1.1E+02**	**na**	**--**
Indeno (1,2,3-cd) pyrene [C]	0	--	--	na	1.8E-01	--	--	na	6.0E+02	--	--	na	1.8E-02	--	--	na	6.0E+01	**--**	**--**	**na**	**6.0E+01**
Iron	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	**--**	**--**	**na**	**--**
Isophorone[C]	0	--	--	na	9.6E+03	--	--	na	3.2E+07	--	--	na	9.6E+02	--	--	na	3.2E+06	**--**	**--**	**na**	**3.2E+06**
Kepone	0	--	0.0E+00	na	--	--	0.0E+00	na	--	--	0.0E+00	na	--	--	0.0E+00	na	--	**--**	**0.0E+00**	**na**	**--**
Lead	0	2.0E+01	2.3E+00	na	--	6.8E+02	5.1E+02	na	--	5.1E+00	5.8E-01	na	--	8.3E+02	1.3E+02	na	--	**6.8E+02**	**1.3E+02**	**na**	**--**
Malathion	0	--	1.0E-01	na	--	--	2.2E+01	na	--	--	2.5E-02	na	--	--	5.5E+00	na	--	**--**	**5.5E+00**	**na**	**--**
Manganese	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	**--**	**--**	**na**	**--**
Mercury	0	1.4E+00	7.7E-01	- -	- -	4.7E+01	1.7E+02	- -	- -	3.5E-01	1.9E-01	- -	--	5.7E+01	4.2E+01	- -	--	**4.7E+01**	**4.2E+01**	**- -**	**- -**
Methyl Bromide	0	--	--	na	1.5E+03	--	--	na	1.3E+06	--	--	na	1.5E+02	--	--	na	1.3E+05	**--**	**--**	**na**	**1.3E+05**
Methylene Chloride [C]	0	--	--	na	5.9E+03	--	--	na	2.0E+07	--	--	na	5.9E+02	--	--	na	2.0E+06	**--**	**--**	**na**	**2.0E+06**
Methoxychlor	0	--	3.0E-02	na	--	--	6.6E+00	na	--	--	7.5E-03	na	--	--	1.6E+00	na	--	**--**	**1.6E+00**	**na**	**--**
Mirex	0	--	0.0E+00	na	--	--	0.0E+00	na	--	--	0.0E+00	na	--	--	0.0E+00	na	--	**--**	**0.0E+00**	**na**	**--**
Nickel	0	5.6E+01	6.3E+00	na	4.6E+03	1.9E+03	1.4E+03	na	4.0E+06	1.4E+01	1.6E+00	na	4.6E+02	2.3E+03	3.4E+02	na	4.0E+05	**1.9E+03**	**3.4E+02**	**na**	**4.0E+05**
Nitrate (as N)	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	**--**	**--**	**na**	**--**
Nitrobenzene	0	--	--	na	6.9E+02	--	--	na	6.0E+05	--	--	na	6.9E+01	--	--	na	6.0E+04	**--**	**--**	**na**	**6.0E+04**
N-Nitrosodimethylamine[C]	0	--	--	na	3.0E+01	--	--	na	9.9E+04	--	--	na	3.0E+00	--	--	na	9.9E+03	**--**	**--**	**na**	**9.9E+03**
N-Nitrosodiphenylamine[C]	0	--	--	na	6.0E+01	--	--	na	2.0E+05	--	--	na	6.0E+00	--	--	na	2.0E+04	**--**	**--**	**na**	**2.0E+04**
N-Nitrosodi-n-propylamine[C]	0	--	--	na	5.1E+00	--	--	na	1.7E+04	--	--	na	5.1E-01	--	--	na	1.7E+03	**--**	**--**	**na**	**1.7E+03**
Nonylphenol	0	2.8E+01	6.6E+00	--	--	9.4E+02	1.5E+03	na	--	7.0E+00	1.7E+00	--	--	1.1E+03	3.6E+02	--	--	**9.4E+02**	**3.6E+02**	**na**	**--**
Parathion	0	6.5E-02	1.3E-02	na	--	2.2E+00	2.9E+00	na	--	1.6E-02	3.3E-03	na	--	2.7E+00	7.1E-01	na	--	**2.2E+00**	**7.1E-01**	**na**	**--**
PCB Total[C]	0	--	1.4E-02	na	6.4E-04	--	3.1E+00	na	2.1E+00	--	3.5E-03	na	6.4E-05	--	7.7E-01	na	2.1E-01	**--**	**7.7E-01**	**na**	**2.1E-01**
Pentachlorophenol [C]	0	5.3E+00	4.1E+00	na	3.0E+01	1.8E+02	8.9E+02	na	9.9E+04	1.3E+00	1.0E+00	na	3.0E+00	2.2E+02	2.2E+02	na	9.9E+03	**1.8E+02**	**2.2E+02**	**na**	**9.9E+03**
Phenol	0	--	--	na	8.6E+05	--	--	na	7.5E+08	--	--	na	8.6E+04	--	--	na	7.5E+07	**--**	**--**	**na**	**7.5E+07**
Pyrene	0	--	--	na	4.0E+03	--	--	na	3.5E+06	--	--	na	4.0E+02	--	--	na	3.5E+05	**--**	**--**	**na**	**3.5E+05**
Radionuclides	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	**--**	**--**	**na**	**--**
Gross Alpha Activity (pCi/L)	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	**--**	**--**	**na**	**--**
Beta and Photon Activity (mrem/yr)	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	**--**	**--**	**na**	**--**
Radium 226 + 228 (pCi/L)	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	**--**	**--**	**na**	**--**
Uranium (ug/l)	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	**--**	**--**	**na**	**--**

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	na	4.2E+03	6.7E+02	1.1E+03	na	3.7E+06	5.0E+00	1.3E+00	na	4.2E+02	8.2E+02	2.7E+02	na	3.7E+05	**6.7E+02**	**2.7E+02**	**na**	**3.7E+05**
Silver	0	3.2E-01	--	na	--	1.1E+01	--	na	--	7.9E-02	--	na	--	1.3E+01	--	na	--	**1.1E+01**	**--**	**na**	**--**
Sulfate	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	**--**	**--**	**na**	**--**
1,1,2,2-Tetrachloroethane[C]	0	--	--	na	4.0E+01	--	--	na	1.3E+05	--	--	na	4.0E+00	--	--	na	1.3E+04	**--**	**--**	**na**	**1.3E+04**
Tetrachloroethylene[C]	0	--	--	na	3.3E+01	--	--	na	1.1E+05	--	--	na	3.3E+00	--	--	na	1.1E+04	**--**	**--**	**na**	**1.1E+04**
Thallium	0	--	--	na	4.7E-01	--	--	na	4.1E+02	--	--	na	4.7E-02	--	--	na	4.1E+01	**--**	**--**	**na**	**4.1E+01**
Toluene	0	--	--	na	6.0E+03	--	--	na	5.3E+06	--	--	na	6.0E+02	--	--	na	5.3E+05	**--**	**--**	**na**	**5.3E+05**
Total dissolved solids	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	**--**	**--**	**na**	**--**
Toxaphene [C]	0	7.3E-01	2.0E-04	na	2.8E-03	2.4E+01	4.4E-02	na	9.3E+00	1.8E-01	5.0E-05	na	2.8E-04	3.0E+01	1.1E-02	na	9.3E-01	**2.4E+01**	**1.1E-02**	**na**	**9.3E-01**
Tributyltin	0	4.6E-01	7.2E-02	na	--	1.5E+01	1.6E+01	na	--	1.2E-01	1.8E-02	na	--	1.9E+01	4.0E+00	na	--	**1.5E+01**	**4.0E+00**	**na**	**--**
1,2,4-Trichlorobenzene	0	--	--	na	7.0E+01	--	--	na	6.1E+04	--	--	na	7.0E+00	--	--	na	6.1E+03	**--**	**--**	**na**	**6.1E+03**
1,1,2-Trichloroethane[C]	0	--	--	na	1.6E+02	--	--	na	5.3E+05	--	--	na	1.6E+01	--	--	na	5.3E+04	**--**	**--**	**na**	**5.3E+04**
Trichloroethylene [C]	0	--	--	na	3.0E+02	--	--	na	9.9E+05	--	--	na	3.0E+01	--	--	na	9.9E+04	**--**	**--**	**na**	**9.9E+04**
2,4,6-Trichlorophenol [C]	0	--	--	na	2.4E+01	--	--	na	8.0E+04	--	--	na	2.4E+00	--	--	na	8.0E+03	**--**	**--**	**na**	**8.0E+03**
2-(2,4,5-Trichlorophenoxy) propionic acid (Silvex)	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	**--**	**--**	**na**	**--**
Vinyl Chloride[C]	0	--	--	na	2.4E+01	--	--	na	8.0E+04	--	--	na	2.4E+00	--	--	na	8.0E+03	**--**	**--**	**na**	**8.0E+03**
Zinc	0	3.6E+01	3.6E+01	na	2.6E+04	1.2E+03	8.0E+03	na	2.3E+07	9.1E+00	9.1E+00	na	2.6E+03	1.5E+03	2.0E+03	na	2.3E+06	**1.2E+03**	**2.0E+03**	**na**	**2.3E+06**

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+04
Arsenic	4.6E+03
Barium	na
Cadmium	1.1E+01
Chromium III	7.8E+02
Chromium VI	2.1E+02
Copper	4.9E+01
Iron	na
Lead	7.6E+01
Manganese	na
Mercury	1.9E+01
Nickel	2.1E+02
Selenium	1.6E+02
Silver	4.3E+00
Zinc	4.8E+02

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

MSTRANTI DATA SOURCE REPORT

Stream information	
Mean Hardness	Ambient monitoring data (Attachment C)
90% Temperature (annual)	Ambient monitoring data (Attachment C)
90% Maximum pH	Ambient monitoring data (Attachment C)
10% Maximum pH	Ambient monitoring data (Attachment C)
Tier Designation	Tier Determination (Item 14 in Fact Sheet)
Stream Flows	
All Data	See flow frequencies (Item 5 in Fact Sheet)
Mixing Information	
All Data	Mix.exe concluded that a complete mix is appropriate. (Attachment G)
Effluent Information	
Mean Hardness	Assumed conservative value used in the absence of actual data equals the minimum hardness allowed for use by the Virginia Water Quality Standards.
90% Temperature	The minimal temperature data provided in the application is significantly below the 90% temperature observed in the neighboring Nottoway River. Because an open-air, shallow lagoon is expected to be equal to or higher than ambient conditions, an assumed and expected 90% temperature value was used.
90% Maximum pH	Effluent DMR Data, see Attachment E.
10% Maximum pH	Effluent DMR Data, see Attachment E.
Discharge flow	Design flow obtained from permit application.

Mixing Zone Predictions for Nottoway Motel and Restaurant

Effluent Flow = .016 MGD
Stream 7Q10 = 3.5 MGD
Stream 30Q10 = 8.3 MGD
Stream 1Q10 = 2.6 MGD
Stream slope = 0.00038 ft/ft
Stream width = 40 ft
Bottom scale = 2
Channel scale = 1

Mixing Zone Predictions @ 7Q10

Depth = .5611 ft
Length = 3337.87 ft
Velocity = .2425 ft/sec
Residence Time = .1593 days

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

Mixing Zone Predictions @ 30Q10

Depth = .9476 ft
Length = 2130.35 ft
Velocity = .3396 ft/sec
Residence Time = .0726 days

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

Mixing Zone Predictions @ 1Q10

Depth = .4691 ft
Length = 3886.99 ft
Velocity = .2158 ft/sec
Residence Time = 5.0027 hours

Recommendation:
A complete mix assumption is appropriate for this situation providing no more than 19.99% of the 1Q10 is used.

Virginia DEQ Mixing Zone Analysis Version 2.1

Facility = Nottoway Motel and Restaurant
Chemical = Ammonia
Chronic averaging period = 30
WLAa = 666
WLAc = 277
Q.L. = 1
# 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

No Limit is required for this material

The data are: 9

Chemical = TRC
Chronic averaging period = 4
WLAa = 640
WLAc = 600
Q.L. = 1
# samples/mo. = 30
# samples/wk. = 7

Summary of Statistics:
observations = 1
Expected Value = 20000
Variance = 1440000
C.V. = 0.6
97th percentile daily values = 48668.3
97th percentile 4 day average = 33275.8
97th percentile 30 day average= 24121.0
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

A limit is needed based on Acute Toxicity
Maximum Daily Limit = 640
Average Weekly limit = 390.852612321298
Average Monthly LImit = 317.197544875315

The data are: 20000

ATTACHMENT E

Threatened and Endangered Species Reviews

Molly Joseph Ward
Secretary of Natural Resources

Clyde E. Cristman
Director

COMMONWEALTH of VIRGINIA

DEPARTMENT OF CONSERVATION AND RECREATION

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

May 27, 2014

Brad Ricks
DEQ – Piedmont Regional Office
4949-A Cox Road
Glen Allen, VA 23060

Re: VA0028291, Nottoway Motel and Restaurant Permit Modification

Dear Mr. Ricks:

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 Nottoway River – Sturgeon Creek – Hardwood Creek Stream Conservation Unit (SCU) is located within the project site. SCUs identify stream reaches that contain aquatic natural heritage resources, including 2 miles upstream and 1 mile downstream of documented occurrences, and all tributaries within this reach. SCUs are also given a biodiversity significance ranking based on the rarity, quality, and number of element occurrences they contain. The Nottoway River – Sturgeon Creek – Hardwood Creek SCU has been given a biodiversity ranking of B1, which represents a site of outstanding significance. The natural heritage resources associated with this site are:

Elliptio lanceolata	Yellow lance	G2G3/S2S3/SOC/NL
Fusconaia masoni	Atlantic pigtoe	G2/S2/SOC/LT
Lampsilis cariosa	Yellow lampmussel	G3G4/S2/NL/NL
Lampsilis radiata	Eastern lampmussel	G5/S2S3/NL/NL
Percina rex	Roanoke logperch	G1G2/S1S2/LE/LE

In addition, Nottoway River and Waqua Creek have been designated by the Virginia Department of Game and Inland Fisheries (VDGIF) as "Threatened and Endangered Species Waters." The species associated with Nottoway River T & E Water are the Roanoke logperch, Atlantic pigtoe, and Dwarf wedgemussel (*Alasmidonta heterodon*, G1G2/S1/LE/LE). The species associated with Waqua Creek T & E Water is Roanoke logperch.

To minimize impacts to aquatic resources, DCR supports the use of uv/ozone to replace chlorination disinfection and utilization of new technologies as they become available to improve water quality. Due to the presence of freshwater mussels, DCR recommends adoption of the EPA ammonia limits to be protective of mussels. Due to the legal status of several of the species listed above, DCR also recommends coordination with the U.S. Fish and

Wildlife Service (USFWS) and 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.

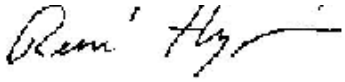
Under a Memorandum of Agreement established between the Virginia Department of Agriculture and Consumer Services (VDACS) and the DCR, DCR represents VDACS in comments regarding potential impacts on state-listed threatened and endangered plant and insect species. The current activity will not affect any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

New and updated information is continually added to Biotics. Please re-submit project information and map for an update on this natural heritage information if the scope of the project changes and/or six months has passed 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: Troy Andersen, USFWS
Ernie Aschenbach, VDGIF

Ricks, Bradford (DEQ)

From: Aschenbach, Ernie (DGIF)
Sent: Friday, June 27, 2014 4:28 PM
To: Ricks, Bradford (DEQ); nhreview (DCR); Hillman, Brett
Cc: ProjectReview (DGIF); Cason, Gladys (DGIF)
Subject: ESSLog 32705; VPDES Permit VA0028291 Modification for the Nottoway Motel and Restaurant Sewage Treatment Plant in Brunswick County, VA

We support the upgrading of the facility to allow substitution of Ultraviolet disinfection for existing disinfection via chlorination, as proposed. We reiterate the remainder of our 2012 recommendations.

According to our records the receiving stream, Nottoway River, is a designated Threatened and Endangered (T&E) species water for the federal Endangered state Endangered (FESE) Roanoke logperch and FESE dwarf wedgemussel. Freshwater mussels are known to be sensitive to ammonia. The ammonia limits within the 2013 EPA rule are the best information currently available regarding ammonia levels protective of mussels (not T&E mussels, any mussel species). We reiterate our recommendation that the EPA values being implemented in this permit for this and all future VPDES permits, if practicable.

This project is located within 2 miles of a documented occurrence of a state or federal threatened or endangered plant or insect species and/or other Natural Heritage coordination species. Therefore, we recommend and support coordination with VDCR-DNH regarding the protection of these resources. We also recommend contacting the USFWS regarding all federally listed species.

Thank you for the opportunity to provide comments. Please call me if you have any questions.

Ernie Aschenbach
Environmental Services Biologist
Virginia Dept. of Game and Inland Fisheries
P.O. Box 11104
4010 West Broad Street
Richmond, VA 23230
Phone: (804) 367-2733
FAX: (804) 367-2427
Email: Ernie.Aschenbach@dgif.virginia.gov

From: Ricks, Bradford (DEQ)
Sent: Thursday, May 01, 2014 2:59 PM
To: Baird, Alice (DCR); ProjectReview (DGIF); Hillman, Brett
Cc: Hypes, Rene (DCR); cindy_kane@fws.gov
Subject: Permit Modification

All,

I received comments on the attached inquiry associated with 2012 reissuance of VPDES Permit No. VA0028291 which discharges to the Nottoway River in Brunswick Co., VA.

The facility has requested a permit modification to increase design flow from 0.016 MGD to 0.020 MGD with the construction of a new plant, including replacement of chlorine disinfection with UV. At this point, I do not expect effluent limitations to change with the increased flow aside from removal of TRC.

Please let me know if you would like to review and/or comment on the proposed modification. If so, I will send any additional information needed.

Sincerely,

Brad Ricks
VPDES Permits
DEQ - Piedmont Regional Office
804 527 5129

Seavey, Eric (DEQ)

From: Hillman, Brett [brett_hillman@fws.gov]
Sent: Wednesday, May 14, 2014 10:15 AM
To: Ricks, Bradford (DEQ)
Cc: ProjectReview (DGIF); nhreview (DCR)
Subject: Nottoway Motel and Restaurant STP VA0028291 (permit mod) - USFWS Comments
Attachments: 20120514_Letter_Service to VPDES_Nottoway Motel & Restaurant Sewage Treatment Plant, Warfield.pdf

Hi Brad,

Thanks for providing us with the opportunity to comment on this proposed permit modification. In our May 14, 2012 comment letter regarding the re-issuance of this permit (attached), we noted that the federally listed endangered dwarf wedgemussel (*Alasmidonta heterodon*) and Roanoke logperch (*Percina rex*) occur downstream of the point of discharge in the Nottoway River. We were concerned about the potential for ammonia to negatively impact the dwarf wedgemussel. We recommended that the EPA 2009 Draft Ammonia Criteria be used to determine whether or not ammonia limits are required. These criteria have since been fine tuned and were published by the EPA in August of 2013.

We believe that that 2013 EPA Ammonia Criteria are protective of freshwater mussels and should now be used to determine if ammonia limits are required for this discharge. If they are not used, then we can not conclude that the permit is protective of the dwarf wedgemussel.

On another note, we commend the facility for switching from chlorine to UV disinfection. This will decrease the concentration of chlorine in the discharge and should result in a discharge that is more favorable to both the dwarf wedgemussel and Roanoke logperch.

If you have any questions or comments, please don't hesitate to contact me.

Best,
Brett

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

Phone: 804-824-2420
Fax: 804-693-9032
Email: brett_hillman@fws.gov

Seavey, Eric (DEQ)

From: Ricks, Bradford (DEQ)
Sent: Monday, June 02, 2014 8:53 AM
To: nhreview (DCR)
Subject: RE: VA0028291, Nottoway Motel and Restaurant Permit Modification

Ms. Hypes,

Thank you for your comments on this proposed permit modification.

Specific to your recommendation that DEQ adopt EPA ammonia criteria to be protective of freshwater mussels, DEQ currently uses the Virginia Water Quality Standards effective January 6, 2011, adopted by the State Water Control Board and approved by EPA to determine VPDES effluent limitations that are protective of human health and the environment. These standards are updated on a regular basis through triennial review to incorporate new information applicable to Virginia. The reasonable potential analysis used to determine effluent limitations applicable to this proposed modification is conducted based on the current Virginia Water Quality Standards. Existing ammonia criteria are established to meet the requirement of 9VAC25-260-20.A that "State waters be free from substances attributable to sewage in concentrations, amounts, or combinations which...are inimical or harmful to human, animal, plant, or aquatic life." Revised federal ammonia criteria is expected to be properly addressed as part of the Water Quality Standards triennial review process. Following that regular review process, any adopted revisions to the Virginia Water Quality Standards regulation will be incorporated in future permit actions. The current permit term expires in June 2017.

DEQ believes that effluent discharged from this facility meets the requirements of the Water Quality Standards and the VPDES permit regulation and therefore does not violate either the federal Endangered Species Act or the Virginia Endangered Species Act.

As recommended, DEQ has also coordinated this review with USFWS and VDGIF.

Sincerely,

Brad Ricks
VPDES Permits
(804)527-5129

From: nhreview (DCR)
Sent: Tuesday, May 27, 2014 4:35 PM
To: Ricks, Bradford (DEQ)
Cc: ProjectReview (DGIF); 'troy_andersen@fws.gov'
Subject: VA0028291, Nottoway Motel and Restaurant Permit Modification

Mr. Bradford,

Please find attached the DCR-DNH comments for the above referenced project. The comments are in pdf format and can be printed for your records. Also species rank information is available at http://www.dcr.virginia.gov/natural_heritage/help.shtml for your reference.

Thank you for the opportunity to comment on this project.

Rene'

S. Rene' Hypes
Project Review Coordinator
Department of Conservation and Recreation
Division of Natural Heritage
600 East Main Street, 24th Floor

Richmond, Virginia 23219
804-371-2708 (phone)
804-371-2674 (fax)
rene.hypes@dcr.virginia.gov

VIRGINIA NATURAL HERITAGE PROGRAM

Conserving VA's Biodiversity through Inventory, Protection and Stewardship
www.dcr.virginia.gov/natural_heritage
Virginia Natural Heritage Program on Facebook

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Virginia Natural Heritage Program on Facebook

Seavey, Eric (DEQ)

From: Ricks, Bradford (DEQ)
Sent: Monday, June 02, 2014 11:32 AM
To: 'Hillman, Brett'
Subject: VA0028291, Nottoway Motel and Restaurant Permit Modification

Brett,

Thank you for your comments on this proposed permit modification.

Specific to your recommendation that DEQ adopt EPA ammonia criteria to develop effluent limits for the proposed discharge, DEQ currently uses the Virginia Water Quality Standards effective January 6, 2011, adopted by the State Water Control Board and approved by EPA to determine VPDES effluent limitations that are protective of human health and the environment. These standards are updated on a regular basis through triennial review to incorporate new information applicable to Virginia. The reasonable potential analysis used to determine effluent limitations applicable to this proposed modification is conducted based on the current Virginia Water Quality Standards and protocol established by guidance for developing permit limitations protective of these standards. Existing ammonia criteria are established to meet the requirement of 9VAC25-260-20.A that "State waters be free from substances attributable to sewage in concentrations, amounts, or combinations which...are inimical or harmful to human, animal, plant, or aquatic life." Revised federal ammonia criteria are expected to be properly addressed as part of the Water Quality Standards triennial review process. Following that regular review process, any adopted revisions to the Virginia Water Quality Standards regulation will be incorporated in future permit actions. The current permit term expires in June 2017.

DEQ believes that effluent discharged from this facility meets the requirements of the Water Quality Standards and the VPDES permit regulation and therefore does not violate either the federal Endangered Species Act or the Virginia Endangered Species Act.

Sincerely,

Brad Ricks
VPDES Permits
(804)527-5129

ATTACHMENT F

Stream Sanitation Memo

MEMORANDUM

DEPARTMENT OF ENVIRONMENTAL QUALITY
Piedmont Regional Office

4949-A Cox Road, Glen Allen, VA 23060-6296 **804/527-5020**

SUBJECT: Stream Sanitation Analysis – Nottoway River
Nottoway Motel & Restaurant STP (VA0028291)

TO: Brad Ricks

FROM: Jennifer Palmore, P.G.

DATE: June 9, 2014

COPIES: Kelley West, Model File

A request for a stream sanitation analysis for the Nottoway Motel & Restaurant sewage treatment plant was received. The permittee is upgrading their treatment process from a lagoon to a package plant and has requested an increase in their permitted design flow from 0.016 MGD to 0.020 MGD.

Background

The outfall discharges into an unnamed tributary of the Nottoway River in Brunswick County at rivermile 5AXHK000.03. The outfall is located between Route 1 and Interstate 85. Because of the proximity of the outfall to the Nottoway River, and because the tributary is located on the facility's property, the effluent limits are applied at the Nottoway River mainstem.

The facility currently has limits of BOD_5 = 30 mg/L and dissolved oxygen (minimum) = 6.0 mg/L. There is no record of a stream sanitation analysis in the file; therefore, the origin of these limits is uncertain.

Current Modeling Effort

Kelley West and I performed a site visit on June 5, 2014. Stream flows were derived by drainage area proportion from the Nottoway River near Rawlings, VA gage (#020444500). Stream temperatures for the Nottoway River were derived from station 5ANTW109.02, which is located at the Route 1 bridge approximately 0.19 mile upstream of the discharge. A default effluent temperature of 28°C was used. DEQ's Regional Water Quality Model for Free Flowing Streams Version 4.11 was used; the model is a steady-state Streeter-Phelps model and assumes complete mix. Modeling documentation is attached.

The Nottoway River is considered a Tier 2 water. Based on the model, the following limits will achieve a maximum 0.2 mg/L drop in dissolved oxygen, as mandated by the DEQ antidegradation policy:

Q = 0.020 MGD
$cBOD_5$ = 14 mg/L
TKN = 20 mg/L
DO = 5.0 mg/L

If you have any questions or need any additional information, please do not hesitate to contact me.

REGIONAL MODELING SYSTEM VERSION 4.0

Model Input File for the Discharge to NOTTOWAY RIVER.

File Information

File Name:	C:\Users\asf62171\Documents\models\Nottoway Motel & Restaurant.mod
Date Modified:	June 09, 2014

Water Quality Standards Information

Stream Name:	NOTTOWAY RIVER
River Basin:	Chowan River Basin
Section:	2b
Class:	III - Nontidal Waters (Coastal and Piedmont)
Special Standards:	none

Background Flow Information

Gauge Used:	Nottoway River near Rawlings, VA (#02044500)
Gauge Drainage Area:	317 Sq.Mi.
Gauge 7Q10 Flow:	3 MGD
Headwater Drainage Area:	356 Sq.Mi.
Headwater 7Q10 Flow:	3.369085 MGD (Net; includes Withdrawals/Discharges)
Withdrawal/Discharges:	0 MGD
Incremental Flow in Segments:	9.463723E-03 MGD/Sq.Mi.

Background Water Quality

Background Temperature:	25.6 Degrees C
Background cBOD5:	2 mg/l
Background TKN:	0 mg/l
Background D.O.:	7.388033 mg/l

Model Segmentation

Number of Segments:	2
Model Start Elevation:	159 ft above MSL
Model End Elevation:	143 ft above MSL

REGIONAL MODELING SYSTEM VERSION 4.0

Model Input File for the Discharge to NOTTOWAY RIVER.

Segment Information for Segment 1

Definition Information

Segment Definition:	A discharge enters.
Discharge Name:	NOTTOWAY MOTEL & RESTAURANT
VPDES Permit No.:	VA0028291

Discharger Flow Information

Flow:	0.02 MGD
cBOD5:	14 mg/l
TKN:	20 mg/l
D.O.:	5 mg/l
Temperature:	28 Degrees C

Geographic Information

Segment Length:	2.4 miles
Upstream Drainage Area:	356 Sq.Mi.
Downstream Drainage Area:	361 Sq.Mi.
Upstream Elevation:	159 Ft.
Downstream Elevation:	157 Ft.

Hydraulic Information

Segment Width:	50 Ft.
Segment Depth:	0.47 Ft.
Segment Velocity:	0.223 Ft./Sec.
Segment Flow:	3.389 MGD
Incremental Flow:	0.047 MGD (Applied at end of segment.)

Channel Information

Cross Section:	Rectangular
Character:	Mostly Straight
Pool and Riffle:	No
Bottom Type:	Sand
Sludge:	None
Plants:	None
Algae:	None

REGIONAL MODELING SYSTEM VERSION 4.0

Model Input File for the Discharge to NOTTOWAY RIVER.

Segment Information for Segment 2

Definition Information

Segment Definition:	A tributary enters.
Tributary Name:	WAQUA CREEK

Tributary Flow Information

Flow:	0.31 MGD
cBOD5:	2 mg/l
TKN:	0 mg/l
D.O.:	7.69 mg/l
Temperature:	23.2 Degrees C

Geographic Information

Segment Length:	3.1 miles
Upstream Drainage Area:	406 Sq.Mi.
Downstream Drainage Area:	413 Sq.Mi.
Upstream Elevation:	157 Ft.
Downstream Elevation:	143 Ft.

Hydraulic Information

Segment Width:	50 Ft.
Segment Depth:	0.238 Ft.
Segment Velocity:	0.332 Ft./Sec.
Segment Flow:	3.699 MGD
Incremental Flow:	0.066 MGD (Applied at end of segment.)

Channel Information

Cross Section:	Rectangular
Character:	Mostly Straight
Pool and Riffle:	No
Bottom Type:	Sand
Sludge:	None
Plants:	None
Algae:	None

"Model Run For C:\Users\asf62171\Documents\models\Nottoway Motel & Restaurant.mod On 6/9/2014 12:42:59 PM"

"Model is for NOTTOWAY RIVER."
"Model starts at the NOTTOWAY MOTEL & RESTAURANT discharge."

"Background Data"

"7Q10",	"cBOD5",	"TKN",	"DO",	"Temp"
"(mgd)",	"(mg/l)",	"(mg/l)",	"(mg/l)",	"deg C"
3.3691,	2,	0,	7.388,	25.6

"Discharge/Tributary Input Data for Segment 1"

"Flow",	"cBOD5",	"TKN",	"DO",	"Temp"
"(mgd)",	"(mg/l)",	"(mg/l)",	"(mg/l)",	"deg C"
.02,	14,	20,	,5,	28

"Hydraulic Information for Segment 1"

"Length",	"Width",	"Depth",	"Velocity"
"(mi)",	"(ft)",	"(ft)",	"(ft/sec)"
2.4,	50,	.47,	.223

"Initial Mix Values for Segment 1"

"Flow",	"DO",	"cBOD",	"nBOD",	"DOSat",	"Temp"
"(mgd)",	"(mg/l)",	"(mg/l)",	"(mg/l)",	"(mg/l)",	"deg C"
3.3891,	7.374,	5.177,	.434,	8.207,	25.61416

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

"k1",	"k1@T",	"k2",	"k2@T",	"kn",	"kn@T",	"BD",	"BD@T"
1,	1.294,	.5,	.571,	.35,	.539,	0,	0

"Output for Segment 1"
"Segment starts at NOTTOWAY MOTEL & RESTAURANT"

"Total" "Dist.",	"Segm." "Dist.",	"DO",	"cBOD",	"nBOD"
"(mi)",	"(mi)",	"(mg/l)",	"(mg/l)",	"(mg/l)"
0,	0,	7.374,	5.177,	.434
.1,	.1,	7.202,	5,	.428
.2,	.2,	7.211,	5,	.422
.3,	.3,	7.22,	5,	.416
.4,	.4,	7.229,	5,	.41
.5,	.5,	7.238,	5,	.404
.6,	.6,	7.247,	5,	.398
.7,	.7,	7.256,	5,	.392
.8,	.8,	7.265,	5,	.386
.9,	.9,	7.274,	5,	.38
1,	1,	7.283,	5,	.374
1.1,	1.1,	7.292,	5,	.369
1.2,	1.2,	7.301,	5,	.364
1.3,	1.3,	7.31,	5,	.359
1.4,	1.4,	7.319,	5,	.354
1.5,	1.5,	7.328,	5,	.349
1.6,	1.6,	7.337,	5,	.344
1.7,	1.7,	7.346,	5,	.339
1.8,	1.8,	7.354,	5,	.334
1.9,	1.9,	7.362,	5,	.329
2,	2,	7.37,	5,	.324
2.1,	2.1,	7.378,	5,	.319
2.2,	2.2,	7.386,	5,	.314
2.3,	2.3,	7.387,	5,	.309
2.4,	2.4,	7.387,	5,	.304

"Discharge/Tributary Input Data for Segment 2"

"Flow",	"cBOD5",	"TKN",	"DO",	"Temp"
"(mgd)",	"(mg/l)",	"(mg/l)",	"(mg/l)",	"deg C"
.31,	2,	0,	,7.69,	23.2

"Incremental Flow Input Data for Segment 2"

"Flow",	"cBOD5",	"TKN",	"DO",	"Temp"
"(mgd)",	"(mg/l)",	"(mg/l)",	"(mg/l)",	"deg C"
.047,	2,	0,	,7.412,	25.6

"Hydraulic Information for Segment 2"

"Length",	"Width",	"Depth",	"Velocity"
"(mi)",	"(ft)",	"(ft)",	"(ft/sec)"
3.1,	50,	.238,	.332

"Initial Mix Values for Segment 2"

"Flow",	"DO",	"cBOD",	"nBOD",	"DOSat",	"Temp"
"(mgd)",	"(mg/l)",	"(mg/l)",	"(mg/l)",	"(mg/l)",	"deg C"
3.7461,	7.412,	5,	.275,	8.236,	25.41421

"Rate Constants for Segment 2. - (All units Per Day)"

"k1",	"k1@T",	"k2",	"k2@T",	"kn",	"kn@T",	"BD",	"BD@T"
1,	1.282,	2.71,	3.081,	.35,	.531,	0,	0

"Output for Segment 2"
"Segment starts at WAQUA CREEK"

"Total",	"Segm."			
"Dist.",	"Dist.",	"DO",	"cBOD",	"nBOD"
"(mi)",	"(mi)",	"(mg/l)",	"(mg/l)",	"(mg/l)"
2.4,	0,	7.412,	5,	.275
2.5,	.1,	7.412,	5,	.272
2.6,	.2,	7.412,	5,	.269
2.7,	.3,	7.412,	5,	.266
2.8,	.4,	7.412,	5,	.263
2.9,	.5,	7.412,	5,	.26
3,	.6,	7.412,	5,	.257
3.1,	.7,	7.412,	5,	.255
3.2,	.8,	7.412,	5,	.253
3.3,	.9,	7.412,	5,	.251
3.4,	1,	7.412,	5,	.249
3.5,	1.1,	7.412,	5,	.247
3.6,	1.2,	7.412,	5,	.245
3.7,	1.3,	7.412,	5,	.243
3.8,	1.4,	7.412,	5,	.241
3.9,	1.5,	7.412,	5,	.239
4,	1.6,	7.412,	5,	.237
4.1,	1.7,	7.412,	5,	.235
4.2,	1.8,	7.412,	5,	.233
4.3,	1.9,	7.412,	5,	.231
4.4,	2,	7.412,	5,	.229
4.5,	2.1,	7.412,	5,	.227
4.6,	2.2,	7.412,	5,	.225
4.7,	2.3,	7.412,	5,	.223
4.8,	2.4,	7.412,	5,	.221
4.9,	2.5,	7.412,	5,	.219
5,	2.6,	7.412,	5,	.217
5.1,	2.7,	7.412,	5,	.215
5.2,	2.8,	7.412,	5,	.213
5.3,	2.9,	7.412,	5,	.211
5.4,	3,	7.412,	5,	.209
5.5,	3.1,	7.412,	5,	.207

"END OF FILE"