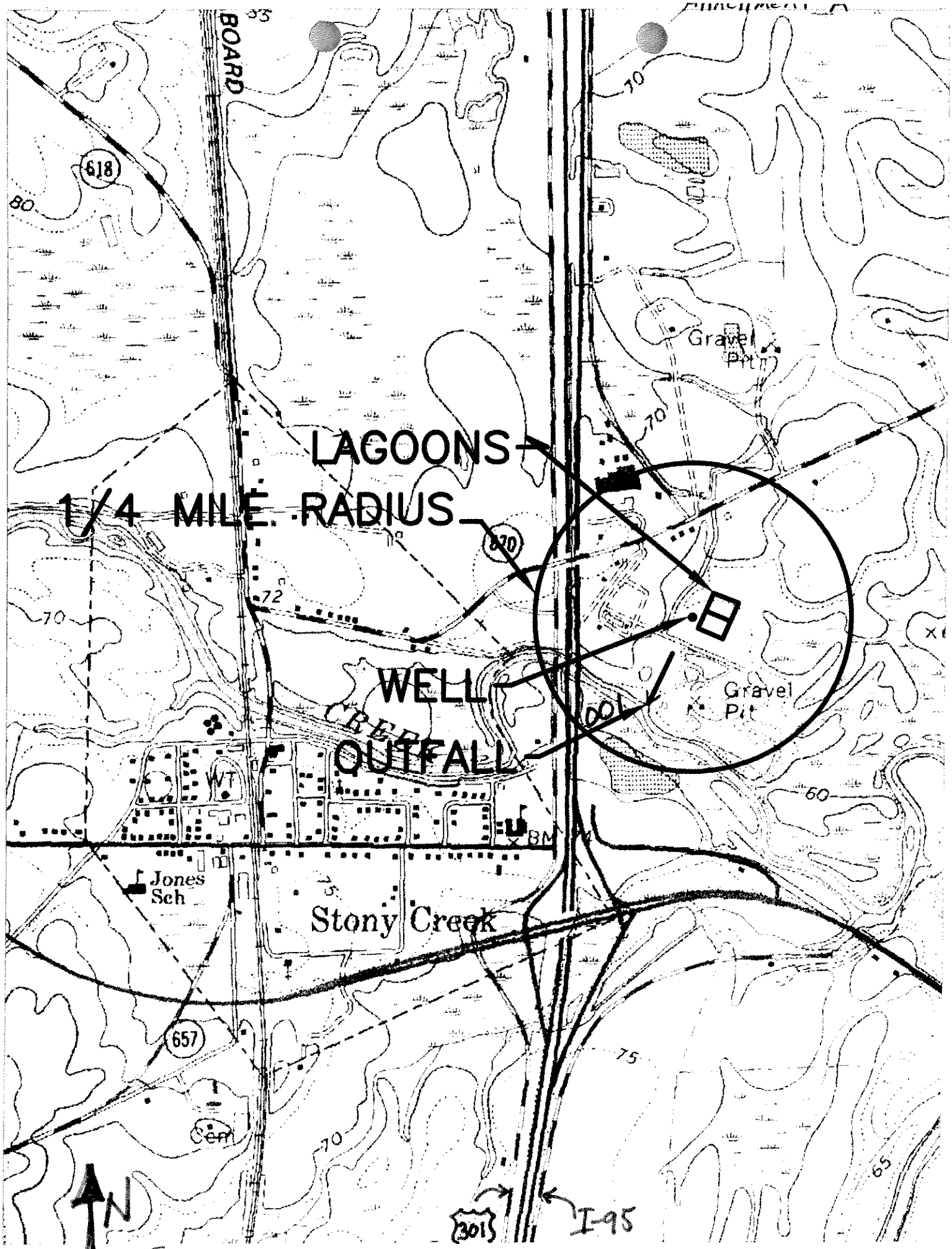
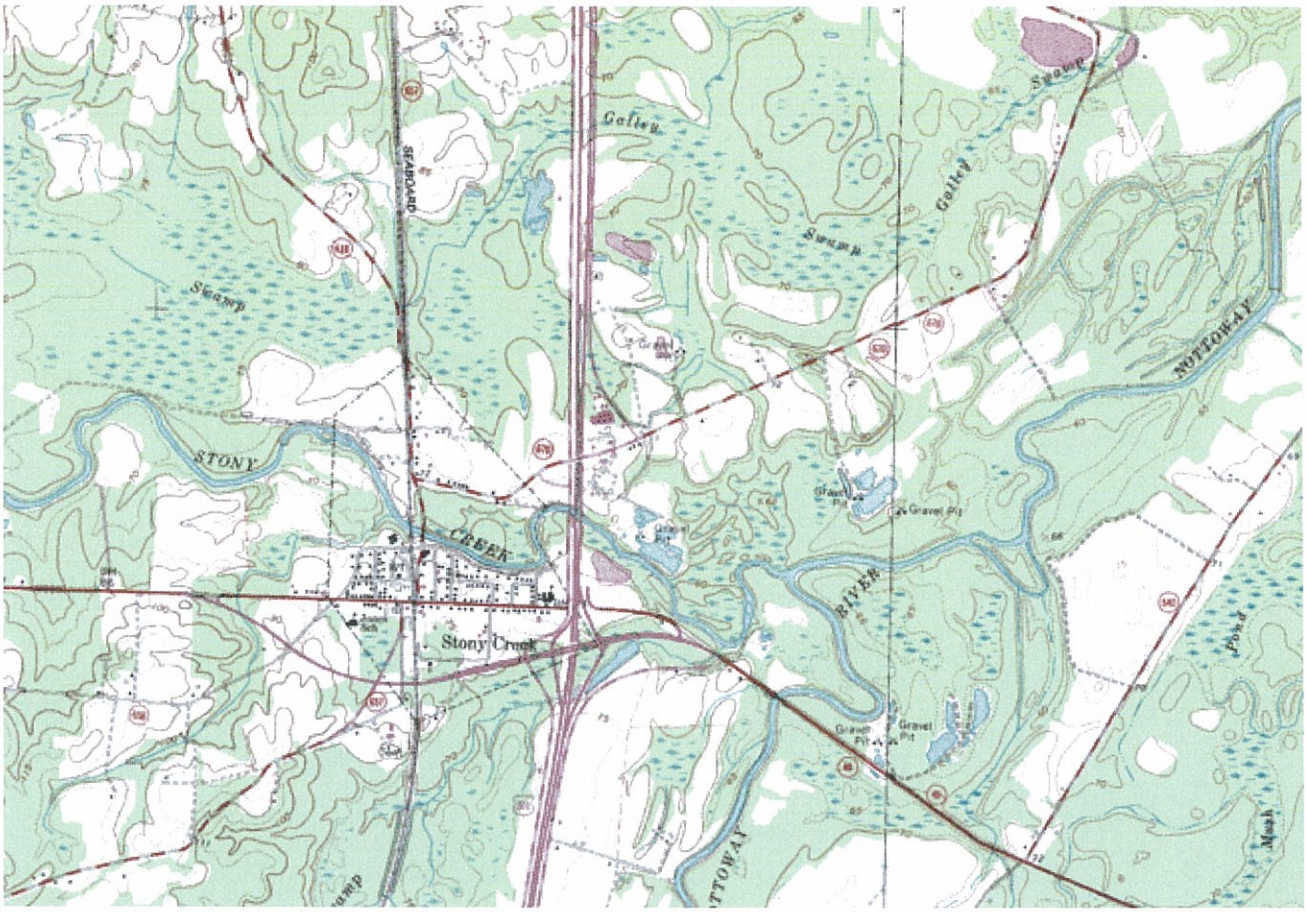
Attachment A – Topographic Map



Stony Creek Discharge #39B


Galley
Swamp
Galley
Swamp
SEABOARD
Swamp
NOTTOWAY
STONY
CREEK
RIVER
Stony Creek
Gravel Pit
Gravel Pit
Gravel Pit
Gravel Pit
Pond
Marsh
TTOWAY

Attachment B – Flow Diagram

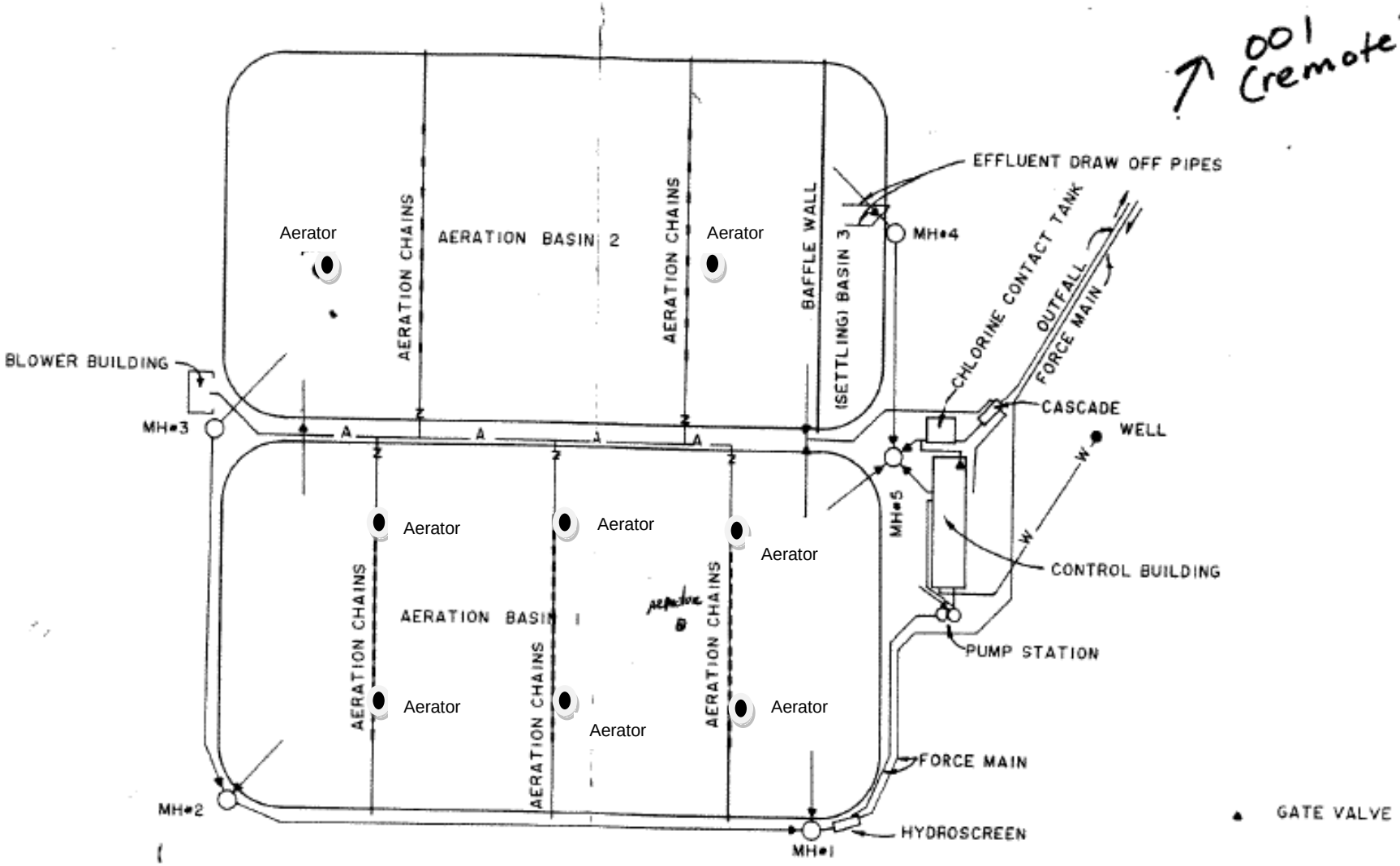


FIGURE 1
SEWAGE TREATMENT PLANT LAYOUT

B & B Consultants, Inc.

Attachment C – Ambient Stream Data, Flow Frequency Memorandum, 303(d) Fact Sheets, 1989 Stream Sanitation Analysis and 2004 Stream Sanitation Analysis

MEMORANDUM

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

SUBJECT: Flow Frequency Determination / 303(d) Status
Stony Creek WWTF – VA0062669

TO: Adam Eller

FROM: Jennifer Palmore, P.G.

DATE: November 12, 2015

COPIES: File

The Sussex Service Authority's Stony Creek Wastewater Treatment Facility discharges to Stony Creek at rivermile 5ASTO001.10. Stream flow frequencies are required for use by the permit writer in developing effluent limitations for the VPDES permit.

The DEQ conducted several stream flow measurements on Stony Creek above the Stony Creek STP (#02046250) from 1994 to 1998. The measurements were correlated with the same day daily mean values from the continuous record gage on Stony Creek near Dinwiddie, VA (#02046000). The measurements and daily mean values were plotted on a logarithmic graph and a power trend line was extrapolated through the data points. The required flow frequencies at the measurement site were derived from the equation for the trend line. The regression analysis is attached. Due to the proximity of the measurement site and discharge point, the values are considered to be equal. The data for the reference gage and the measurement site/discharge point are presented below.

Stony Creek near Dinwiddie (#02046000)
Period of record: 1946-2003
High Flow Months: Jan-Apr
Drainage Area: 112 mi^2

1Q30 = 0.12 cfs	High Flow 1Q10 = 14 cfs
1Q10 = 0.26 cfs	High Flow 7Q10 = 18 cfs
7Q10 = 0.31 cfs	High Flow 30Q10 = 32 cfs
30Q10 = 0.77 cfs	HM = undefined
30Q5 = 1.6 cfs	

Stony Creek above Stony Creek STP (#02046250)
Drainage area: 237 mi^2

1Q30 = 0.16 cfs (0.10 MGD)	High Flow 1Q10 = 23 cfs (15 MGD)
1Q10 = 0.36 cfs (0.23 MGD)	High Flow 7Q10 = 30 cfs (19 MGD)
7Q10 = 0.43 cfs (0.28 MGD)	High Flow 30Q10 = 55 cfs (35 MGD)
30Q10 = 1.1 cfs (0.72 MGD)	HM = undefined
30Q5 = 2.4 cfs (1.5 MGD)	

The analysis does not address any withdrawals, discharges, or springs lying between the measurement site and the outfall.

Stony Creek has been considered a Tier 1 water. Antidegradation was not applied during the 2004 modeling effort.

Water quality data from monitoring station 5ASTO001.20 is attached. The station is located on Stony Creek at the Route 301 South bridge, which is approximately 0.1 mile upstream of the discharge.

During the 2012 305(b)/303(d) Water Quality Integrated Report, Stony Creek was assessed as a Category 5A waterbody ("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 stream is impaired of the Fish Consumption Use due to mercury exceedances in fish tissue; the applicable fact sheet is attached. The Aquatic Life- and Recreation Uses are fully supporting and the Wildlife Use was not assessed.

In the draft 2014 305(b)/303(d) Water Quality Assessment, Stony Creek remains a Category 5A waterbody; the draft fact sheet is attached. The stream is impaired of the Fish Consumption Use due to mercury exceedances in fish tissue. The Aquatic Life- , Recreation-, and Wildlife Uses are fully supporting.

The facility is not addressed in any currently-approved TMDL.

If you have any questions, or need any additional information, please let me know.

Station ID	Collection Date	Depth Desc	Depth	Temp Celcius	Field Ph	Do Probe	Do Winkler	Fdt Do Optical	Salinity	Specific Conductance
5ASTO001.20	9/13/1990	S	0.3	22.8	6.62		6.4			82
5ASTO001.20	12/5/1990	S	0.3	8.1	7.53	9.95	10			
5ASTO001.20	12/5/1990	B	0.3	8.1	7.53	9.95				
5ASTO001.20	3/28/1991	S	0.09			8.46				
5ASTO001.20	3/28/1991	B	0.3	17.05	6.56	8.46				
5ASTO001.20	6/19/1991	S	0.3	23.96	6.4		5.04			
5ASTO001.20	9/19/1991	S	0.3	25.58	6.04	5.19				
5ASTO001.20	12/19/1991	S	0.3	2.94	6.64	12.45				
5ASTO001.20	3/18/1992	S	0.3	9.02	5.33	10.68				
5ASTO001.20	6/22/1992	S	0.3	18.97	6	7.09				
5ASTO001.20	9/21/1992	S	0.3	21.38	6.33	6.12				
5ASTO001.20	12/8/1992	S	0.3	4.57	6.6	11.03				
5ASTO001.20	3/16/1993	S	0.3	3.16	5.76	12.18				
5ASTO001.20	6/9/1993	S	0.3	22.55	6.18	7.09				
5ASTO001.20	9/23/1993	S	0.3	22.42	6.67	6.99				
5ASTO001.20	12/15/1993	S	0.3	4.43	6.17	12.28				
5ASTO001.20	3/14/1994	S	0.3	9.31	6	10.82				
5ASTO001.20	6/13/1994	S	0.3	23.13	6.7	7.79				
5ASTO001.20	7/12/1994	S	0.3	26.36	6.98	7.22				
5ASTO001.20	9/15/1994	S	0.3	20.67	6.49	7				124
5ASTO001.20	10/6/1994	S	0.3	16.73	6.82	9.39				
5ASTO001.20	1/23/1995	S	0.3	4.96	6.68	11.77				
5ASTO001.20	4/11/1995	S	0.3	13.94	6.66	8.57				83
5ASTO001.20	7/5/1995	S	0.3	23.01	5.91	6.7				60
5ASTO001.20	10/2/1995	S	0.3	17.89	6.44	6.11				73
5ASTO001.20	1/4/1996	S	0.3	4.01	6.35	12.31				71
5ASTO001.20	4/9/1996	S	0.3	10.01	6.18	10.09				76
5ASTO001.20	7/16/1996	S	0.3	24.21	6.09	6.77				71
5ASTO001.20	10/28/1996	S	0.3	15.26	6.19	7.83				59
5ASTO001.20	1/29/1997	S	0.3	4.83	6.03	11.95				57
5ASTO001.20	4/24/1997	S	0.3	10.4	6.66	9.84				65
5ASTO001.20	9/18/1997	S	0.3	22.44	6.92	8.23				89
5ASTO001.20	9/18/1997	B	0.3	22.08	6.74	6.61				94
5ASTO001.20	11/13/1997	S	0.3	9.28	6.43	10.04				109
5ASTO001.20	1/13/1998	S	0.3	8.01	6.21	10.84				72
5ASTO001.20	3/9/1998	S	0.3	13.58	5.74	8.58				60
5ASTO001.20	5/21/1998	S	0.3	20.69	6.63	7.75				67
5ASTO001.20	7/23/1998	S	0.3	27.5	6.64	5.18				92
5ASTO001.20	9/29/1998	S	0.3	22.41	6.57	7.15				138
5ASTO001.20	11/30/1998	S	0.3	9.54	6.49	9.68				111
5ASTO001.20	1/20/1999	S	0.3	6.25	5.92	11.17				103
5ASTO001.20	3/29/1999	S	0.3	11.67	6.09	10.24				78
5ASTO001.20	5/24/1999	S	0.3	21.14	6.59	7.2				69
5ASTO001.20	7/13/1999	S	0.3	21.02	6.62	6.87				87
5ASTO001.20	9/2/1999	S	0.3	20.79	6.35	6.9			0	80
5ASTO001.20	11/8/1999	S	0.3	9.57	5.56	8.5			0	65
5ASTO001.20	1/12/2000	S	0.3	8.62	6.17	10.7			0	70
5ASTO001.20	3/20/2000	S	0.3	10.65	6.2	10.75			0	68
5ASTO001.20	5/15/2000	S	0.3	21.51	6.46	7.95				78
5ASTO001.20	7/24/2000	S	0.3	21.94	5.64	6.75			0	78
5ASTO001.20	9/7/2000	S	0.3	19.49	5.84	7.42			0	54
5ASTO001.20	11/15/2000	S	0.3	9.24	7.05	10.45			0	91
5ASTO001.20	1/9/2001	S	0.3	1.07	6.13	12.6			0	61.4

Station ID	Collection Date	Depth Desc	Depth	Temp Celcius	Field Ph	Do Probe	Do Winkler	Fdt Do Optical	Salinity	Specific Conductance
5ASTO001.20	3/8/2001	S	0.3	5.68	6.48	11.67				
5ASTO001.20	6/20/2001	S	0.3	22.07	6.51	7.57	6.74		0	67
5ASTO001.20	8/27/2001	S	0.3	24.41	6.8	8.96			0	79
5ASTO001.20	10/9/2001	S	0.3	13.07	6.45	11.16			0	138
5ASTO001.20	12/20/2001	S	0.3	8.1	6.39	10.78			0	102
5ASTO001.20	2/25/2002	S	0.3	7.14	6.71	11.02				91
5ASTO001.20	4/18/2002	S	0.3	22.83	6.64	5.43			0	85
5ASTO001.20	7/2/2002	S	0.3	25.01	6.47	6.59				117
5ASTO001.20	7/30/2002	S	0.3	28.18	6.71	4.68			0	84
5ASTO001.20	9/5/2002	S	0.3	23.65	6.63	4.83			0	101
5ASTO001.20	11/25/2002	S	0.3	7.38	6.04	11.05			0	85
5ASTO001.20	1/30/2003	S	0.3	1.48	6.62	13.65			0	71
5ASTO001.20	3/27/2003	S	0.3	14.48	6.24	9.27			0	50
5ASTO001.20	5/22/2003	S	0.3	16.17	5.74	8.72			0	40.2
5ASTO001.20	7/14/2003	S	0.3	25.05	6.83	6.35			0	57
5ASTO001.20	9/29/2003	S	0.3	19.71	6.4	6.59			0	48.3
5ASTO001.20	12/1/2003	S	0.3	8.37	6.87	10.73			0	64
5ASTO001.20	1/29/2004	S	0.3	0.26	6.88	15.21			0	66
5ASTO001.20	3/16/2004	S	0.3	11.37	6.11	9.93			0	98
5ASTO001.20	5/25/2004	S	0.3	24.53	6.59	6.45			0	73
5ASTO001.20	8/24/2004	S	0.3	22.53	6.49	7.26			0	53
5ASTO001.20	10/13/2004	S	0.3	14.07	6.67	10.37			0	62
5ASTO001.20	12/8/2004	S	0.3	10.2	6.64	10.12			0	62
5ASTO001.20	2/14/2005	S	0.3	6.37	7.27	12.33			0	58.4
5ASTO001.20	4/25/2005	S	0.3	13.28	6.9	9.42			0	62
5ASTO001.20	6/13/2005	S	0.3	26.61	6.83	7.02			0	71.8
5ASTO001.20	8/25/2005	S	0.3	24.39	7.02	6.83				111
5ASTO001.20	10/20/2005	S	0.3	18.64	7.54	9.16			0	97.1
5ASTO001.20	12/12/2005	S	0.3	4.21	7.21	12.65			0	75.3
5ASTO001.20	2/16/2006	S	0.3	7.09	6.83	12.79				70
5ASTO001.20	4/19/2006	S	0.3	17.4	6.8	9.5			0	72.4
5ASTO001.20	6/27/2006	S	0.3	26.3	7	8.9			0	83.5
5ASTO001.20	8/16/2006	S	0.3	26.5	7.1	7.1			0	96.7
5ASTO001.20	10/11/2006	S	0.3	16.4	6	7			0	46
5ASTO001.20	12/19/2006	S	0.3	7.9	6.8	11.4				51
5ASTO001.20	1/16/2007	S	0.3	11.7	6.6	10.1				48
5ASTO001.20	3/8/2007	S	0.3	6.3	6.8	12			0	55
5ASTO001.20	5/16/2007	S	0.3	19	7.1	7.9			0	68
5ASTO001.20	7/12/2007	S	0.3	26.2	7.1			4.8	0	86
5ASTO001.20	9/13/2007	S	0.3	23.9	7.1	8.6			0	81
5ASTO001.20	11/19/2007	S	0.3	8.4	7.2	9.8			0	97
5ASTO001.20	1/14/2008	S	0.3	6.9	7.3	11.3				83
5ASTO001.20	3/3/2008	S	0.3	7	7	11.6			0	73
5ASTO001.20	5/13/2008	S	0.3	13.5	6.2	7.7			0	42
5ASTO001.20	7/8/2008	S	0.3	25.2	7	5.4			0	79
5ASTO001.20	9/24/2008	S	0.3	18.6	7.1	7.3			0	68
5ASTO001.20	11/17/2008	S	0.3	11.4	6.1	7.3			0	52
5ASTO001.20	2/4/2009	S	0.3	3.7	6.8	12.8				54
5ASTO001.20	4/7/2009	S	0.3	14.1	7	8.8			0	56
5ASTO001.20	6/3/2009	S	0.3	23.5	6.9	6.2			0	69
5ASTO001.20	8/4/2009	S	0.3	26.4	7	4.9			0	78
5ASTO001.20	10/6/2009	S	0.3	17.1	7	7.5			0	74
5ASTO001.20	12/2/2009	S	0.3	7.9	6.8	10.6			0	54

Station ID	Collection Date	Depth Desc	Depth	Temp Celcius	Field Ph	Do Probe	Do Winkler	Fdt Do Optical	Salinity	Specific Conductance
5ASTO001.20	1/5/2010	S	0.3	0.2	7.1	13.5			0	51
5ASTO001.20	3/2/2010	S	0.3	5.5	7.2	11.9			0	53
5ASTO001.20	5/12/2010	S	0.3	15.3	7.2	8.5			0	74
5ASTO001.20	7/12/2010	S	0.3	25.5	6.8	5.2			0	112
5ASTO001.20	9/15/2010	S	0.3	21.4	6.8	6			0	128
5ASTO001.20	11/8/2010	S	0.3	8	6.8	10.9			0	89
5ASTO001.20	2/7/2011	S	0.3	4.5	7.1	13.2			0	72
5ASTO001.20	4/6/2011	S	0.3	12.1	6.7	8.6			0	66
5ASTO001.20	6/8/2011	S	0.3	25.2	7.1	7.8				81
5ASTO001.20	8/15/2011	S	0.3	23.9	7.1	5.4			0	54
5ASTO001.20	10/5/2011	S	0.3	15.4	6.6	7.5			0	69
5ASTO001.20	12/5/2011	S	0.3	7.47	6.68	10.75			0	59
5ASTO001.20	1/4/2012	S	0.3	2.76	6.89	12.53			0	60
5ASTO001.20	3/14/2012	S	0.3	14.1	7.1	9.14			0	57
5ASTO001.20	5/8/2012	S	0.3	19.55	6.98	7.71				77
5ASTO001.20	7/17/2012	S	0.3	27.86	6.59	5.15				103
5ASTO001.20	9/27/2012	S	0.3	19.08	6.85	7.57				70
5ASTO001.20	11/27/2012	S	0.3	6.16	7.08	11.26				87
5ASTO001.20	2/28/2013	S	0.3	7.43	6.8	10.47				48
5ASTO001.20	4/17/2013	S	0.3	18.27	6.68	7.38				68
5ASTO001.20	6/25/2013	S	0.3	24.01	6.45	6.45				69
5ASTO001.20	8/21/2013	S	0.3	22.18	6.34	6.84				78
5ASTO001.20	10/21/2013	S	0.3	14.46	6.4			8.59		80
5ASTO001.20	12/9/2013	S	0.3	6.73	6.91	10.45				61
5ASTO001.20	1/14/2014	S	0.3	6.38	6.48	10.67				41
5ASTO001.20	3/10/2014	S	0.3	6.79	6.78	11.2				59
5ASTO001.20	5/5/2014	S	0.3	17.69	6.91	8.24				60
5ASTO001.20	7/7/2014	S	0.3	24.25	6.73	5.87				98
5ASTO001.20	9/9/2014	S	0.3	22	6.47			6.27		65
5ASTO001.20	11/5/2014	S	0.3	10.76	6.74	8.65				81
5ASTO001.20	2/5/2015	S	0.3	4.22	6.19	12.01				59
5ASTO001.20	4/7/2015	S	0.3	15.87	6.8	8.7				64
5ASTO001.20	6/15/2015	S	0.3	25.81	6.87	6.01				70
5ASTO001.20	8/26/2015	S	0.3	24.33	7			5.64		79
5ASTO001.20	10/6/2015	S	0.3	16.07	6.24	8.17				55
90th Percentile				**25.1**	**7.1**					
10th Percentile				**4.8**	**6.0**					

					00900	
					HARDNESS, TOTAL (MG/L AS CACO3)	
Sta Id	**Collection Date Time**	**Depth Des**	**Depth**	**Container**	**Value**	**Com Code**
5ASTO001.20	09/13/1990 10:25	S	0.3	R	46	
5ASTO001.20	12/05/1990 09:35	S	0.3	R	32	
5ASTO001.20	03/28/1991 10:00	B	0.3	R	16	
5ASTO001.20	06/19/1991 10:35	S	0.3	R	43	
5ASTO001.20	09/19/1991 10:20	S	0.3	R	58	
5ASTO001.20	12/19/1991 09:30	S	0.3	R	22	
5ASTO001.20	03/18/1992 09:35	S	0.3	R	25	
5ASTO001.20	06/22/1992 09:50	S	0.3	R	31	
5ASTO001.20	09/21/1992 09:41	S	0.3	R	31	
5ASTO001.20	12/08/1992 09:40	S	0.3	R	26	
5ASTO001.20	03/16/1993 10:20	S	0.3	R	22	
5ASTO001.20	06/09/1993 10:10	S	0.3	R	19	
5ASTO001.20	09/23/1993 12:00	S	0.3	R	44	
5ASTO001.20	12/15/1993 10:00	S	0.3	R	38	
5ASTO001.20	03/14/1994 10:55	S	0.3	R	14	
5ASTO001.20	06/13/1994 10:55	S	0.3	R	25	
5ASTO001.20	07/12/1994 11:22	S	0.3	R	32	
5ASTO001.20	10/06/1994 14:24	S	0.3	R	24	
5ASTO001.20	01/23/1995 10:44	S	0.3	R	19	
5ASTO001.20	04/11/1995 10:10	S	0.3	R	20	
5ASTO001.20	07/05/1995 12:23	S	0.3	R	16	
5ASTO001.20	10/02/1995 09:30	S	0.3	R	26	
5ASTO001.20	01/04/1996 09:30	S	0.3	R	18	
5ASTO001.20	04/09/1996 12:00	S	0.3	R	16	
5ASTO001.20	07/16/1996 10:45	S	0.3	R	22	
5ASTO001.20	10/28/1996 08:28	S	0.3	R	20	
5ASTO001.20	01/29/1997 10:15	S	0.3	R	16.4	
5ASTO001.20	04/24/1997 09:30	S	0.3	R	23.4	
5ASTO001.20	07/16/1997 10:45	S	0.3	R	32.7	
5ASTO001.20	09/18/1997 12:45	S	0.3	R	25.7	
5ASTO001.20	11/13/1997 12:00	S	0.3	R	22	
5ASTO001.20	01/13/1998 11:30	S	0.3	R	15.6	
5ASTO001.20	03/09/1998 11:30	S	0.3	R	14	
5ASTO001.20	05/21/1998 11:30	S	0.3	R	12.8	
5ASTO001.20	07/23/1998 08:30	S	0.3	R	34.1	
5ASTO001.20	09/29/1998 09:22	S	0.3	R	29.4	
5ASTO001.20	11/30/1998 11:00	S	0.3	R	24	
5ASTO001.20	01/20/1999 10:45	S	0.3	R	24	
5ASTO001.20	03/29/1999 12:00	S	0.3	R	26	
5ASTO001.20	05/24/1999 12:00	S	0.3	R	36	
5ASTO001.20	07/13/1999 10:08	S	0.3	R	26.4	
5ASTO001.20	09/02/1999 12:00	S	0.3	R	19.3	
5ASTO001.20	11/08/1999 10:30	S	0.3	R	11.9	
5ASTO001.20	01/12/2000 12:00	S	0.3	R	20.1	
5ASTO001.20	03/20/2000 11:45	S	0.3	R	15	
5ASTO001.20	05/15/2000 13:20	S	0.3	R	23	
5ASTO001.20	07/24/2000 11:40	S	0.3	R	17	
5ASTO001.20	09/07/2000 11:15	S	0.3	R	16.1	
5ASTO001.20	11/15/2000 11:05	S	0.3	R	33.6	
5ASTO001.20	01/09/2001 09:40	S	0.3	R	15.8	
5ASTO001.20	03/08/2001 09:40	S	0.3	R	10	

					00900	
					HARDNESS, TOTAL (MG/L AS CACO3)	
Sta Id	**Collection Date Time**	**Depth Des**	**Depth**	**Container**	**Value**	**Com Code**
5ASTO001.20	06/20/2001 10:30	S	0.3	R	8.5	
5ASTO001.20	08/27/2001 12:00	S	0.3	R	14.2	
5ASTO001.20	10/09/2001 12:00	S	0.3	R	35.7	
5ASTO001.20	12/20/2001 10:40	S	0.3	R	15.5	
5ASTO001.20	02/25/2002 11:30	S	0.3	R	14	
5ASTO001.20	04/18/2002 10:00	S	0.3	R	23.6	
5ASTO001.20	07/02/2002 11:25	S	0.3	R	30.1	
5ASTO001.20	07/30/2002 10:15	S	0.3	R	30.7	
5ASTO001.20	09/05/2002 11:00	S	0.3	R	25.9	
5ASTO001.20	11/25/2002 10:30	S	0.3	R	107	
5ASTO001.20	01/30/2003 11:30	S	0.3	R	23.1	
5ASTO001.20	03/27/2003 11:30	S	0.3	R	15.2	
5ASTO001.20	07/14/2003 13:45	S	0.3	R	14.1	
5ASTO001.20	09/29/2003 11:45	S	0.3	R	14.5	
5ASTO001.20	12/01/2003 11:00	S	0.3	R	22	
5ASTO001.20	01/29/2004 11:37	S	0.3	R	19	
5ASTO001.20	03/16/2004 10:20	S	0.3	R	16.6	
5ASTO001.20	05/25/2004 10:05	S	0.3	R	28	
5ASTO001.20	08/24/2004 11:30	S	0.3	R	10	U
5ASTO001.20	10/13/2004 12:00	S	0.3	R	50	
5ASTO001.20	12/08/2004 11:00	S	0.3	R	20	
5ASTO001.20	02/14/2005 09:35	S	0.3	R	18	
5ASTO001.20	04/25/2005 10:25	S	0.3	R	22.9	
5ASTO001.20	06/13/2005 15:30	S	0.3	R	22	
5ASTO001.20	08/25/2005 10:40	S	0.3	R	28	
5ASTO001.20	10/20/2005 14:25	S	0.3	R	30	
5ASTO001.20	12/12/2005 13:40	S	0.3	R	21	
5ASTO001.20	02/16/2006 15:45	S	0.3	R	10	U
5ASTO001.20	04/19/2006 14:35	S	0.3	R	26	
5ASTO001.20	06/27/2006 13:20	S	0.3	R	26	
5ASTO001.20	08/16/2006 11:45	S	0.3	R	26	
5ASTO001.20	10/11/2006 14:20	S	0.3	R	12	
5ASTO001.20	12/19/2006 13:30	S	0.3	R	14	
5ASTO001.20	01/16/2007 10:30	S	0.3	R	16	
5ASTO001.20	02/05/2015 08:25	S	0.3	R	25	
5ASTO001.20	04/07/2015 10:15	S	0.3	R	23	
5ASTO001.20	06/15/2015 10:30	S	0.3	R	25	
5ASTO001.20	08/26/2015 10:15	S	0.3	R	27	
5ASTO001.20	10/06/2015 10:03	S	0.3	R	27	
Average					**24**	

2012 Fact Sheets for 303(d) Waters

RIVER BASIN: Chowan River and Dismal Swamp Basins **HYDROLOGIC UNIT:** 03010201

STREAM NAME: **Stony Creek**

TMDL ID: **K21R-03-HG** **2012 IMPAIRED AREA ID:** VAP-K21R-03

ASSESSMENT CATEGORY: 5A **TMDL DUE DATE:** 2022

IMPAIRED SIZE: 8.45 - Miles **Watershed:** VAP-K21R

INITIAL LISTING: 2010

UPSTREAM LIMIT: Mortar Branch

DOWNSTREAM LIMIT: Mouth

Stony Creek from Mortar Branch downstream to its mouth.

CLEAN WATER ACT GOAL AND USE SUPPORT:

Fish Consumption Use - Not Supporting

IMPAIRMENT: Mercury

During the 2010 cycle, Stony Creek from Mortar Branch to its mouth was assessed as not supporting of the Fish Consumption Use due to mercury exceedances in flier sunfish and spotted bass during DEQ's 2007 fish tissue sampling.

IMPAIRMENT SOURCE: Unknown, Atmospheric Deposition

The source is considered unknown, however atmospheric deposition is suspected..

RECOMMENDATION: Problem Characterization

2014 Fact Sheets for 303(d) Waters

RIVER BASIN: Chowan River and Dismal Swamp Basins **HYDROLOGIC UNIT:** 03010201

STREAM NAME: **Stony Creek**

TMDL ID: **K21R-03-HG** **2014 IMPAIRED AREA ID:** VAP-K21R-03

ASSESSMENT CATEGORY: 5A **TMDL DUE DATE:** 2022

IMPAIRED SIZE: 8.35 - Miles **Watershed:** VAP-K21R

INITIAL LISTING: 2010

UPSTREAM LIMIT: Mortar Branch

DOWNSTREAM LIMIT: Mouth

Stony Creek from Mortar Branch downstream to its mouth.

CLEAN WATER ACT GOAL AND USE SUPPORT:

Fish Consumption Use - Not Supporting

IMPAIRMENT: Mercury

During the 2010 cycle, Stony Creek from Mortar Branch to its mouth was assessed as not supporting of the Fish Consumption Use due to mercury exceedances in flier sunfish and spotted bass during DEQ's 2007 fish tissue sampling.

IMPAIRMENT SOURCE Unknown, Atmospheric Deposition

The source is considered unknown, however atmospheric deposition is suspected..

RECOMMENDATION: Problem Characterization

VIRGINIA WATER CONTROL BOARD

PIEDMONT REGIONAL OFFICE

MEMORANDUM

SUBJECT: Stony Creek, Sussex County, Discharge into Stony Creek, Chowan River Basin

TO: Tom Modena JDM 5-10-89

FROM: D.X. Ren

DATE: May 3, 1989

COPIES: Bob Ehrhart, File

On April 24, 1989 Stony Creek STP submitted a permit application which resulted in a stream analysis for a discharge flow of 0.04 MGD.

In reviewing the file of Stony Creek STP, it indicated the model was done on March 3, 1977 using the Monroe program. The modeling results are listed as follows:

$Q = 0.10$ MGD

$BOD_5 = 30.0$ mg/l

$BOD_u/BOD_5 = 1.58$

$DO = 5.5$ mg/l

(no TKN limit included)

Because the current flow (0.04 MGD) is much less than the modeled flow (0.1 MGD) there is no reason to remodel this discharge.

Please keep the current effluent limits except the new proposed flow.

I reran this model using the PC version verifying this.

If you have any questions, please let me know.

MEMORANDUM

DEPARTMENT OF ENVIRONMENTAL QUALITY
Piedmont Regional Office

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

SUBJECT: Stream Sanitation Analysis – Stony Creek
Stony Creek STP discharge (VA0062669)

TO: Diane Cook

FROM: Jennifer Palmore

DATE: April 29, 2004

COPIES: Mark Alling, Model File

A request for a stream sanitation analysis for the Stony Creek sewage treatment plant (STP) discharge was received on March 23, 2004. The request was submitted because the permittee has applied for an increase in design flow from the current 0.04 MGD to 0.06 MGD.

Background

The STP discharges into Stony Creek near Stony Creek, VA in Sussex County. Stony Creek is on the 2002 Total Maximum Daily Load (TMDL) Priority List (303(d) List) as impaired of the Aquatic Life use support goal due to pH violations and of the Recreation Use due to fecal coliform violations. The violations occurred at the Route 301 Southbound bridge (5ASTO001.20). The TMDLs are both due in 2014. Due to the impairment of the Aquatic Life Use, Stony Creek is determined to be a Tier 1 water.

The current limits were recommended in 1989 by D. X. Ren (memo attached). In his memo, he indicates that the discharge was initially modeled on March 3, 1977 using the Monroe program at a design flow of 0.10 MGD. Ren reviewed the model and determined that since the 1989 flow was less than the modeled flow, no remodeling was necessary at that time.

Current Modeling Effort

Review of the 1989 and 1977 model files indicates that the model used a 7Q10 flow in Stony Creek that is substantially higher than indicated in the current flow frequency (see attached). Therefore, that modeling effort was deemed to be inadequate for this expansion.

A site visit was performed on April 22, 2004. The stream was modeled using DEQ's Regional Model version 4.1. Based on the model, the following effluent limits are recommended to maintain water quality standards in Stony Creek:

Q = 0.06 MGD
$cBOD_5$ = 15 mg/L
TKN = 8 mg/L
DO = 5 mg/L

The modeling documentation is attached. If you have any questions or need any additional information, please do not hesitate to contact me.

VIRGINIA WATER CONTROL BOARD

PIEDMONT REGIONAL OFFICE

MEMORANDUM

SUBJECT: Stony Creek, Sussex County, Discharge into Stony Creek, Chowan River Basin

TO: Tom Modena JDM 5-10-89

FROM: D.X. Ren

DATE: May 3, 1989

COPIES: Bob Ehrhart, File

On April 24, 1989 Stony Creek STP submitted a permit application which resulted in a stream analysis for a discharge flow of 0.04 MGD.

In reviewing the file of Stony Creek STP, it indicated the model was done on March 3, 1977 using the Monroe program. The modeling results are listed as follows:

$Q = 0.10$ MGD

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$DO = 5.5$ mg/l

(no TKN limit included)

Because the current flow (0.04 MGD) is much less than the modeled flow (0.1 MGD) there is no reason to remodel this discharge.

Please keep the current effluent limits except the new proposed flow.

I reran this model using the PC version verifying this.

If you have any questions, please let me know.

REGIONAL MODELING SYSTEM VERSION 4.0

Model Input File for the Discharge to STONY CREEK.

File Information

File Name:	E:\models\Stony Creek STP segment 1.mod
Date Modified:	April 27, 2004

Water Quality Standards Information

Stream Name:	STONY CREEK
River Basin:	Chowan River Basin
Section:	2b
Class:	III - Nontidal Waters (Coastal and Piedmont)
Special Standards:	None

Background Flow Information

Gauge Used:	02046250 Stony Creek at Stony Creek STP
Gauge Drainage Area:	236 Sq.Mi.
Gauge 7Q10 Flow:	0.36 MGD
Headwater Drainage Area:	236 Sq.Mi.
Headwater 7Q10 Flow:	0.36 MGD (Net; includes Withdrawals/Discharges)
Withdrawal/Discharges:	0 MGD
Incremental Flow in Segments:	1.525424E-03 MGD/Sq.Mi.

Background Water Quality

Background Temperature:	24.2 Degrees C
Background cBOD5:	2 mg/l
Background TKN:	0 mg/l
Background D.O.:	7.585876 mg/l

Model Segmentation

Number of Segments:	1
Model Start Elevation:	57 ft above MSL
Model End Elevation:	54 ft above MSL

MEMORANDUM

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

SUBJECT: Flow Frequency Determination
Stony Creek STP – VA0062669

TO: Diane Cook

FROM: Jennifer Palmore

DATE: April 7, 2004
Revised April 15, 2004

COPIES: File

A flow frequency request was received for Stony Creek at the discharge of the Stony Creek STP in Sussex County Virginia. Stream flow frequencies are required at these sites for use by the permit writer in developing effluent limitations for the VPDES permit.

The DEQ conducted several stream flow measurements on Stony Creek above the Stony Creek STP from 1994 to 1998. The measurements were correlated with the same day daily mean values from the continuous record gage on Stony Creek near Dinwiddie, VA (#02046000). The measurements and daily mean values were plotted on a logarithmic graph and a power trend line was extrapolated through the data points. The required flow frequencies at the STP were derived from the trend line equation. The data for the reference gage and the measurement site/discharge point are presented below.

Stony Creek near Dinwiddie (#02046000)
Period of record 1946-2001
Drainage Area = 112 mi^2

1Q10 = 0.30 cfs	High Flow 1Q10 = 16 cfs
7Q10 = 0.40 cfs	High Flow 7Q10 = 19 cfs
30Q10 = 0.81 cfs	High Flow 30Q10 = 34 cfs
30Q5 = 1.7 cfs	HM = 7.3 cfs

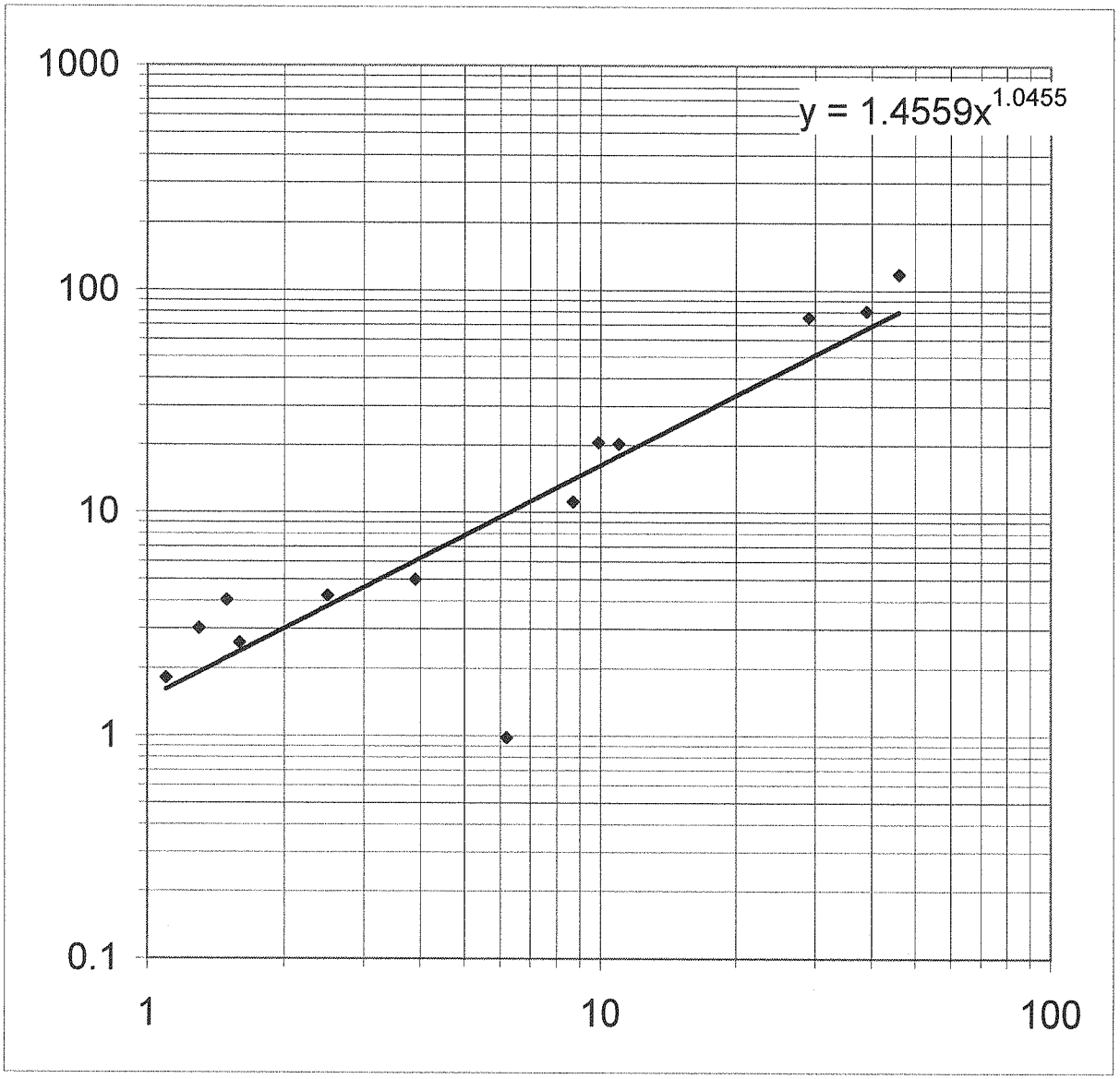
Stony Creek above Stony Creek STP (#02046250)
Drainage area = 236 mi^2

1Q10 = 0.41 cfs (0.26 MGD)	High Flow 1Q10 = 26 cfs (17 MGD)
7Q10 = 0.56 cfs (0.36 MGD)	High Flow 7Q10 = 32 cfs (21 MGD)
30Q10 = 1.2 cfs (0.77 MGD)	High Flow 30Q10 = 58 cfs (37 MGD)
30Q5 = 2.5 cfs (1.6 MGD)	HM = 12 cfs (7.8 MGD)

The high flow months are January through April. The values at the discharge point were determined by drainage area proportions and do not address any withdrawals, discharges, or springs lying between the gage and the outfall.

If you have any questions, please let me know.

Stony Creek above Stony Creek STP, at Stony Creek, VA #02046250
vs Stony Creek near Dinwiddie, VA #02046000



Flow Data (cfs)

Date	Gage	at STP
6/9/94	9.9	20.5
7/11/94	8.7	11.1
9/19/94	6.2	0.98
4/19/95	29	75.2
8/15/95	3.9	4.98
9/13/95	1.5	4.03
4/29/96	46	118
5/29/97	39	80.3
6/26/97	11	20.2
9/3/97	1.3	3.01
10/10/97	1.1	1.81
8/10/98	2.5	4.22
9/23/98	1.6	2.6

Flow Frequencies (cfs)

Gage		at STP
0.30	1Q10	0.41
0.40	7Q10	0.56
0.81	30Q10	1.2
1.7	30Q5	2.5
16	HF 1Q10	26
19	HF 7Q10	32
34	HF 30Q10	58
7.3	HM	12
	ANN AVG	
112	DA (mi^2)	236
	Jan-Apr	

Regression Statistics	
Multiple R	0.986338
R Square	0.972862
Adjusted R Square	0.970395
Standard Error	6.626587
Observations	13

REGIONAL MODELING SYSTEM VERSION 4.0

Model Input File for the Discharge to STONY CREEK.

Segment Information for Segment 1

Definition Information

Segment Definition:	A discharge enters.
Discharge Name:	STONY CREEK STP
VPDES Permit No.:	VA0062669

Discharger Flow Information

Flow:	0.06 MGD
cBOD5:	15 mg/l
TKN:	8 mg/l
D.O.:	5 mg/l
Temperature:	28 Degrees C

Geographic Information

Segment Length:	1.02 miles
Upstream Drainage Area:	236 Sq.Mi.
Downstream Drainage Area:	~~0 Sq.Mi.~~ 245 mi²
Upstream Elevation:	57 Ft.
Downstream Elevation:	54 Ft.

Hydraulic Information

Segment Width:	8 Ft.
Segment Depth:	0.3 Ft.
Segment Velocity:	0.2 Ft./Sec.
Segment Flow:	0.42 MGD
Incremental Flow:	-0.36 MGD (Applied at end of segment.)

Channel Information

Cross Section:	Rectangular
Character:	Moderately Meandering
Pool and Riffle:	No
Bottom Type:	Gravel
Sludge:	None
Plants:	Few
Algae:	None

"Model Run For E:\models\Stony Creek STP segment 1.mod On 4/28/04 3:26
:36 PM"

"Model is for STONY CREEK."
"Model starts at the STONY CREEK STP discharge."

"Background Data"

"7Q10",	"cBOD5",	"TKN",	"DO",	"Temp"
"(mgd)",	"(mg/l)",	"(mg/l)",	"(mg/l)",	"deg C"
.36,	2,	0,	7.586,	24.2

"Discharge/Tributary Input Data for Segment 1"

"Flow",	"cBOD5",	"TKN",	"DO",	"Temp"
"(mgd)",	"(mg/l)",	"(mg/l)",	"(mg/l)",	"deg C"
.06,	15,	8,	,5,	28

"Hydraulic Information for Segment 1"

"Length",	"Width",	"Depth",	"Velocity"
"(mi)",	"(ft)",	"(ft)",	"(ft/sec)"
1.02,	8,	.3,	.2

"Initial Mix Values for Segment 1"

"Flow",	"DO",	"cBOD",	"nBOD",	"DOSat",	"Temp"
"(mgd)",	"(mg/l)",	"(mg/l)",	"(mg/l)",	"(mg/l)",	"deg C"
.42,	7.216,	9.643,	3.093,	8.354,	24.74286

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

"k1",	"k1@T",	"k2",	"k2@T",	"kn",	"kn@T",	"BD",	"BD@T"
1,	1.243,	1.765,	1.975,	.4,	.576,	0,	0

"Output for Segment 1"
"Segment starts at STONY CREEK STP"

"Total",	"Segm."			
"Dist.",	"Dist.",	"DO",	"cBOD",	"nBOD"
"(mi)",	"(mi)",	"(mg/l)",	"(mg/l)",	"(mg/l)"
0,	0,	7.216,	9.643,	3.093
.1,	.1,	6.881,	9.284,	3.039
.2,	.2,	6.58,	8.938,	2.986
.3,	.3,	6.31,	8.605,	2.934
.4,	.4,	6.069,	8.284,	2.883
.5,	.5,	5.854,	7.975,	2.833
.6,	.6,	5.664,	7.678,	2.784
.7,	.7,	5.497,	7.392,	2.735
.8,	.8,	5.351,	7.116,	2.687
.9,	.9,	5.224,	6.851,	2.64
1,	1,	5.115,	6.596,	2.594
1.02,	1.02,	5.095,	6.546,	2.585

TKN = 3.597 mg/L

$cBOD_5$ = 2.618 mg/L

"END OF FILE"

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:	STONY CREEK (WITH STP)
VPDES Permit No.:	

Discharger Flow Information

Flow:	0.43 MGD
cBOD5:	2.618 mg/l
TKN:	3.597 mg/l
D.O.:	5.095 mg/l
Temperature:	24.2 Degrees C

Geographic Information

Segment Length:	3.2 miles
Upstream Drainage Area:	586 Sq.Mi.
Downstream Drainage Area:	0 Sq.Mi.
Upstream Elevation:	54 Ft.
Downstream Elevation:	50 Ft.

Hydraulic Information

Segment Width:	50 Ft.
Segment Depth:	4.944 Ft.
Segment Velocity:	0.535 Ft./Sec.
Segment Flow:	85.446 MGD
Incremental Flow:	-131.572 MGD (Applied at end of segment.)

Channel Information

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

REGIONAL MODELING SYSTEM VERSION 4.0

Model Input File for the Discharge to NOTTOWAY RIVER.

File Information

File Name:	E:\models\Stony Creek STP segment 2.mod
Date Modified:	April 28, 2004

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:	02045500 Nottoway River at Route 301
Gauge Drainage Area:	579 Sq.Mi.
Gauge 7Q10 Flow:	84 MGD
Headwater Drainage Area:	586 Sq.Mi.
Headwater 7Q10 Flow:	85.01554 MGD (Net; includes Withdrawals/Discharges)
Withdrawal/Discharges:	0 MGD
Incremental Flow in Segments:	0.1450777 MGD/Sq.Mi.

Background Water Quality

Background Temperature:	26 Degrees C
Background cBOD5:	2 mg/l
Background TKN:	0 mg/l
Background D.O.:	7.368245 mg/l

Model Segmentation

Number of Segments:	1
Model Start Elevation:	54 ft above MSL
Model End Elevation:	50 ft above MSL

```
"Model Run For E:\models\Stony Creek STP segment 2.mod On 4/28/04 4:28
:54 PM"

"Model is for NOTTOWAY RIVER."
"Model starts at the STONY CREEK (WITH STP) discharge."

"Background Data"
"7Q10",  "cBOD5",  "TKN",     "DO",      "Temp"
"(mgd)", "(mg/l)", "(mg/l)", "(mg/l)", "deg C"
85.0155, 2,        0,         7.368,     26

"Discharge/Tributary Input Data for Segment 1"
"Flow",  "cBOD5",  "TKN",     "DO",      "Temp"
"(mgd)", "(mg/l)", "(mg/l)", "(mg/l)", "deg C"
.43,     2.618,    3.597,     ,5.095,    24.2

"Hydraulic Information for Segment 1"
"Length","Width",  "Depth",   "Velocity"
"(mi)",  "(ft)",   "(ft)",    "(ft/sec)"
3.2,     50,       4.944,     .535

"Initial Mix Values for Segment 1"
"Flow",  "DO",     "cBOD",    "nBOD",    "DOSat",   "Temp"
"(mgd)", "(mg/l)", "(mg/l)", "(mg/l)", "(mg/l)", "deg C"
85.4455, 7.357,    5.008,     .013,      8.189,     25.99094

"Rate Constants for Segment 1. - (All units Per Day)"
"k1",  "k1@T", "k2",   "k2@T", "kn",   "kn@T", "BD",   "BD@T"
.5,    .658,   .75,    .865,   .25,    .396,   0,      0

"Output for Segment 1"
"Segment starts at STONY CREEK (WITH STP)"
"Total", "Segm."
"Dist.", "Dist.",  "DO",      "cBOD",    "nBOD"
"(mi)",  "(mi)",   "(mg/l)", "(mg/l)", "(mg/l)"
0,       0,        7.357,     5.008,     .013
.1,      .1,       7.328,     5,         .013
.2,      .2,       7.336,     5,         .013
.3,      .3,       7.344,     5,         .013
.4,      .4,       7.352,     5,         .013
.5,      .5,       7.36,      5,         .013
.6,      .6,       7.368,     5,         .013
.7,      .7,       7.37,      5,         .013
.8,      .8,       7.37,      5,         .013
.9,      .9,       7.37,      5,         .013
1,       1,        7.37,      5,         .013
1.1,     1.1,      7.37,      5,         .013
1.2,     1.2,      7.37,      5,         .013
```

1.3,	1.3,	7.37,	5,	.013
1.4,	1.4,	7.37,	5,	.013
1.5,	1.5,	7.37,	5,	.013
1.6,	1.6,	7.37,	5,	.013
1.7,	1.7,	7.37,	5,	.013
1.8,	1.8,	7.37,	5,	.013
1.9,	1.9,	7.37,	5,	.013
2,	2,	7.37,	5,	.013
2.1,	2.1,	7.37,	5,	.013
2.2,	2.2,	7.37,	5,	.013
2.3,	2.3,	7.37,	5,	.013
2.4,	2.4,	7.37,	5,	.013
2.5,	2.5,	7.37,	5,	.013
2.6,	2.6,	7.37,	5,	.013
2.7,	2.7,	7.37,	5,	.013
2.8,	2.8,	7.37,	5,	.013
2.9,	2.9,	7.37,	5,	.013
3,	3,	7.37,	5,	.013
3.1,	3.1,	7.37,	5,	.013
3.2,	3.2,	7.37,	5,	.013

"END OF FILE"

Attachment D - Effluent Data (Provided on Monthly DMRs, the 2015 Reissuance Application and the 2012 Attachment A Water Quality Criteria Monitoring Form)

Facility Name:Stony Creek WWTP

Permit No:VA0062669

Discharge Monitoring Report (DMR) Data

Outfall Number	Parameter Code	Parameter Description	Quant Avg	Quanti Max	Conc Avg	Conc Min	Conc Max	Received Date
001	001	FLOW	0.0343	.0694	NULL	NULL	NULL	11-Jul-11
		(MGD)	0.0554	.1035	NULL	NULL	NULL	9-Aug-11
			0.0436	0.0776	NULL	NULL	NULL	13-Sep-11
			0.0540	0.0657	NULL	NULL	NULL	5-Oct-11
			0.0347	0.0569	NULL	NULL	NULL	2-Nov-11
			0.0409	0.0712	NULL	NULL	NULL	6-Dec-11
			0.0332	0.0464	NULL	NULL	NULL	4-Jan-12
			0.0314	0.0530	NULL	NULL	NULL	7-Feb-12
			0.0231	0.0335	NULL	NULL	NULL	8-Mar-12
			0.0288	0.0377	NULL	NULL	NULL	9-Apr-12
			0.0356	0.0595	NULL	NULL	NULL	4-May-12
			0.0322	0.0493	NULL	NULL	NULL	5-Jun-12
			0.0338	0.0518	NULL	NULL	NULL	3-Jul-12
			0.0382	0.0639	NULL	NULL	NULL	6-Aug-12
			0.0436	0.0577	NULL	NULL	NULL	6-Sep-12
			0.0332	0.0463	NULL	NULL	NULL	4-Oct-12
			0.0427	0.0910	NULL	NULL	NULL	6-Nov-12
			0.0321	0.0386	NULL	NULL	NULL	4-Dec-12
			0.0393	0.0725	NULL	NULL	NULL	9-Jan-13
			0.0464	0.0996	NULL	NULL	NULL	7-Feb-13
			0.0418	0.0748	NULL	NULL	NULL	8-Mar-13
			0.0496	0.0809	NULL	NULL	NULL	4-Apr-13
			0.0485	0.0624	NULL	NULL	NULL	3-May-13
			0.0410	0.0629	NULL	NULL	NULL	7-Jun-13
			0.0518	0.0811	NULL	NULL	NULL	5-Jul-13
			0.0621	0.0803	NULL	NULL	NULL	7-Aug-13
			0.0492	0.0741	NULL	NULL	NULL	6-Sep-13
			0.0311	0.0426	NULL	NULL	NULL	7-Oct-13
			0.0346	0.0514	NULL	NULL	NULL	4-Nov-13
			0.0311	0.0410	NULL	NULL	NULL	3-Dec-13
			0.0405	0.0579	NULL	NULL	NULL	7-Jan-14
			0.0428	0.0572	NULL	NULL	NULL	5-Feb-14
			0.0383	0.0498	NULL	NULL	NULL	4-Mar-14
			0.0352	0.0767	NULL	NULL	NULL	7-Apr-14
			0.0465	0.0761	NULL	NULL	NULL	6-May-14
			0.0354	0.0647	NULL	NULL	NULL	4-Jun-14
			0.0354	0.0754	NULL	NULL	NULL	8-Jul-14
			0.0375	0.0651	NULL	NULL	NULL	3-Jul-14
			0.0442	0.0657	NULL	NULL	NULL	3-Sep-14
			0.0365	0.0646	NULL	NULL	NULL	3-Oct-14
			0.0340	0.0530	NULL	NULL	NULL	3-Nov-14
			0.0306	0.0473	NULL	NULL	NULL	4-Dec-14
			0.0312	0.0443	NULL	NULL	NULL	6-Jan-15
			0.0358	0.0492	NULL	NULL	NULL	6-Feb-15
			0.0354	0.0412	NULL	NULL	NULL	2-Mar-15
			0.0470	0.0937	NULL	NULL	NULL	7-Apr-15
			0.0362	0.0490	NULL	NULL	NULL	5-May-15

			0.0321	0.0395	NULL	NULL	NULL	5-Jun-15
			0.0536	0.1342	NULL	NULL	NULL	7-Jul-15
			0.0423	0.1219	NULL	NULL	NULL	5-Aug-15
			0.0395	0.0766	NULL	NULL	NULL	3-Sep-15
			0.0387	0.0763	NULL	NULL	NULL	5-Oct-15
			0.0439	0.1000	NULL	NULL	NULL	4-Nov-15
	002	pH	NULL	NULL	NULL	7.59	7.91	11-Jul-11
		(s.u.)	NULL	NULL	NULL	7.58	8.04	9-Aug-11
			NULL	NULL	NULL	7.3	7.9	13-Sep-11
			NULL	NULL	NULL	7.33	7.72	5-Oct-11
			NULL	NULL	NULL	7.36	7.71	2-Nov-11
			NULL	NULL	NULL	7.43	7.72	6-Dec-11
			NULL	NULL	NULL	7.56	7.81	4-Jan-12
			NULL	NULL	NULL	7.77	8.01	7-Feb-12
			NULL	NULL	NULL	7.72	7.98	8-Mar-12
			NULL	NULL	NULL	7.39	7.73	9-Apr-12
			NULL	NULL	NULL	7.28	7.68	4-May-12
			NULL	NULL	NULL	7.17	7.66	5-Jun-12
			NULL	NULL	NULL	7.49	7.73	3-Jul-12
			NULL	NULL	NULL	7.57	7.74	6-Aug-12
			NULL	NULL	NULL	7.34	7.79	6-Sep-12
			NULL	NULL	NULL	7.41	7.72	4-Oct-12
			NULL	NULL	NULL	7.46	7.74	6-Nov-12
			NULL	NULL	NULL	7.6	8.02	4-Dec-12
			NULL	NULL	NULL	7.18	8.1	9-Jan-13
			NULL	NULL	NULL	7.9	8.16	7-Feb-13
			NULL	NULL	NULL	7.87	8.05	8-Mar-13
			NULL	NULL	NULL	7.89	8.09	4-Apr-13
			NULL	NULL	NULL	6.94	7.95	3-May-13
			NULL	NULL	NULL	7.07	7.61	7-Jun-13
			NULL	NULL	NULL	7.07	7.61	5-Jul-13
			NULL	NULL	NULL	7.19	7.64	7-Aug-13
			NULL	NULL	NULL	7.51	7.77	6-Sep-13
			NULL	NULL	NULL	7.65	7.81	7-Oct-13
			NULL	NULL	NULL	7.38	7.71	4-Nov-13
			NULL	NULL	NULL	7	7.54	3-Dec-13
			NULL	NULL	NULL	7.45	7.85	7-Jan-14
			NULL	NULL	NULL	7.72	8.03	5-Feb-14
			NULL	NULL	NULL	7.81	8.01	4-Mar-14
			NULL	NULL	NULL	7.81	8.15	7-Apr-14
			NULL	NULL	NULL	7.63	8.08	6-May-14
			NULL	NULL	NULL	6.97	8.08	4-Jun-14
			NULL	NULL	NULL	7.89	8.19	8-Jul-14
			NULL	NULL	NULL	7.87	8.09	3-Jul-14
			NULL	NULL	NULL	7.44	8.1	3-Sep-14
			NULL	NULL	NULL	7.63	7.87	3-Oct-14
			NULL	NULL	NULL	7.74	7.93	3-Nov-14
			NULL	NULL	NULL	7.79	8.03	4-Dec-14
			NULL	NULL	NULL	7.91	8.15	6-Jan-15
			NULL	NULL	NULL	7.97	8.28	6-Feb-15
			NULL	NULL	NULL	8.15	8.33	2-Mar-15
			NULL	NULL	NULL	7.98	8.21	7-Apr-15
			NULL	NULL	NULL	7.99	8.15	5-May-15
			NULL	NULL	NULL	7.98	8.18	5-Jun-15
			NULL	NULL	NULL	7.69	8.01	7-Jul-15

			NULL	NULL	NULL	7.67	7.95	5-Aug-15
			NULL	NULL	NULL	7.78	7.96	3-Sep-15
			NULL	NULL	NULL	7.79	8.1	5-Oct-15
			NULL	NULL	NULL	7.74	7.94	4-Nov-15
					90th% =	7.91	**8.16**	
					10th% =	7.17	**7.69**	
	003	BOD5	2040	2040	29.00	NULL	29.00	11-Jul-11
	Quant =	*g/day*	2589.99	2589.99	22.00	NULL	22.00	9-Aug-11
	Conc =	*mg/L*	1450.33	1450.33	12.00	NULL	12.00	13-Sep-11
			1288.25	1288.25	10.00	NULL	10.00	5-Oct-11
			1434.39	1434.39	14.00	NULL	14.00	2-Nov-11
			2046.61	2046.1	16.00	NULL	16.00	6-Dec-11
			1354.12	1354.12	10.00	NULL	10.00	4-Jan-12
			4009.84	4009.84	20.00	NULL	20.00	7-Feb-12
			1075.36	2060.93	20.67	NULL	44.00	8-Mar-12
			2883.25	2883.25	27.00	NULL	27.00	9-Apr-12
			3255.17	3255.17	21.00	NULL	21.00	4-May-12
			640.95	640.95	6.00	NULL	6.00	5-Jun-12
			1478.14	1478.14	15.00	NULL	15.00	3-Jul-12
			982.91	982.91	8.00	NULL	8.00	6-Aug-12
			<QL	<QL	<QL	NULL	<QL	6-Sep-12
			720.72	720.72	5.00	NULL	5.00	4-Oct-12
			1913.39	1913.39	13.00	NULL	13.00	6-Nov-12
			1321.89	1321.89	11.00	NULL	11.00	4-Dec-12
			2079.80	2079.80	16.00	NULL	16.00	9-Jan-13
			1110.24	1110.24	11.00	NULL	11.00	7-Feb-13
			2242.87	2242.87	14.00	NULL	14.00	8-Mar-13
			2343.67	2343.67	14.00	NULL	14.00	4-Apr-13
			3115.60	3115.60	19.00	NULL	19.00	3-May-13
			3553.94	5261.47	27.67	NULL	43.00	7-Jun-13
			3012.91	3012.91	25.00	NULL	25.00	5-Jul-13
			1105.38	1215.92	11.00	NULL	11.00	7-Aug-13
			1490.44	1490.44	11.00	NULL	11.00	6-Sep-13
			1160.65	1160.65	10.00	NULL	10.00	7-Oct-13
			2371.93	2371.93	18.00	NULL	18.00	4-Nov-13
			1309.94	1309.94	10.00	NULL	10.00	3-Dec-13
			693.56	693.56	5.00	NULL	5.00	7-Jan-14
			1925.10	1925.10	17	NULL	17	5-Feb-14
			2278.88	2278.88	19.00	NULL	19.00	4-Mar-14
			1119.62	1119.62	10.00	NULL	10.00	7-Apr-14
			2604.97	2604.97	19.00	NULL	19.00	6-May-14
			2720.98	2720.98	22.00	NULL	22.00	4-Jun-14
			790.21	790.21	6	NULL	6	8-Jul-14
			1556.69	1556.69	11.00	NULL	11.00	3-Jul-14
			737.36	737.36	7.00	NULL	7.00	3-Sep-14
			1393.01	1393.01	12	NULL	12	3-Oct-14
			930.18	930.18	7.00	NULL	7.00	3-Nov-14
			869.86	869.86	8.00	NULL	8.00	4-Dec-14
			908.31	908.31	9.00	NULL	9.00	6-Jan-15
			879.07	879.07	8.00	NULL	8.00	6-Feb-15
			3452.69	3452.69	26.00	NULL	26.00	2-Mar-15
			1713.15	1713.15	21.00	NULL	21.00	7-Apr-15
			4148.17	4148.17	28.00	NULL	28.00	5-May-15
			3565.59	4789.10	27.00	NULL	36.00	5-Jun-15
			4566.34	6690.71	26	NULL	32	7-Jul-15

			1671.68	1671.68	12	NULL	12	5-Aug-15
			3225.59	3399.06	28.50	NULL	31.00	3-Sep-15
			555.06	555.06	7.00	NULL	7.00	5-Oct-15
			1499.63	1499.63	14.00	NULL	14.00	4-Nov-15
	004	TSS	850	850	12.00	NULL	12.00	11-Jul-11
	Quant =	*g/day*	2236.81	2236.81	19.00	NULL	19.00	9-Aug-11
	Conc =	*mg/L*	1208.61	1208.61	10.00	NULL	10.00	13-Sep-11
			1417.08	1417.08	11.0	NULL	11.0	5-Oct-11
			850.39	850.39	8.30	NULL	8.30	2-Nov-11
			741.89	741.89	5.80	NULL	5.80	6-Dec-11
			1354.12	1354.12	10.00	NULL	10.00	4-Jan-12
			3608.86	3608.86	18.00	NULL	18.00	7-Feb-12
			983.63	983.63	21.00	NULL	21.00	8-Mar-12
			1922.17	1922.17	18.00	NULL	18.00	9-Apr-12
			1860.10	1860.10	12.00	NULL	12.00	4-May-12
			1068.25	1068.25	10.00	NULL	10.00	5-Jun-12
			965.72	965.72	9.80	NULL	9.80	3-Jul-12
			737.18	737.18	6.00	NULL	6.00	6-Aug-12
			515.81	515.81	5.90	NULL	5.90	6-Sep-12
			1138.74	1138.74	7.90	NULL	7.90	4-Oct-12
			1913.39	1913.39	13.00	NULL	13.00	6-Nov-12
			1802.58	1802.58	15.00	NULL	15.00	4-Dec-12
			2079.80	2079.80	16.00	NULL	16.00	9-Jan-13
			2220.49	2220.49	22.00	NULL	22.00	7-Feb-13
			2883.69	2883.69	18.00	NULL	18.00	8-Mar-13
			1841.45	1841.45	11.00	NULL	11.00	4-Apr-13
			2623.67	2623.67	16.00	NULL	16.00	3-May-13
			1835.40	1835.40	15.00	NULL	15.00	7-Jun-13
			3012.91	3012.91	15.00	NULL	15.00	5-Jul-13
			1105.38	1105.38	10.00	NULL	10.00	7-Aug-13
			1625.94	1625.94	12.00	NULL	12.00	6-Sep-13
			1149.04	1149.04	9.90	NULL	9.90	7-Oct-13
			948.77	948.77	7.20	NULL	7.20	4-Nov-13
			1244.44	1244.44	9.50	NULL	9.50	3-Dec-13
			693.56	693.56	5.00	NULL	5.00	7-Jan-14
			1925.10	1925.10	13	NULL	13	5-Feb-14
			1679.17	1679.17	14.00	NULL	14.00	4-Mar-14
			1791.39	1791.39	16.00	NULL	16.00	7-Apr-14
			1645.24	1645.24	12.00	NULL	12.00	6-May-14
			3524.62	4452.51	29.00	NULL	29.00	4-Jun-14
			1843.83	1843.83	14	NULL	14	8-Jul-14
			1174.59	1174.59	8.30	NULL	8.30	3-Jul-14
			1685.40	1685.40	7.00	NULL	7.00	3-Sep-14
			859.02	859.02	7.40	NULL	7.40	3-Oct-14
			823.87	823.87	6.20	NULL	6.20	3-Nov-14
			1196.06	1196.06	11.00	NULL	11.00	4-Dec-14
			1009.24	1009.24	10	NULL	10	6-Jan-15
			1758.14	1758.14	8.00	NULL	8.00	6-Feb-15
			2257.53	2257.53	17	NULL	17	2-Mar-15
			1713.15	1713.15	12.00	NULL	12.00	7-Apr-15
			2074.09	2074.09	14.00	NULL	14.00	5-May-15
			2793.64	2793.64	21.00	NULL	21.00	5-Jun-15
			3320.22	4808.95	19	NULL	23	7-Jul-15
			3020.53	4597.12	23.50	NULL	33.00	5-Aug-15
			2756.76	2756.76	28.00	NULL	28.00	3-Sep-15

			475.77	475.77	6	NULL	6	5-Oct-15
			631.99	631.99	5.90	NULL	5.90	4-Nov-15
	005	CL2, TOTAL	NULL	NULL	<QL	NULL	<QL	11-Jul-11
	Conc =	*mg/L*	NULL	NULL	<QL	NULL	<QL	9-Aug-11
			NULL	NULL	<QL	NULL	<QL	13-Sep-11
			NULL	NULL	<QL	NULL	<QL	5-Oct-11
			NULL	NULL	<QL	NULL	<QL	2-Nov-11
			NULL	NULL	<QL	NULL	<QL	6-Dec-11
			NULL	NULL	<QL	NULL	<QL	4-Jan-12
			NULL	NULL	<QL	NULL	<QL	7-Feb-12
			NULL	NULL	<QL	NULL	<QL	8-Mar-12
			NULL	NULL	<QL	NULL	<QL	9-Apr-12
			NULL	NULL	<QL	NULL	<QL	4-May-12
			NULL	NULL	<QL	NULL	<QL	5-Jun-12
			NULL	NULL	<QL	NULL	<QL	3-Jul-12
			NULL	NULL	<QL	NULL	<QL	6-Aug-12
			NULL	NULL	<QL	NULL	<QL	6-Sep-12
			NULL	NULL	<QL	NULL	<QL	4-Oct-12
			NULL	NULL	<QL	NULL	<QL	6-Nov-12
			NULL	NULL	<QL	NULL	<QL	4-Dec-12
			NULL	NULL	<QL	NULL	<QL	9-Jan-13
			NULL	NULL	<QL	NULL	<QL	7-Feb-13
			NULL	NULL	<QL	NULL	<QL	8-Mar-13
			NULL	NULL	<QL	NULL	<QL	4-Apr-13
			NULL	NULL	<QL	NULL	<QL	3-May-13
			NULL	NULL	<QL	NULL	<QL	7-Jun-13
			NULL	NULL	<QL	NULL	<QL	5-Jul-13
			NULL	NULL	<QL	NULL	<QL	7-Aug-13
			NULL	NULL	<QL	NULL	<QL	6-Sep-13
			NULL	NULL	<QL	NULL	<QL	7-Oct-13
			NULL	NULL	<QL	NULL	<QL	4-Nov-13
			NULL	NULL	<QL	NULL	<QL	3-Dec-13
			NULL	NULL	<QL	NULL	<QL	7-Jan-14
			NULL	NULL	<QL	NULL	<QL	5-Feb-14
			NULL	NULL	<QL	NULL	<QL	4-Mar-14
			NULL	NULL	<QL	NULL	<QL	7-Apr-14
			NULL	NULL	<QL	NULL	<QL	6-May-14
			NULL	NULL	<QL	NULL	<QL	4-Jun-14
			NULL	NULL	<QL	NULL	<QL	8-Jul-14
			NULL	NULL	<QL	NULL	<QL	3-Jul-14
			NULL	NULL	<QL	NULL	<QL	3-Sep-14
			NULL	NULL	<QL	NULL	<QL	3-Oct-14
			NULL	NULL	<QL	NULL	<QL	3-Nov-14
			NULL	NULL	<QL	NULL	<QL	4-Dec-14
			NULL	NULL	<QL	NULL	<QL	6-Jan-15
			NULL	NULL	<QL	NULL	<QL	6-Feb-15
			NULL	NULL	<QL	NULL	<QL	2-Mar-15
			NULL	NULL	<QL	NULL	<QL	7-Apr-15
			NULL	NULL	<QL	NULL	<QL	5-May-15
			NULL	NULL	<QL	NULL	<QL	5-Jun-15
			NULL	NULL	<QL	NULL	<QL	7-Jul-15
			NULL	NULL	<QL	NULL	<QL	5-Aug-15
			NULL	NULL	<QL	NULL	<QL	3-Sep-15
			NULL	NULL	<QL	NULL	<QL	5-Oct-15
			NULL	NULL	<QL	NULL	<QL	4-Nov-15

	007	DO	NULL	NULL	NULL	6.21	NULL	11-Jul-11
	Conc =	*mg/L*	NULL	NULL	NULL	6.13	NULL	9-Aug-11
			NULL	NULL	NULL	3.23	NULL	13-Sep-11
			NULL	NULL	NULL	6.90	NULL	5-Oct-11
			NULL	NULL	NULL	7.72	NULL	2-Nov-11
			NULL	NULL	NULL	9.00	NULL	6-Dec-11
			NULL	NULL	NULL	9.75	NULL	4-Jan-12
			NULL	NULL	NULL	10.59	NULL	7-Feb-12
			NULL	NULL	NULL	10.19	NULL	8-Mar-12
			NULL	NULL	NULL	8.38	NULL	9-Apr-12
			NULL	NULL	NULL	8.02	NULL	4-May-12
			NULL	NULL	NULL	7.31	NULL	5-Jun-12
			NULL	NULL	NULL	6.76	NULL	3-Jul-12
			NULL	NULL	NULL	6.32	NULL	6-Aug-12
			NULL	NULL	NULL	6.45	NULL	6-Sep-12
			NULL	NULL	NULL	6.72	NULL	4-Oct-12
			NULL	NULL	NULL	7.69	NULL	6-Nov-12
			NULL	NULL	NULL	9.33	NULL	4-Dec-12
			NULL	NULL	NULL	10.03	NULL	9-Jan-13
			NULL	NULL	NULL	8.00	NULL	7-Feb-13
			NULL	NULL	NULL	11.43	NULL	8-Mar-13
			NULL	NULL	NULL	10.66	NULL	4-Apr-13
			NULL	NULL	NULL	8.04	NULL	3-May-13
			NULL	NULL	NULL	6.95	NULL	7-Jun-13
			NULL	NULL	NULL	6.38	NULL	5-Jul-13
			NULL	NULL	NULL	6.30	NULL	7-Aug-13
			NULL	NULL	NULL	6.75	NULL	6-Sep-13
			NULL	NULL	NULL	6.71	NULL	7-Oct-13
			NULL	NULL	NULL	7.39	NULL	4-Nov-13
			NULL	NULL	NULL	7.28	NULL	3-Dec-13
			NULL	NULL	NULL	9.52	NULL	7-Jan-14
			NULL	NULL	NULL	10.38	NULL	5-Feb-14
			NULL	NULL	NULL	9.58	NULL	4-Mar-14
			NULL	NULL	NULL	8.80	NULL	7-Apr-14
			NULL	NULL	NULL	7.47	NULL	6-May-14
			NULL	NULL	NULL	6.35	NULL	4-Jun-14
			NULL	NULL	NULL	5.88	NULL	8-Jul-14
			NULL	NULL	NULL	6.03	NULL	3-Jul-14
			NULL	NULL	NULL	6.18	NULL	3-Sep-14
			NULL	NULL	NULL	6.62	NULL	3-Oct-14
			NULL	NULL	NULL	7.58	NULL	3-Nov-14
			NULL	NULL	NULL	9.28	NULL	4-Dec-14
			NULL	NULL	NULL	8.73	NULL	6-Jan-15
			NULL	NULL	NULL	8.30	NULL	6-Feb-15
			NULL	NULL	NULL	9.25	NULL	2-Mar-15
			NULL	NULL	NULL	7.36	NULL	7-Apr-15
			NULL	NULL	NULL	7.02	NULL	5-May-15
			NULL	NULL	NULL	6.29	NULL	5-Jun-15
			NULL	NULL	NULL	5.31	NULL	7-Jul-15
			NULL	NULL	NULL	6.11	NULL	5-Aug-15
			NULL	NULL	NULL	6.01	NULL	3-Sep-15
			NULL	NULL	NULL	6.23	NULL	5-Oct-15
			NULL	NULL	NULL	7.46	NULL	4-Nov-15
	120	E.COLI	NULL	NULL	<QL	NULL	NULL	11-Jul-11

		(N/cmL)	NULL	NULL	<QL	NULL	NULL	9-Aug-11
			NULL	NULL	3	NULL	NULL	13-Sep-11
			NULL	NULL	1.4	NULL	NULL	5-Oct-11
			NULL	NULL	1.2	NULL	NULL	2-Nov-11
			NULL	NULL	1.0	NULL	NULL	6-Dec-11
			NULL	NULL	4.6	NULL	NULL	4-Jan-12
			NULL	NULL	14.3	NULL	NULL	7-Feb-12
			NULL	NULL	3.5	NULL	NULL	8-Mar-12
			NULL	NULL	3.9	NULL	NULL	9-Apr-12
			NULL	NULL	1.9	NULL	NULL	4-May-12
			NULL	NULL	7.2	NULL	NULL	5-Jun-12
			NULL	NULL	82.3	NULL	NULL	3-Jul-12
			NULL	NULL	3.1	NULL	NULL	6-Aug-12
			NULL	NULL	1.6	NULL	NULL	6-Sep-12
			NULL	NULL	6.4	NULL	NULL	4-Oct-12
			NULL	NULL	2.0	NULL	NULL	6-Nov-12
			NULL	NULL	1.0	NULL	NULL	4-Dec-12
			NULL	NULL	1.0	NULL	NULL	9-Jan-13
			NULL	NULL	2.5	NULL	NULL	7-Feb-13
			NULL	NULL	1.0	NULL	NULL	8-Mar-13
			NULL	NULL	5.0	NULL	NULL	4-Apr-13
			NULL	NULL	3.0	NULL	NULL	3-May-13
			NULL	NULL	3.7	NULL	NULL	7-Jun-13
			NULL	NULL	1.3	NULL	NULL	5-Jul-13
			NULL	NULL	3.0	NULL	NULL	7-Aug-13
			NULL	NULL	1.0	NULL	NULL	6-Sep-13
			NULL	NULL	1.0	NULL	NULL	7-Oct-13
			NULL	NULL	1.6	NULL	NULL	4-Nov-13
			NULL	NULL	14	NULL	NULL	3-Dec-13
			NULL	NULL	72.3	NULL	NULL	7-Jan-14
			NULL	NULL	3.3	NULL	NULL	5-Feb-14
			NULL	NULL	1.4	NULL	NULL	4-Mar-14
			NULL	NULL	1.0	NULL	NULL	7-Apr-14
			NULL	NULL	1.0	NULL	NULL	6-May-14
			NULL	NULL	3.6	NULL	NULL	4-Jun-14
			NULL	NULL	1	NULL	NULL	8-Jul-14
			NULL	NULL	1.0	NULL	NULL	3-Jul-14
			NULL	NULL	1.3	NULL	NULL	3-Sep-14
			NULL	NULL	13.3	NULL	NULL	3-Oct-14
			NULL	NULL	2.4	NULL	NULL	3-Nov-14
			NULL	NULL	3	NULL	NULL	4-Dec-14
			NULL	NULL	>13.3	NULL	NULL	6-Jan-15
			NULL	NULL	12.1	NULL	NULL	6-Feb-15
			NULL	NULL	1.0	NULL	NULL	2-Mar-15
			NULL	NULL	1.9	NULL	NULL	7-Apr-15
			NULL	NULL	1.0	NULL	NULL	5-May-15
			NULL	NULL	10.1	NULL	NULL	5-Jun-15
			NULL	NULL	2.4	NULL	NULL	7-Jul-15
			NULL	NULL	1.0	NULL	NULL	5-Aug-15
			NULL	NULL	1.8	NULL	NULL	3-Sep-15
			NULL	NULL	1.2	NULL	NULL	5-Oct-15
			NULL	NULL	1.3	NULL	NULL	4-Nov-15
	157	CL2, TOTAL CONTACT	NULL	NULL	NULL	1.01	NULL	11-Jul-11
	Conc =	*m g/L*	NULL	NULL	NULL	1.19	NULL	9-Aug-11

			NULL	NULL	NULL	1.00	NULL	13-Sep-11
			NULL	NULL	NULL	1.02	NULL	5-Oct-11
			NULL	NULL	NULL	1.32	NULL	2-Nov-11
			NULL	NULL	NULL	1.13	NULL	6-Dec-11
			NULL	NULL	NULL	1.02	NULL	4-Jan-12
			NULL	NULL	NULL	1.30	NULL	7-Feb-12
			NULL	NULL	NULL	1.22	NULL	8-Mar-12
			NULL	NULL	NULL	1.21	NULL	9-Apr-12
			NULL	NULL	NULL	1.02	NULL	4-May-12
			NULL	NULL	NULL	1.01	NULL	5-Jun-12
			NULL	NULL	NULL	1.01	NULL	3-Jul-12
			NULL	NULL	NULL	1.09	NULL	6-Aug-12
			NULL	NULL	NULL	1.00	NULL	6-Sep-12
			NULL	NULL	NULL	1.02	NULL	4-Oct-12
			NULL	NULL	NULL	1.02	NULL	6-Nov-12
			NULL	NULL	NULL	1.30	NULL	4-Dec-12
			NULL	NULL	NULL	1.67	NULL	9-Jan-13
			NULL	NULL	NULL	1.46	NULL	7-Feb-13
			NULL	NULL	NULL	1.99	NULL	8-Mar-13
			NULL	NULL	NULL	1.37	NULL	4-Apr-13
			NULL	NULL	NULL	1.34	NULL	3-May-13
			NULL	NULL	NULL	1.00	NULL	7-Jun-13
			NULL	NULL	NULL	1.02	NULL	5-Jul-13
			NULL	NULL	NULL	1.03	NULL	7-Aug-13
			NULL	NULL	NULL	1.36	NULL	6-Sep-13
			NULL	NULL	NULL	1.02	NULL	7-Oct-13
			NULL	NULL	NULL	1.03	NULL	4-Nov-13
			NULL	NULL	NULL	1.02	NULL	3-Dec-13
			NULL	NULL	NULL	1.01	NULL	7-Jan-14
			NULL	NULL	NULL	1.04	NULL	5-Feb-14
			NULL	NULL	NULL	1.02	NULL	4-Mar-14
			NULL	NULL	NULL	1.25	NULL	7-Apr-14
			NULL	NULL	NULL	2.24	NULL	6-May-14
			NULL	NULL	NULL	1.00	NULL	4-Jun-14
			NULL	NULL	NULL	1.02	NULL	8-Jul-14
			NULL	NULL	NULL	1.13	NULL	3-Jul-14
			NULL	NULL	NULL	1.03	NULL	3-Sep-14
			NULL	NULL	NULL	1.02	NULL	3-Oct-14
			NULL	NULL	NULL	1.02	NULL	3-Nov-14
			NULL	NULL	NULL	1.04	NULL	4-Dec-14
			NULL	NULL	NULL	1.04	NULL	6-Jan-15
			NULL	NULL	NULL	1.03	NULL	6-Feb-15
			NULL	NULL	NULL	1.03	NULL	2-Mar-15
			NULL	NULL	NULL	1.05	NULL	7-Apr-15
			NULL	NULL	NULL	1.23	NULL	5-May-15
			NULL	NULL	NULL	1.48	NULL	5-Jun-15
			NULL	NULL	NULL	1.07	NULL	7-Jul-15
			NULL	NULL	NULL	1.05	NULL	5-Aug-15
			NULL	NULL	NULL	1.23	NULL	3-Sep-15
			NULL	NULL	NULL	1.03	NULL	5-Oct-15
			NULL	NULL	NULL	1.9	NULL	4-Nov-15
	213	CL2, INST TECH MIN LIMIT	NULL	NULL	NULL	1.01	NULL	11-Jul-11
	Conc =	*m g/L*	NULL	NULL	NULL	1.19	NULL	9-Aug-11

			NULL	NULL	NULL	1.00	NULL	13-Sep-11
			NULL	NULL	NULL	1.02	NULL	5-Oct-11
			NULL	NULL	NULL	1.32	NULL	2-Nov-11
			NULL	NULL	NULL	1.13	NULL	6-Dec-11
			NULL	NULL	NULL	1.02	NULL	4-Jan-12
			NULL	NULL	NULL	1.30	NULL	7-Feb-12
			NULL	NULL	NULL	1.22	NULL	8-Mar-12
			NULL	NULL	NULL	1.21	NULL	9-Apr-12
			NULL	NULL	NULL	1.02	NULL	4-May-12
			NULL	NULL	NULL	1.01	NULL	5-Jun-12
			NULL	NULL	NULL	1.01	NULL	3-Jul-12
			NULL	NULL	NULL	1.09	NULL	6-Aug-12
			NULL	NULL	NULL	1.00	NULL	6-Sep-12
			NULL	NULL	NULL	1.02	NULL	4-Oct-12
			NULL	NULL	NULL	1.02	NULL	6-Nov-12
			NULL	NULL	NULL	1.30	NULL	4-Dec-12
			NULL	NULL	NULL	1.67	NULL	9-Jan-13
			NULL	NULL	NULL	1.46	NULL	7-Feb-13
			NULL	NULL	NULL	1.99	NULL	8-Mar-13
			NULL	NULL	NULL	1.37	NULL	4-Apr-13
			NULL	NULL	NULL	1.34	NULL	3-May-13
			NULL	NULL	NULL	1.00	NULL	7-Jun-13
			NULL	NULL	NULL	1.02	NULL	5-Jul-13
			NULL	NULL	NULL	1.03	NULL	7-Aug-13
			NULL	NULL	NULL	1.36	NULL	6-Sep-13
			NULL	NULL	NULL	1.02	NULL	7-Oct-13
			NULL	NULL	NULL	1.03	NULL	4-Nov-13
			NULL	NULL	NULL	1.02	NULL	3-Dec-13
			NULL	NULL	NULL	1.01	NULL	7-Jan-14
			NULL	NULL	NULL	1.04	NULL	5-Feb-14
			NULL	NULL	NULL	1.02	NULL	4-Mar-14
			NULL	NULL	NULL	1.25	NULL	7-Apr-14
			NULL	NULL	NULL	2.24	NULL	6-May-14
			NULL	NULL	NULL	1.00	NULL	4-Jun-14
			NULL	NULL	NULL	1.02	NULL	8-Jul-14
			NULL	NULL	NULL	1.13	NULL	3-Jul-14
			NULL	NULL	NULL	1.03	NULL	3-Sep-14
			NULL	NULL	NULL	1.02	NULL	3-Oct-14
			NULL	NULL	NULL	1.02	NULL	3-Nov-14
			NULL	NULL	NULL	1.04	NULL	4-Dec-14
			NULL	NULL	NULL	1.04	NULL	6-Jan-15
			NULL	NULL	NULL	1.03	NULL	6-Feb-15
			NULL	NULL	NULL	1.03	NULL	2-Mar-15
			NULL	NULL	NULL	1.05	NULL	7-Apr-15
			NULL	NULL	NULL	1.23	NULL	5-May-15
			NULL	NULL	NULL	1.48	NULL	5-Jun-15
			NULL	NULL	NULL	1.07	NULL	7-Jul-15
			NULL	NULL	NULL	1.05	NULL	5-Aug-15
			NULL	NULL	NULL	1.23	NULL	3-Sep-15
			NULL	NULL	NULL	1.03	NULL	5-Oct-15
			NULL	NULL	NULL	1.19	NULL	4-Nov-15

FACILITY NAME AND PERMIT NUMBER:
Stony Creek WWTF Permit No. VA0062669

Form Approved 1/14/99
OMB Number 2040-0086

A.11. Description of Treatment.

a. What levels of treatment are provided? Check all that apply.

✓ Primary ✓ Secondary

___ Advanced ___ Other. Describe: ___

b. Indicate the following removal rates (as applicable):

Design BOD_5 removal or Design $CBOD_5$ removal	85%	%
Design SS removal	85%	%
Design P removal	N/A	%
Design N removal	N/A	%
Other ___	N/A	%

c. What type of disinfection is used for the effluent from this outfall? If disinfection varies by season, please describe.

Chlorine Tabs

If disinfection is by chlorination, is dechlorination used for this outfall? ✓ Yes ___ No

d. Does the treatment plant have post aeration? ___ Yes ✓ No

A.12. Effluent Testing Information. All Applicants that discharge to waters of the US must provide effluent testing data for the following parameters. Provide the indicated effluent testing required by the permitting authority for each outfall through which effluent is discharged. Do not include information on combined sewer overflows in this section. All information reported must be based on data collected through analysis conducted using 40 CFR Part 136 methods. In addition, this data must comply with QA/QC requirements of 40 CFR Part 136 and other appropriate QA/QC requirements for standard methods for analytes not addressed by 40 CFR Part 136. At a minimum, effluent testing data must be based on at least three samples and must be no more than four and one-half years apart.

Outfall number: 001

PARAMETER	MAXIMUM DAILY VALUE		AVERAGE DAILY VALUE		
	Value	Units	Value	Units	Number of Samples
pH (Minimum)	7.76	s.u.			
pH (Maximum)	8.27	s.u.			
Flow Rate	0.0377	MGD	0.0330	MGD	11
Temperature (Winter)	14.3	degrees C	8.8	degrees C	5
Temperature (Summer)	28.3	degrees C	24.9	degrees C	6

* For pH please report a minimum and a maximum daily value

POLLUTANT		MAXIMUM DAILY DISCHARGE		AVERAGE DAILY DISCHARGE			ANALYTICAL METHOD	ML / MDL
		Conc.	Units	Conc.	Units	Number of Samples		
CONVENTIONAL AND NONCONVENTIONAL COMPOUNDS.								
BIOCHEMICAL OXYGEN	BOD-5	36	mg/l	17.82	mg/l	11	5210B	2.0
DEMAND (Report one)	CBOD-5		mg/l		mg/l		5201B	
FECAL COLIFORM		13.0	MPN100ml	2.73	MPN100m	11	9221C&E	2.0
TOTAL SUSPENDED SOLIDS (TSS)		36	mg/l	17.15	mg/l	11	2540D	1.0

END OF PART A.
REFER TO THE APPLICATION OVERVIEW TO DETERMINE WHICH OTHER PARTS OF FORM 2A YOU MUST COMPLETE

Stony Creek FORM 2A Data

Date	pH mg/l	Flow MGD	Temp Deg Celsius Winter	Temp Deg Celsius Summer	E Coli #/100ML	BOD mg/l	CBOD - 5 mg/l	TSS mg/l	Ammonia mg/l	Cl2 mg/l	D.O. mg/l	TKN mg/l	NO3/NO2 mg/l	O & G mg/l	Phos mg/l	TDS mg/l
1/21/2014	7.87	0.0299	6.5		1.00	17.00		13.00			11.39					
3/13/2014	7.89	0.0295	11.6		1.00	10.00		16.00			8.8					
5/20/2014	7.94	0.0326		22.1	1.00	22.00		36.00			7.46					
7/17/2014	8.00	0.0373		26.5	1.00	11.00		8.30			6.57					
9/19/2014	7.79	0.0306		22.5	8.00	12.00		7.40			8.84					
12/9/2014	7.94	0.0266	8.4		13.00	9.00		10			10.11					
2/7/2015	8.27	0.0350	3.2		1.00	26.00		17			11.32					
3/17/2015	7.98	0.0377	14.3		1.00	21.00		12.00			8.54					
5/8/2015	8.14	0.0351		22.8	1.00	36.00		21.00			8.02					
6/18/2015	7.91	0.0322		28.3	1.00	20.00		15.00			7.16					
7/14/2015	7.76	0.0368		27.3	1.00	12.00		33.00			7.01					
G or C	**G**				**G**	**C**	**C**	**C**	**C**	**G**	**G**	**C**	**C**	**G**	**C**	**C**
Minimum	7.76	0.0266	3.2	22.1	1.00	9.00	0.00	7.40		0.00	6.57		0.00		0.00	0
Maximum	8.27	0.0377	14.3	28.3	13.00	36.00	0.00	36.00		0.00	11.39		0.00		0.00	0
Average	7.95	0.0330	8.8	24.9	2.73	17.82	#DIV/0!	17.15		0.00	9		#DIV/0!		#DIV/0!	#DIV/0!
# Samples	**11**	**11**	**5**	**6**	**11**	**11**		**11**		**0**	**11**		**0**		**0**	**0**

Note: "0" results represent analysis that was below detection limits

4385 Beef Steak Road
Waverly, Virginia 23890
Phone: (804) 834-8930
Fax: (804) 834-8933

Sussex Service Authority

RECEIVED
JUN 18 2012
PRO

June 15, 2012

Emilee C. Adamson
Water Permit Writer, Senior
Virginia DEQ, Piedmont Regional Office
4949-A Cox Road
Glen Allen, Virginia 23060

VIA: E-MAIL on 6/15/12
Original via U.S.Mail

RE: Completed ATTACHMENT A for
Stony Creek Wastewater Treatment Facility
VPDES Permit No. VA0088978

Dear Mrs. Adamson:

Enclosed please find our completed Attachment A hereby submitted in accordance with the above referenced permit number, specifically Section C – Special Condition 10. Also, attached you will find a copy of the report of analysis that was prepared by James R. Reed & Associates in support of the Attachment A.

We thank you for your patience on receipt of this Attachment A and if you have any questions regarding this submission, please contact me at (804)834-6903.

Respectfully submitted,

Michael P. Kearns

Michael P. Kearns
Engineer

CC: Robert Magette, Plant Manager, Sussex Service Authority
Frank H. Irving, Executive Director, Sussex Service Authority

ATTACHMENT A
DEPARTMENT OF ENVIRONMENTAL QUALITY
WATER QUALITY CRITERIA MONITORING

CASRN#	CHEMICAL	EPA ANALYSIS NO.	QUANTIFICATION LEVEL[1]	REPORTING RESULTS	SAMPLE TYPE[2]	SAMPLE FREQUENCY	
METALS							
7440-36-0	Antimony, dissolved	(3)	1.4	<0.5	G or C	1/5 YR	
7440-38-2	Arsenic, dissolved	(3)	1.0	<0.5	G or C	1/5 YR	
7440-43-9	Cadmium, dissolved	(3)	0.3	<0.08	G or C	1/5 YR	
16065-83-1	Chromium III, dissolved [8]	(3)	3.6	<3	G or C	1/5 YR	
18540-29-9	Chromium VI, dissolved [8]	(3)	1.6	<3	G or C	1/5 YR	
7440-50-8	Copper, dissolved	(3)	0.50	5.0	G or C	1/5 YR	✓
7439-92-1	Lead, dissolved	(3)	0.50	<0.10	G or C	1/5 YR	
7439-97-6	Mercury, dissolved	(3)	1.0	<0.20	G or C	1/5 YR	
7440-02-0	Nickel, dissolved	(3)	0.94	2.4	G or C	1/5 YR	✓
7782-49-2	Selenium, Total Recoverable	(3)	2.0	<0.5	G or C	1/5 YR	
7440-22-4	Silver, dissolved	(3)	0.20	<0.5	G or C	1/5 YR	
7440-28-0	Thallium, dissolved	(4)	(5)	<5	G or C	1/5 YR	
7440-66-6	Zinc, dissolved	(3)	3.6	10	G or C	1/5 YR	✓
PESTICIDES/PCB'S							
309-00-2	Aldrin	608	0.05	<0.05	G or C	1/5 YR	
57-74-9	Chlordane	608	0.2	<0.2	G or C	1/5 YR	
2921-88-2	Chlorpyrifos (synonym = Dursban)	(4)	(5)	<0.2	G or C	1/5 YR	
72-54-8	DDD	608	0.1	<0.05	G or C	1/5 YR	
72-55-9	DDE	608	0.1	<0.05	G or C	1/5 YR	
50-29-3	DDT	608	0.1	<0.05	G or C	1/5 YR	
8065-48-3	Demeton	(4)	(5)	<1	G or C	1/5 YR	
333-41-5	Diazinon	(4)	(5)	<1	G or C	1/5 YR	
60-57-1	Dieldrin	608	0.1	<0.05	G or C	1/5 YR	
959-98-8	Alpha-Endosulfan	608	0.1	<0.05	G or C	1/5 YR	
33213-65-9	Beta-Endosulfan	608	0.1	<0.05	G or C	1/5 YR	
1031-07-8	Endosulfan Sulfate	608	0.1	<0.05	G or C	1/5 YR	

CASRN#	CHEMICAL	EPA ANALYSIS NO.	QUANTIFICATION LEVEL[1]	REPORTING RESULTS	SAMPLE TYPE[2]	SAMPLE FREQUENCY
72-20-8	Endrin	608	0.1	<0.05	G or C	1/5 YR
7421-93-4	Endrin Aldehyde	(4)	(5)	<0.05	G or C	1/5 YR
86-50-0	Guthion	(4)	(5)	<1	G or C	1/5 YR
76-44-8	Heptachlor	608	0.05	<0.05	G or C	1/5 YR
1024-57-3	Heptachlor Epoxide	(4)	(5)	<0.05	G or C	1/5 YR
319-84-6	Hexachlorocyclohexane Alpha-BHC	608	(5)	<0.05	G or C	1/5 YR
319-85-7	Hexachlorocyclohexane Beta-BHC	608	(5)	<0.05	G or C	1/5 YR
58-89-9	Hexachlorocyclohexane Gamma-BHC or Lindane	608	(5)	<0.05	G or C	1/5 YR
143-50-0	Kepone	(9)	(5)	<5	G or C	1/5 YR
121-75-5	Malathion	(4)	(5)	<1	G or C	1/5 YR
72-43-5	Methoxychlor	(4)	(5)	<0.05	G or C	1/5 YR
2385-85-5	Mirex	(4)	(5)	<0.05	G or C	1/5 YR
56-38-2	Parathion	(4)	(5)	<1	G or C	1/5 YR
1336-36-3	PCB Total	608	7.0	<0.5	G or C	1/5 YR
8001-35-2	Toxaphene	608	5.0	<0.5	G or C	1/5 YR
BASE NEUTRAL EXTRACTABLES						
83-32-9	Acenaphthene	625	10.0	<5	G or C	1/5 YR
120-12-7	Anthracene	625	10.0	<5	G or C	1/5 YR
92-87-5	Benzidine	(4)	(5)	<5	G or C	1/5 YR
56-55-3	Benzo (a) anthracene	625	10.0	<5	G or C	1/5 YR
205-99-2	Benzo (b) fluoranthene	625	10.0	<5	G or C	1/5 YR
207-08-9	Benzo (k) fluoranthene	625	10.0	<5	G or C	1/5 YR
50-32-8	Benzo (a) pyrene	625	10.0	<5	G or C	1/5 YR
111-44-4	Bis 2-Chloroethyl Ether	(4)	(5)	<5	G or C	1/5 YR
108-60-1	Bis 2-Chloroisopropyl Ether	(4)	(5)	<5	G or C	1/5 YR
85-68-7	Butyl benzyl phthalate	625	10.0	<5	G or C	1/5 YR
91-58-7	2-Chloronaphthalene	(4)	(5)	<5	G or C	1/5 YR
218-01-9	Chrysene	625	10.0	<5	G or C	1/5 YR
53-70-3	Dibenz(a,h)anthracene	625	20.0	<5	G or C	1/5 YR

CASRN#	CHEMICAL	EPA ANALYSIS NO.	QUANTIFICATION LEVEL[1]	REPORTING RESULTS	SAMPLE TYPE[2]	SAMPLE FREQUENCY
84-74-2	Dibutyl phthalate (synonym = Di-n-Butyl Phthalate)	625	10.0	<5	G or C	1/5 YR
95-50-1	1,2-Dichlorobenzene	624	10.0	<5	G or C	1/5 YR
541-73-1	1,3-Dichlorobenzene	624	10.0	<5	G or C	1/5 YR
106-46-7	1,4-Dichlorobenzene	624	10.0	<5	G or C	1/5 YR
91-94-1	3,3-Dichlorobenzidine	(4)	(5)	<5	G or C	1/5 YR
84-66-2	Diethyl phthalate	625	10.0	<5	G or C	1/5 YR
117-81-7	Bis-2-ethylhexyl phthalate	625	10.0	<5	G or C	1/5 YR
131-11-3	Dimethyl phthalate	(4)	(5)	<5	G or C	1/5 YR
121-14-2	2,4-Dinitrotoluene	625	10.0	<5	G or C	1/5 YR
122-66-7	1,2-Diphenylhydrazine	(4)	(5)	<5	G or C	1/5 YR
206-44-0	Fluoranthene	625	10.0	<5	G or C	1/5 YR
86-73-7	Fluorene	625	10.0	<5	G or C	1/5 YR
118-74-1	Hexachlorobenzene	(4)	(5)	<5	G or C	1/5 YR
87-68-3	Hexachlorobutadiene	(4)	(5)	<5	G or C	1/5 YR
77-47-4	Hexachlorocyclopentadiene	(4)	(5)	<5	G or C	1/5 YR
67-72-1	Hexachloroethane	(4)	(5)	<5	G or C	1/5 YR
193-39-5	Indeno(1,2,3-cd)pyrene	625	20.0	<5	G or C	1/5 YR
78-59-1	Isophorone	625	10.0	<5	G or C	1/5 YR
98-95-3	Nitrobenzene	625	10.0	<5	G or C	1/5 YR
62-75-9	N-Nitrosodimethylamine	(4)	(5)	<5	G or C	1/5 YR
621-64-7	N-Nitrosodi-n-propylamine	(4)	(5)	<5	G or C	1/5 YR
86-30-6	N-Nitrosodiphenylamine	(4)	(5)	<5	G or C	1/5 YR
129-00-0	Pyrene	625	10.0	<5	G or C	1/5 YR
120-82-1	1,2,4-Trichlorobenzene	625	10.0	<5	G or C	1/5 YR
	VOLATILES					
107-02-8	Acrolein	(4)	(5)	<50	G	1/5 YR
107-13-1	Acrylonitrile	(4)	(5)	<50	G	1/5 YR
71-43-2	Benzene	624	10.0	<5	G	1/5 YR
75-25-2	Bromoform	624	10.0	<5	G	1/5 YR

CASRN#	CHEMICAL	EPA ANALYSIS NO.	QUANTIFICATION LEVEL[1]	REPORTING RESULTS	SAMPLE TYPE[2]	SAMPLE FREQUENCY
56-23-5	Carbon Tetrachloride	624	10.0	<5	G	1/5 YR
108-90-7	Chlorobenzene (synonym = monochlorobenzene)	624	50.0	<5	G	1/5 YR
124-48-1	Chlorodibromomethane	624	10.0	<5	G	1/5 YR
67-66-3	Chloroform	624	10.0	<5	G	1/5 YR
75-09-2	Dichloromethane (synonym = methylene chloride)	624	20.0	<5	G	1/5 YR
75-27-4	Dichlorobromomethane	624	10.0	<5	G	1/5 YR
107-06-2	1,2-Dichloroethane	624	10.0	<5	G	1/5 YR
75-35-4	1,1-Dichloroethylene	624	10.0	<5	G	1/5 YR
156-60-5	1,2-trans-dichloroethylene	(4)	(5)	<5	G	1/5 YR
78-87-5	1,2-Dichloropropane	(4)	(5)	<5	G	1/5 YR
542-75-6	1,3-Dichloropropene	(4)	(5)	<5	G	1/5 YR
100-41-4	Ethylbenzene	624	10.0	<5	G	1/5 YR
74-83-9	Methyl Bromide	(4)	(5)	<5	G	1/5 YR
79-34-5	1,1,2,2-Tetrachloroethane	(4)	(5)	<5	G	1/5 YR
127-18-4	Tetrachloroethylene	624	10.0	<5	G	1/5 YR
10-88-3	Toluene	624	10.0	<5	G	1/5 YR
79-00-5	1,1,2-Trichloroethane	(4)	(5)	<5	G	1/5 YR
79-01-6	Trichloroethylene	624	10.0	<5	G	1/5 YR
75-01-4	Vinyl Chloride	624	10.0	<5	G	1/5 YR
ACID EXTRACTABLES [6]						
95-57-8	2-Chlorophenol	625	10.0	<5	G or C	1/5 YR
120-83-2	2,4 Dichlorophenol	625	10.0	<5	G or C	1/5 YR
105-67-9	2,4 Dimethylphenol	625	10.0	<5	G or C	1/5 YR
51-28-5	2,4-Dinitrophenol	(4)	(5)	<20	G or C	1/5 YR
534-52-1	2-Methyl-4,6-Dinitrophenol	(4)	(5)	<5	G or C	1/5 YR
25154-52-3	Nonylphenol	(5)	(5)	<5	G or C	1/5 YR
87-86-5	Pentachlorophenol	625	50.0	<10	G or C	1/5 YR
108-95-2	Phenol	625	10.0	<5	G or C	1/5 YR
88-06-2	2,4,6-Trichlorophenol	625	10.0	<5	G or C	1/5 YR

CASRN#	CHEMICAL	EPA ANALYSIS NO.	QUANTIFICATION LEVEL[1]	REPORTING RESULTS	SAMPLE TYPE[2]	SAMPLE FREQUENCY
			MISCELLANEOUS			
776-41-7	Ammonia as NH3-N	350.1	200	1210	C	1/5 YR
16887-00-6	Chlorides	(4)	(5)	62	C	1/5 YR
7782-50-5	Chlorine, Total Residual	(4)	100	0.04	G	1/5 YR
57-12-5	Cyanide, Free	(4)	10.0	<5	G	1/5 YR
N/A	*E. coli* (N/CML)	(4)	(5)	<1MPN/100	G	1/5 YR
7783-06-4	Dissolved Sulfide	(5)	(5)	<0.027	G	1/5 YR
60-10-5	Tributyltin [7]	NBSR 85-3295	(5)	<0.03	G or C	1/5 YR
471-34-1	Hardness (mg/L as $CaCO_3$)	(4)	(5)	47.3	G or C (10)	1/5 YR

Frank H. Irving, Executive Director

Name of Principal Exec. Officer or Authorized Agent/Title

Signature of Principal Officer or Authorized Agent/Date

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment for knowing violations. See 18 U.S.C. Sec. 1001 and 33 U.S.C. Sec. 1319. (Penalties under these statutes may include fines up to $10,000 and or maximum imprisonment of between 6 months and 5 years.)

FOOTNOTES:

(1) Quantification level (QL) is defined as the lowest concentration used for the calibration of a measurement system when the calibration is in accordance with the procedures published for the required method.

The quantification levels indicated for the metals are actually Specific Target Values developed for this permit. The Specific Target Value is the approximate value that may initiate a wasteload allocation analysis. Target values are not wasteload allocations or effluent limitations. The Specific Target Values are subject to change based on additional information such as hardness data, receiving stream flow, and design flows.

Units for the quantification level are micrograms/liter unless otherwise specified.

Quality control and quality assurance information shall be submitted to document that the required quantification level has been attained.

(2) Sample Type

G = Grab = An individual sample collected in less than 15 minutes. Substances specified with "grab" sample type shall only be collected as grabs. The permittee may analyze multiple grabs and report the average results provided that the individual grab results are also reported. For grab metals

samples, the individual samples shall be filtered and preserved immediately upon collection.

C = Composite = A 24-hour **(PW - Revise as required to require same composite duration as BOD_5)** composite unless otherwise specified. The composite shall be a combination of individual samples, taken proportional to flow, obtained at hourly or smaller time intervals. The individual samples may be of equal volume for flows that do not vary by +/- 10 percent over a 24-hour period.

(3) A specific analytical method is not specified; however a target value for each metal has been established. An appropriate method to meet the target value shall be selected from the following list of EPA methods (or any approved method presented in 40 CFR Part 136). If the test result is less than the method QL, a "<[QL]" shall be reported where the actual analytical test QL is substituted for [QL].

Metal	Analytical Method
Antimony	1638; 1639
Arsenic	1632
Chromium[8]	1639
Cadmium	1637; 1638; 1639; 1640
Chromium VI	1639
Copper	1638; 1640
Lead	1637; 1638; 1640
Mercury	1631
Nickel	1638; 1639; 1640
Selenium	1638; 1639
Silver	1638
Zinc	1638; 1639
Free Cyanide	ASTM D4282-02, D7237-10
Nonylphenol	ASTM D7065-06

(4) Any approved method presented in 40 CFR Part 136.

(5) The QL is at the discretion of the permittee. For any substances addressed in 40 CFR Part 136, the permittee shall use one of the approved methods in 40 CFR Part 136.

(6) Testing for phenols requires continuous extraction.

(7) Analytical Methods: NBSR 85-3295 or DEQ's approved analysis for Tributyltin may also be used [See A Manual for the Analysis of Butyltins in Environmental Systems by the Virginia Institute of Marine Science, dated November 1996].

(8) Both Chromium III and Chromium VI may be measured by the total chromium analysis. If the result of the total chromium analysis is less than or equal to the lesser of the Chromium III or Chromium VI method QL, the results for both Chromium III and Chromium VI can be reported as "<[QL]", where the actual analytical test QL is substituted for [QL].

(9) The lab may use SW846 Method 8270D provided the lab has an Initial Demonstration of Capability, has passed a PT for Kepone, and meets the acceptance criteria for Kepone as given in Method 8270D

(10) The sample type for Hardness (as $CaCO_3$) shall match the sample type selected for Dissolved Metals.

REPORT OF ANALYSIS

CLIENT: Sussex Service Authority
ATTN: Bob Magette
ADDRESS: 4385 Beef Steak Road
Waverly, Va 23890
PHONE: (804) 691-4582
FAX: rmagette@ssa-va.org

Special Notes:
Stoney Creek Permit Attachment A (1/5 Years)

SAMPLE COLLECTED BY: CLIENT
GRAB COLLECTION:
Date: 5/16/12 Time: 0921
COMPOSITE COLLECTION:
Start Date: Time:
End Date: Time:

PICK UP BY: REED - LL
SAMPLE RECEIPT:
Date: 5/16/12 Time: 1352
NUMBER OF CONTAINERS: 3
SAMPLE CONDITION: ☑ Good ☐ Other (See C-O-C)
REPORT NO: 12-07644 13:34

SAMPLE ID: Outfall 001
SAMPLE NO: 12-07644

Parameter	Method Number	JRA QL	Result	Unit	Analyst	Date	Time
Dissolved Antimony	200.8	0.0005	<0.0005	mg/L	PAC	6/6/12	2033
Dissolved Arsenic	200.8	0.0005	<0.0005	mg/L	PAC	6/6/12	2033
Dissolved Cadmium	200.8	0.00008	<0.00008	mg/L	PAC	6/6/12	2033
Dissolved Copper	200.8	0.0005	0.0050	mg/L	PAC	6/6/12	2033
Dissolved Lead	200.8	0.0001	<0.0001	mg/L	PAC	6/6/12	2033
Dissolved Nickel	200.8	0.0005	0.0024	mg/L	PAC	6/6/12	2033
Dissolved Silver	200.8	0.0005	<0.0005	mg/L	PAC	6/6/12	2033
Dissolved Hexavalent Chromium	*3500Cr B	0.003	< 0.003	mg/L	EFA	5/16/12	1512
Dissolved Mercury	245.1	0.0002	< 0.0002	mg/L	LEF	5/21/12	1426
Dissolved Chromium	200.7	0.001	< 0.001	mg/L	EFA	5/23/12	1337
Dissolved Chromium III	200.7	0.003	< 0.003	mg/L	EFA	5/23/12	1337
Dissolved Thallium	200.7	0.005	< 0.005	mg/L	EFA	5/23/12	1337
Dissolved Zinc	200.7	0.001	0.010	mg/L	EFA	5/29/12	1401

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VELAP# 460013
EPA# VA00015

REPORT OF ANALYSIS

SAMPLE ID: Outfall 001
SAMPLE NO: 12-07644

Parameter	Method Number	JRA QL	Result	Unit	Analyst Date	Time

NOTES:

JRA Quantification Level is the concentration of the lowest calibration standard above zero with a reliable signal.

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The results on this report relate only to the sample(s) provided for analysis.

Results conform to NELAC standards, where applicable, unless otherwise indicated.

*SM 20 Ed.

Dissolved Metals filtered and preserved in the field.
Method 200.8 subcontracted to meet QL requirements.

Zinc concentrated to meet Permit QL.

Authorized By: Elaine Claiborne

Elaine Claiborne, Laboratory Director

Date: 08-Jun-12

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VELAP# 460013
EPA# VA00015

5t

CHAIN OF CUSTODY

Company Name: Sussex Service Authority
Company Contact: Mike Kearns Telephone: 804-834-8930
Results To: Bob Majette (804-691-4582) Fax: 804-834-8933
Address: 4385 Beef Steak Road, Waverly, VA 23890
email result to: rmajette@ssa-va.org
Project ID: **Stoney Creek PermitAttachment A (1/5 Years)**

ANALYSES REQUESTED

Bottle ID	A	B
Preserv.	2	1
	Dis. Metals* (Grab)	Diss Hex.Cr**(Grab)
	pH<2 HNO_3	

JRA ID # 12	Sample Type*	Sample Location	Composite Start Date	Composite Start Time	Composite End Date	Composite End Time	Grab Date	Grab Time	Total # of cont.	Dis. Metals* (Grab)	Diss Hex.Cr**(Grab)
07644	WW	Outfall 001					5/16/12	0921	3	X	X

*WW= Wastewater, GW = Groundwater, DW - Drinking Water, HW - Hazardous Waste, OTHERS

Sampled By: Robert Joyner Date/Time: 5/16/12 0921
Relinquished By: Robert Joyner Date/Time: 5/16/12
Received By: [illegible] Date/Time: 5/16/12 1352 1210
Relinquished By: [illegible] Date/Time: 5/16/12 1352
Received By: [illegible] Date/Time: 5/16/12 1352

Preservatives:
1 = <6°C 6 = $Na_2S_2O_3$ + HCl 10=Ascorbic Acid + HCl
2 = HNO_3 7 = NaOH + ZnOAc 11=HCl
3 = H_2SO_4 8 = H_2SO_4 + FAS 12=Zinc Acetate + NaOH
4 = NaOH 9 = NH_4Cl 13=Na_2SO_3 + HCl
5 = $Na_2S_2O_3$ 14=Na_2SO_3 + H_2SO_4

✓ for Compliance
___ Not for Compliance

Refrin Lab
Split Sub

Dissolved Metals Filtration: Date: 5/16/12 Time: 0921 Initials RJ
*Sb,As,Cd,Cu,Pb,Ni,,Ag,Zn **(Subcontract)**
Hg, Cr, Cr III, Tl (in house)
**24 hour holding time, Dissolved Hex. Cr
** Filtration Date: 5/16/12 Time: 0921 Initials: RJ
***With Kepone, Diazinon and Nonylphenol.
****Radiological - Strontiun 90, Tritium, Beta Particle and Photon Activity, Gross Alpha Particle Activity

CN Interference Check: Positive Negative
Sulfide: ___ ___
Oxidizing Agent: ___ ___

Arrival Temp: 0.6 °C

Total Residual Chlorine ~~<0.05~~ Date/Time ___ Initials ___

JAMES R. REED and ASSOCIATES (757) 873-4703; FAX (757) 873-1498
770 Pilot House Drive, Newport News, VA 23606

REPORT OF ANALYSIS

CLIENT: Sussex Service Authority
ATTN: Bob Magette
ADDRESS: 4385 Beef Steak Road
Waverly, Va 23890
PHONE: (804) 691-4582
FAX: rmagette@ssa-va.org

Special Notes:
ATTACHMENT A (1/5 YEARS)
STONEY CREEK PERMIT APPLICATION

SAMPLE COLLECTED BY: CLIENT
GRAB COLLECTION DATE/TIME:
05/11/12@1047 - 1126

COMPOSITE COLLECTION:
Start Date: Time:
End Date: Time:

PICK UP BY: REED - BS
SAMPLE RECEIPT:
Date: 5/11/12 Time: 1430
NUMBER OF CONTAINERS: 26
SAMPLE CONDITION: ☑ Good ☐ Other (See C-O-C)
REPORT NO: 12-07402 13:37

SAMPLE ID: Outfall 001
SAMPLE NO: 12-07402

Parameter	Method Number	JRA QL	Result	Unit	Analyst	Date	Time
Volatiles							
Bromomethane	624	5	< 5	ug/L	CLH	5/12/12	0247
Vinyl Chloride	624	5	< 5	ug/L	CLH	5/12/12	0247
Methylene Chloride/Dichloromethane	624	5	< 5	ug/L	CLH	5/12/12	0247
1,1-Dichloroethene	624	5	< 5	ug/L	CLH	5/12/12	0247
Chloroform	624	5	< 5	ug/L	CLH	5/12/12	0247
1,2-Dichloroethane	624	5	< 5	ug/L	CLH	5/12/12	0247
Carbon Tetrachloride	624	5	< 5	ug/L	CLH	5/12/12	0247
Bromodichloromethane	624	5	< 5	ug/L	CLH	5/12/12	0247
1,1,2,2-Tetrachloroethane	624	5	< 5	ug/L	CLH	5/12/12	0247
1,2-Dichloropropane	624	5	< 5	ug/L	CLH	5/12/12	0247
Trichloroethene	624	5	< 5	ug/L	CLH	5/12/12	0247
Dibromochloromethane	624	5	< 5	ug/L	CLH	5/12/12	0247
1,1,2-Trichloroethane	624	5	< 5	ug/L	CLH	5/12/12	0247
Benzene	624	5	< 5	ug/L	CLH	5/12/12	0247
Bromoform	624	5	< 5	ug/L	CLH	5/12/12	0247
Tetrachloroethene	624	5	< 5	ug/L	CLH	5/12/12	0247
Toluene	624	5	< 5	ug/L	CLH	5/12/12	0247
Chlorobenzene/Monochlorobenzene	624	5	< 5	ug/L	CLH	5/12/12	0247
Ethylbenzene	624	5	< 5	ug/L	CLH	5/12/12	0247
Acrolein	624	50	< 50	ug/L	CLH	5/12/12	0247
Acrylonitrile	624	50	< 50	ug/L	CLH	5/12/12	0247
1,3-Dichloropropene(cis & trans)	624	5	< 5	ug/L	CLH	5/12/12	0247
1,2-Dichlorobenzene	624	5	< 5	ug/L	CLH	5/12/12	0247
1,3-Dichlorobenzene	624	5	< 5	ug/L	CLH	5/12/12	0247

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VELAP# 460013
EPA# VA00015

REPORT OF ANALYSIS

SAMPLE ID: Outfall 001
SAMPLE NO: 12-07402

Parameter	Method Number	JRA QL	Result	Unit	Analyst	Date	Time
Volatiles							
1,4-Dichlorobenzene	624	5	< 5	ug/L	CLH	5/12/12	0247
trans-1,2-Dichloroethene	624	5	< 5	ug/L	CLH	5/12/12	0247
Semi-Volatiles							
Hexachloroethane	625	5	< 5	ug/L	CLH	5/22/12	0240
1,2,4-Trichlorobenzene	625	5	< 5	ug/L	CLH	5/22/12	0240
Hexachlorobutadiene	625	5	< 5	ug/L	CLH	5/22/12	0240
Hexachlorocyclopentadiene	625	5	< 5	ug/L	CLH	5/22/12	0240
2-Chloronaphthalene	625	5	< 5	ug/L	CLH	5/22/12	0240
Hexachlorobenzene	625	5	< 5	ug/L	CLH	5/22/12	0240
N-Nitrosodimethylamine	625	5	< 5	ug/L	CLH	5/22/12	0240
Bis(2-chloroethyl) ether	625	5	< 5	ug/L	CLH	5/22/12	0240
Bis(2-chloroisopropyl) ether	625	5	< 5	ug/L	CLH	5/22/12	0240
N-Nitroso-di-n-propylamine	625	5	< 5	ug/L	CLH	5/22/12	0240
Nitrobenzene	625	5	< 5	ug/L	CLH	5/22/12	0240
Isophorone	625	5	< 5	ug/L	CLH	5/22/12	0240
Dimethyl phthalate	625	5	< 5	ug/L	CLH	5/22/12	0240
Acenaphthene	625	5	< 5	ug/L	CLH	5/22/12	0240
2,4-Dinitrotoluene	625	5	< 5	ug/L	CLH	5/22/12	0240
Fluorene	625	5	< 5	ug/L	CLH	5/22/12	0240
Diethyl phthalate	625	5	< 5	ug/L	CLH	5/22/12	0240
1,2,-Diphenylhydrazine	625	5	< 5	ug/L	CLH	5/22/12	0240
N-nitroso-di-phenylamine	625	5	< 5	ug/L	CLH	5/22/12	0240
Anthracene	625	5	< 5	ug/L	CLH	5/22/12	0240
di-n-Butyl phthalate	625	5	< 5	ug/L	CLH	5/22/12	0240
Fluoranthene	625	5	< 5	ug/L	CLH	5/22/12	0240
Pyrene	625	5	< 5	ug/L	CLH	5/22/12	0240
Benzidine	625	5	< 5	ug/L	CLH	5/22/12	0240
Butyl benzyl phthalate	625	5	< 5	ug/L	CLH	5/22/12	0240
Benzo[a]Anthracene	625	5	< 5	ug/L	CLH	5/22/12	0240
Chrysene	625	5	< 5	ug/L	CLH	5/22/12	0240
3,3-Dichlorobenzidine	625	5	< 5	ug/L	CLH	5/22/12	0240
Bis(2-ethylhexyl) phthalate	625	5	< 5	ug/L	CLH	5/22/12	0240
Benzo[b]Fluoranthene	625	5	< 5	ug/L	CLH	5/22/12	0240
Benzo[k]Fluoranthene	625	5	< 5	ug/L	CLH	5/22/12	0240
Benzo[a]Pyrene	625	5	< 5	ug/L	CLH	5/22/12	0240
Indeno[1,2,3-c,d]Pyrene	625	5	< 5	ug/L	CLH	5/22/12	0240
Dibenz[a,h]Anthracene	625	5	< 5	ug/L	CLH	5/22/12	0240
2-Chlorophenol	625	5	< 5	ug/L	CLH	5/22/12	0240
Phenol	625	5	< 5	ug/L	CLH	5/22/12	0240
2,4-Dimethylphenol	625	5	< 5	ug/L	CLH	5/22/12	0240
2,4-Dichlorophenol	625	5	< 5	ug/L	CLH	5/22/12	0240
2,4,6-Trichlorophenol	625	5	< 5	ug/L	CLH	5/22/12	0240

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VELAP# 460013
EPA# VA00015

REPORT OF ANALYSIS

SAMPLE ID: Outfall 001
SAMPLE NO: 12-07402

Parameter	Method Number	JRA QL	Result	Unit	Analyst	Date	Time
Semi-Volatiles							
2,4-Dinitrophenol	625	20	< 20	ug/L	CLH	5/22/12	0240
4,6 Dinitro-o-cresol	625	5	< 5	ug/L	CLH	5/22/12	0240
Pentachlorophenol	625	10	< 10	ug/L	CLH	5/22/12	0240
Kepone	8270D	5	< 5	ug/L	CLH	5/22/12	0240
Nonylphenol	D7065-06	5	< 5	ug/L	CLH	5/25/12	1815
Organophosphorus Pesticides							
Diazinon	614	1	< 1	ug/L	JLH	5/22/12	0209
Demeton	614	1	< 1	ug/L	JLH	5/22/12	0209
Malathion	614	1	< 1	ug/L	JLH	5/22/12	0209
Parathion	614	1	< 1	ug/L	JLH	5/22/12	0209
Organophosphorous Pesticides							
Chlorpyrifos	622	0.2	< 0.2	ug/L	JLH	5/22/12	0050
Guthion	622	1	< 1	ug/L	JLH	5/22/12	0050
Chlorinated Pesticides and PCBs							
Aldrin	608	0.05	< 0.05	ug/L	JLH	5/17/12	0427
Dieldrin	608	0.05	< 0.05	ug/L	JLH	5/17/12	0427
Chlordane	608	0.2	< 0.2	ug/L	JLH	5/17/12	0427
4,4-DDT	608	0.05	< 0.05	ug/L	JLH	5/17/12	0427
4,4-DDE	608	0.05	< 0.05	ug/L	JLH	5/17/12	0427
4,4-DDD	608	0.05	< 0.05	ug/L	JLH	5/17/12	0427
Endosulfan I	608	0.05	< 0.05	ug/L	JLH	5/17/12	0427
Endosulfan II	608	0.05	< 0.05	ug/L	JLH	5/17/12	0427
Endosulfan sulfate	608	0.05	< 0.05	ug/L	JLH	5/17/12	0427
Endrin	608	0.05	< 0.05	ug/L	JLH	5/17/12	0427
Endrin aldehyde	608	0.05	< 0.05	ug/L	JLH	5/17/12	0427
Heptachlor	608	0.05	< 0.05	ug/L	JLH	5/17/12	0427
Heptachlor epoxide	608	0.05	< 0.05	ug/L	JLH	5/17/12	0427
BHC-Alpha	608	0.05	< 0.05	ug/L	JLH	5/17/12	0427
BHC-Beta	608	0.05	< 0.05	ug/L	JLH	5/17/12	0427
BHC-Gamma (Lindane)	608	0.05	< 0.05	ug/L	JLH	5/17/12	0427
Toxaphene	608	0.5	< 0.5	ug/L	JLH	5/17/12	0427
Total Arochlors	608	0.5	< 0.5	ug/L	JLH	5/17/12	0427
Methoxychlor	8081B	0.05	< 0.05	ug/L	JLH	5/17/12	0427
Mirex	8081B	0.05	< 0.05	ug/L	JLH	5/17/12	0427
Ammonia	*4500NH3	0.10	1.21	mg/L	ARC	5/16/12	0830
Tributyltin	GC/FPD	0.03	<0.03	ug/L	UL	5/22/12	1700
Hardness	*2340B	0.331	47.3	mg/L	EFA	5/23/12	1455
E. Coli-Colilert	Colilert	1	<1	MPN/100m	JW	5/11/12	1450
Total Recoverable Selenium	200.8	0.0005	<0.0005	mg/L	PAC	6/6/12	2126
Chloride	*4500Cl C	1	62	mg/L	ARC	5/14/12	0945
Hydrogen Sulfide	*4500S2H	0.027	< 0.027	mg/L	LEF	5/17/12	0845
Total Chlorine	HACH 816	0.02	0.04	mg/L	RJ	5/11/12	1037

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VELAP# 460013
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REPORT OF ANALYSIS

SAMPLE ID: Outfall 001
SAMPLE NO: 12-07402

Parameter	Method Number	JRA QL	Result	Unit	Analyst	Date	Time
pH (lab)	*4500H+B		7.74@13oC	s.u.	ARC	5/11/12	1500
Conductivity@25oC	*2510B	2	553	umhos/cm	EFA	5/17/12	1600
Free Cyanide	*4500CNH	0.005	< 0.005	mg/L	LEF	5/16/12	1014

NOTES:

JRA Quantification Level is the concentration of the lowest calibration standard above zero with a reliable signal.

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The results on this report relate only to the sample(s) provided for analysis.

Results conform to NELAC standards, where applicable, unless otherwise indicated.

*SM 20 Ed., **SM 21 Ed.

Metals Method 200.8 subcontracted to Pace Laboratories
to meet QL requirements.

TBT subcontracted to Universal Laboratories.

Total Residual Chlorine analyzed by client.

Endosulfan I = Endosulfan Alpha, Endosulfan II = Endosulfan Beta
Bromodichloromethane = Dichlorobromomethane

Dibromochloromethane = Chlorodibromomethane

Bromomethane = Methyl bromide

2 Methyl-4,6 Dinitrophenol = 4,6 Dinitro-o-cresol

Authorized By: Elaine Claiborne

Elaine Claiborne, Laboratory Director

Date: 08-Jun-12

James R. Reed & Associates
770 Pilot House Drive, Newport News, VA 23606
(757) 873-4703 • Fax: (757) 873-1498

VELAP# 460013
EPA# VA00015

CHAIN OF CUSTODY

L38

Company Name: Sussex Service Authority
Company Contact: Mike Kearns Telephone: 804-834-8930
Results To: Bob Majette (804-691-4582 Fax: 804-834-8933
Address: 4385 Beef Steak Road, Waverly, VA 23890
email result to: rmajette@ssa-va.org
Project ID: **Attachment A (1/5 Years)**
Stoney Creek Permit Application

ANALYSES REQUESTED

Bottle ID	A	B	C	D	E	F	G	H	I	J	K	L	M	N
Preserv.	2	1	1,11	1,4	1,3	1	1	2	1,5	2	1	1,12	1,3	1
	Dis. Metals*	SVOL (608/8081, 622, 614, 625, Kepone)***	Volatiles (624)(Headspace free) (Grab)	Free Cyanide (Interference Check) (Grab)****	Ammonia (~~Comp~~) Grab	TBT (Subcontract)	Dissolved Hex. Cr VI** (24 hour holding time)	Hardness	E. Coli (6 hour holding)(Grab)	T. Rec. Selenium 200.8 (SUB)	Chloride (~~Comp~~) Grab	Hydrogen Sulfide (Grab)	Nonylphenol	pH/Conductivity (Grab)

JRA ID # 12	Sample Type*	Sample Location	Composite Start Date	Composite Start Time	Composite End Date	Composite End Time	Grab Date	Grab Time	Total # of cont.	Dis. Metals*	SVOL (608/8081, 622, 614, 625, Kepone)***	Volatiles (624)(Headspace free) (Grab)	Free Cyanide (Interference Check) (Grab)****	Ammonia (~~Comp~~) Grab	TBT (Subcontract)	Dissolved Hex. Cr VI** (24 hour holding time)	Hardness	E. Coli (6 hour holding)(Grab)	T. Rec. Selenium 200.8 (SUB)	Chloride (~~Comp~~) Grab	Hydrogen Sulfide (Grab)	Nonylphenol	pH/Conductivity (Grab)
07402	WW	Outfall 001					5/11/12	1047	~~28~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	X	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	X	~~X~~
							5/11/12	1054	26		X										X		
							5/11/12	1110				X		X			X	X	X	X			X
							5/11/12	1126								X							
							~~5/11/12~~	~~1131~~					~~X~~										
							~~5/11/12~~	~~1140~~		~~X~~													

*WW= Wastewater, GW = Groundwater, DW - Drinking Water, HW - Hazardous Waste, OTHERS

Preservatives:
1 = <6°C
2 = HNO_3
3 = H_2SO_4
4 = NaOH
5 = $Na_2S_2O_3$
6 = $Na_2S_2O_3$ + HCl
7 = NaOH + ZnOAc
8 = H_2SO_4 + EAS
9 = NH_4Cl
10=Ascorbic Acid + HCl
11=HCl
12=Zinc Acetate + NaOH
13=Na_2SO_3 + HCl
14=Na_2SO_3 + H_2SO_4

pH>12 NaOH
pH<2 H_2SO_4
pH<2 HNO_3
pH<2 HNO_3

Sampled By: Robert Joyner Date/Time: 5/11/12 1047 – 1126
Relinquished By: Robert Joyner Date/Time: 5/11/12 1255
Received By: [signature] Date/Time: 5-11-12 @ 1255
Relinquished By: [signature] Date/Time: 5-11-12 14:30
Received By: Mindy Hall Date/Time: 5-11-12 @ 1830

✓ for Compliance Refr in Lab
___ Not for Compliance

*Dissolved Metals Filtration: Date: ~~5/11/12~~ Time: ~~1140~~ Initials ~~RS~~ (A) MH 5/14
*Sb,As,Cd,Cu,Pb,Ni,,Ag **(Method 200.8 - Subcontract)**
Hg, Cr, Cr III, Tl (in house), Zn **concentrate**
24 hour holding time, Dissolved Hex. Cr VI
** Filtration Date: ~~5/11/12~~ Time: ~~1126~~ Initials: ~~RS~~
***With Kepone, Diazinon.

Total Residual Chlorine 0.04 5/11/12 Date/Time ~~1139~~ 5/11/12 1037 Initials RS

****CN Interference Check: Positive Negative
Sulfide: ___ ✓
Oxidizing Agent: ___ ✓

Arrival Temp: 0.3 °C

JAMES R. REED and ASSOCIATES (757) 873-4703; FAX (757) 873-1498
770 Pilot House Drive, Newport News, VA 23606

Attachment E – Effluent Limitations Analysis for the 0.040 MGD and 0.060 MGD Flow Tiers (Including MSTRANTI Data Source Report, Mix.exe, MSTRANTI WLAs and STATS.exe Printouts)

MSTRANTI DATA SOURCE REPORT

Stream Information	
Mean Hardness:	Monitoring Station 5ASTO001.21 Data
90% Temperature (annual):	Monitoring Station 5ASTO001.21 Data
90% Temperature (wet season):	Monitoring Station 5ASTO001.21 Data
90% Maximum pH:	Monitoring Station 5ASTO001.21 Data
10% Maximum pH:	Monitoring Station 5ASTO001.21 Data
Tier Designation:	Tier Determination (2015 Flow Frequency Analysis Memorandum)
Stream Flows	
All flows <u>except</u> Harmonic Mean flow:	Flow Frequency Determination (2015 Flow Frequency Analysis Memorandum)
Harmonic Mean (HM) flow:	Conservative assumption using 30Q5 flow (1.5 MGD) of receiving stream (30Q5 from 2015 Flow Frequency Analysis Memorandum)
Mixing Information	
All Data:	Virginia DEQ Mixing Zone Analysis (Mix.exe)
Effluent Information	
Mean Hardness:	2012 Attachment A Water Quality Criteria Monitoring Form
90% Temperature (annual):	2015 Application – EPA Form 2A
90% Maximum pH:	Monthly DMRs
10% Maximum pH:	Monthly DMRs
Discharge Flow:	Design Capacity (existing 0.040 MGD and proposed 0.060 MGD per 2015 Application)

Data Location:

Monitoring Station 5ASTO001.21 Data - **Attachment C**
2015 Flow Frequency Analysis Memorandum - **Attachment C**
MIX.exe Output - **Attachment E**
All Effluent Data - **Attachment D**

Virginia DEQ Mixing Zone Analysis Version 2.1.0

PLEASE ENTER DATA

Facility Name	Stony Creek WWTF	
Effluent Flow	0.040	MGD
Stream 7Q10	0.28	MGD
Stream 30Q10	0.72	MGD
Stream 1Q10	0.23	MGD
Stream Slope	0.00056	ft/ft
Stream Width	8	ft

Mixing Zone Predictions @ 7Q10			Mixing Zone Predictions @ 30Q10			Mixing Zone Predictions @ 1Q10		
Depth	.3869	ft	Depth	.6664	ft	Depth	.3479	ft
Velocity	.16	ft/sec	Velocity	.2207	ft/sec	Velocity	.1501	ft/sec
Length	126.78	ft	Length	77.34	ft	Length	139.43	ft
Time	.0092	days	Time	.0041	days	Time	.2581	hrs
A Complete mix assumption is appropriate for this situation using 100 percent of the 7Q10			A Complete mix assumption is appropriate for this situation using 100 percent of the 30Q10			A Complete mix assumption is appropriate for this situation using 100 percent of the 1Q10		

Bottom Scale

On a scale of 1 to 5, the bottom ranges from smooth silt to extremely rocky. Click the button that best describes it.

○ 1 ○ 2 ◉ 3 ○ 4 ○ 5

Channel Scale

On a scale of 1 to 3, the channel ranges from uniform to extreme variations in width. Click the choice that best describes it

◉ Normal Stream, moderate curves

○ Smaller stream, more severe curves

○ Extremely irregular channel

Perform calculations

View output text file

Print results

Clear the inputs

Help

EXIT

Virginia DEQ Mixing Zone Analysis Version 2.1.0

PLEASE ENTER DATA

Facility Name	Stony Creek WWTF	
Effluent Flow	0.060	MGD
Stream 7Q10	0.28	MGD
Stream 30Q10	0.72	MGD
Stream 1Q10	0.23	MGD
Stream Slope	0.00056	ft/ft
Stream Width	8	ft

Mixing Zone Predictions @ 7Q10

Depth	.4016	ft
Velocity	.1637	ft/sec
Length	122.65	ft
Time	.0087	days

A Complete mix assumption is appropriate for this situation using 100 percent of the 7Q10

Mixing Zone Predictions @ 30Q10

Depth	.6775	ft
Velocity	.2228	ft/sec
Length	76.16	ft
Time	.004	days

A Complete mix assumption is appropriate for this situation using 100 percent of the 30Q10

Mixing Zone Predictions @ 1Q10

Depth	.3638	ft
Velocity	.1542	ft/sec
Length	133.95	ft
Time	.2413	hrs

A Complete mix assumption is appropriate for this situation using 100 percent of the 1Q10

Bottom Scale

On a scale of 1 to 5, the bottom ranges from smooth silt to extremely rocky. Click the button that best describes it.

○ 1 ○ 2 ◉ 3 ○ 4 ○ 5

Channel Scale

On a scale of 1 to 3, the channel ranges from uniform to extreme variations in width. Click the choice that best describes it

◉ Normal Stream, moderate curves

○ Smaller stream, more severe curves

○ Extremely irregular channel

Perform calculations

View output text file

Print results

Clear the inputs

Help

EXIT

FRESHWATER
WATER QUALITY CRITERIA / WASTELOAD ALLOCATION ANALYSIS

Facility Name: Stony Creek WWTF (0.040MGD) Permit No.: VA0062669

Receiving Stream: Stony Creek Version: OWP Guidance Memo 00-2011 (8/24/00)

Stream Information		
Mean Hardness (as CaCO3) =	24	mg/L
90% Temperature (Annual) =	25.1	deg C
90% Temperature (Wet season) =	NA	deg C
90% Maximum pH =	7.1	SU
10% Maximum pH =	6	SU
Tier Designation (1 or 2) =	1	
Public Water Supply (PWS) Y/N? =	N	
Trout Present Y/N? =	N	
Early Life Stages Present Y/N? =	Y	

Stream Flows		
1Q10 (Annual) =	0.23	MGD
7Q10 (Annual) =	0.28	MGD
30Q10 (Annual) =	0.72	MGD
1Q10 (Wet season) =	15	MGD
30Q10 (Wet season)	35	MGD
30Q5 =	1.5	MGD
Harmonic Mean =	1.5	MGD

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

Effluent Information		
Mean Hardness (as CaCO3) =	47.3	mg/L
90% Temp (Annual) =	28.3	deg C
90% Temp (Wet season) =	NA	deg C
90% Maximum pH =	8.16	SU
10% Maximum pH =	7.69	SU
Discharge Flow =	0.04	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	3.8E+04	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**3.8E+04**
Acrolein	0	--	--	na	9.3E+00	--	--	na	3.6E+02	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**3.6E+02**
Acrylonitrile[C]	0	--	--	na	2.5E+00	--	--	na	9.6E+01	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**9.6E+01**
Aldrin [C]	0	3.0E+00	--	na	5.0E-04	2.0E+01	--	na	1.9E-02	--	--	--	--	--	--	--	--	**2.0E+01**	**--**	**na**	**1.9E-02**
Ammonia-N (mg/l) (Yearly)	0	3.08E+01	2.81E+00	na	--	2.08E+02	5.33E+01	na	--	--	--	--	--	--	--	--	--	**2.08E+02**	**5.33E+01**	**na**	**--**
Ammonia-N (mg/l) (High Flow)	0	6.19E+00	#VALUE!	na	--	6.19E+00	#VALUE!	na	--	--	--	--	--	--	--	--	--	**6.19E+00**	**#VALUE!**	**na**	**--**
Anthracene	0	--	--	na	4.0E+04	--	--	na	1.5E+06	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**1.5E+06**
Antimony	0	--	--	na	6.4E+02	--	--	na	2.5E+04	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**2.5E+04**
Arsenic	0	3.4E+02	1.5E+02	na	--	2.3E+03	1.2E+03	na	--	--	--	--	--	--	--	--	--	**2.3E+03**	**1.2E+03**	**na**	**--**
Barium	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**--**
Benzene [C]	0	--	--	na	5.1E+02	--	--	na	2.0E+04	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**2.0E+04**
Benzidine[C]	0	--	--	na	2.0E-03	--	--	na	7.7E-02	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**7.7E-02**
Benzo (a) anthracene [C]	0	--	--	na	1.8E-01	--	--	na	6.9E+00	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**6.9E+00**
Benzo (b) fluoranthene [C]	0	--	--	na	1.8E-01	--	--	na	6.9E+00	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**6.9E+00**
Benzo (k) fluoranthene [C]	0	--	--	na	1.8E-01	--	--	na	6.9E+00	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**6.9E+00**
Benzo (a) pyrene [C]	0	--	--	na	1.8E-01	--	--	na	6.9E+00	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**6.9E+00**
Bis2-Chloroethyl Ether [C]	0	--	--	na	5.3E+00	--	--	na	2.0E+02	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**2.0E+02**
Bis2-Chloroisopropyl Ether	0	--	--	na	6.5E+04	--	--	na	2.5E+06	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**2.5E+06**
Bis 2-Ethylhexyl Phthalate [C]	0	--	--	na	2.2E+01	--	--	na	8.5E+02	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**8.5E+02**
Bromoform [C]	0	--	--	na	1.4E+03	--	--	na	5.4E+04	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**5.4E+04**
Butylbenzylphthalate	0	--	--	na	1.9E+03	--	--	na	7.3E+04	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**7.3E+04**
Cadmium	0	9.1E-01	4.0E-01	na	--	6.2E+00	3.2E+00	na	--	--	--	--	--	--	--	--	--	**6.2E+00**	**3.2E+00**	**na**	**--**
Carbon Tetrachloride [C]	0	--	--	na	1.6E+01	--	--	na	6.2E+02	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**6.2E+02**
Chlordane [C]	0	2.4E+00	4.3E-03	na	8.1E-03	1.6E+01	3.4E-02	na	3.1E-01	--	--	--	--	--	--	--	--	**1.6E+01**	**3.4E-02**	**na**	**3.1E-01**
Chloride	0	8.6E+05	2.3E+05	na	--	5.8E+06	1.8E+06	na	--	--	--	--	--	--	--	--	--	**5.8E+06**	**1.8E+06**	**na**	**--**
TRC	0	1.9E+01	1.1E+01	na	--	1.3E+02	8.8E+01	na	--	--	--	--	--	--	--	--	--	**1.3E+02**	**8.8E+01**	**na**	**--**
Chlorobenzene	0	--	--	na	1.6E+03	--	--	na	6.2E+04	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**6.2E+04**

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				**Most Limiting Allocations**			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	**Acute**	**Chronic**	**HH (PWS)**	**HH**
Chlorodibromomethane[C]	0	--	--	na	1.3E+02	--	--	na	5.0E+03	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**5.0E+03**
Chloroform	0	--	--	na	1.1E+04	--	--	na	4.2E+05	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**4.2E+05**
2-Chloronaphthalene	0	--	--	na	1.6E+03	--	--	na	6.2E+04	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**6.2E+04**
2-Chlorophenol	0	--	--	na	1.5E+02	--	--	na	5.8E+03	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**5.8E+03**
Chlorpyrifos	0	8.3E-02	4.1E-02	na	--	5.6E-01	3.3E-01	na	--	--	--	--	--	--	--	--	--	**5.6E-01**	**3.3E-01**	**na**	**--**
Chromium III	0	2.0E+02	2.5E+01	na	--	1.3E+03	2.0E+02	na	--	--	--	--	--	--	--	--	--	**1.3E+03**	**2.0E+02**	**na**	**--**
Chromium VI	0	1.6E+01	1.1E+01	na	--	1.1E+02	8.8E+01	na	--	--	--	--	--	--	--	--	--	**1.1E+02**	**8.8E+01**	**na**	**--**
Chromium, Total	0	--	--	1.0E+02	--	--	--	na	--	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**--**
Chrysene [C]	0	--	--	na	1.8E-02	--	--	na	6.9E-01	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**6.9E-01**
Copper	0	4.0E+00	2.9E+00	na	--	2.7E+01	2.3E+01	na	--	--	--	--	--	--	--	--	--	**2.7E+01**	**2.3E+01**	**na**	**--**
Cyanide, Free	0	2.2E+01	5.2E+00	na	1.6E+04	1.5E+02	4.2E+01	na	6.2E+05	--	--	--	--	--	--	--	--	**1.5E+02**	**4.2E+01**	**na**	**6.2E+05**
DDD [C]	0	--	--	na	3.1E-03	--	--	na	1.2E-01	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**1.2E-01**
DDE [C]	0	--	--	na	2.2E-03	--	--	na	8.5E-02	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**8.5E-02**
DDT [C]	0	1.1E+00	1.0E-03	na	2.2E-03	7.4E+00	8.0E-03	na	8.5E-02	--	--	--	--	--	--	--	--	**7.4E+00**	**8.0E-03**	**na**	**8.5E-02**
Demeton	0	--	1.0E-01	na	--	--	8.0E-01	na	--	--	--	--	--	--	--	--	--	**--**	**8.0E-01**	**na**	**--**
Diazinon	0	1.7E-01	1.7E-01	na	--	1.1E+00	1.4E+00	na	--	--	--	--	--	--	--	--	--	**1.1E+00**	**1.4E+00**	**na**	**--**
Dibenz(a,h)anthracene [C]	0	--	--	na	1.8E-01	--	--	na	6.9E+00	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**6.9E+00**
1,2-Dichlorobenzene	0	--	--	na	1.3E+03	--	--	na	5.0E+04	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**5.0E+04**
1,3-Dichlorobenzene	0	--	--	na	9.6E+02	--	--	na	3.7E+04	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**3.7E+04**
1,4-Dichlorobenzene	0	--	--	na	1.9E+02	--	--	na	7.3E+03	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**7.3E+03**
3,3-Dichlorobenzidine[C]	0	--	--	na	2.8E-01	--	--	na	1.1E+01	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**1.1E+01**
Dichlorobromomethane [C]	0	--	--	na	1.7E+02	--	--	na	6.5E+03	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**6.5E+03**
1,2-Dichloroethane [C]	0	--	--	na	3.7E+02	--	--	na	1.4E+04	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**1.4E+04**
1,1-Dichloroethylene	0	--	--	na	7.1E+03	--	--	na	2.7E+05	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**2.7E+05**
1,2-trans-dichloroethylene	0	--	--	na	1.0E+04	--	--	na	3.9E+05	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**3.9E+05**
2,4-Dichlorophenol	0	--	--	na	2.9E+02	--	--	na	1.1E+04	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**1.1E+04**
2,4-Dichlorophenoxy acetic acid (2,4-D)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**--**
1,2-Dichloropropane[C]	0	--	--	na	1.5E+02	--	--	na	5.8E+03	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**5.8E+03**
1,3-Dichloropropene [C]	0	--	--	na	2.1E+02	--	--	na	8.1E+03	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**8.1E+03**
Dieldrin [C]	0	2.4E-01	5.6E-02	na	5.4E-04	1.6E+00	4.5E-01	na	2.1E-02	--	--	--	--	--	--	--	--	**1.6E+00**	**4.5E-01**	**na**	**2.1E-02**
Diethyl Phthalate	0	--	--	na	4.4E+04	--	--	na	1.7E+06	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**1.7E+06**
2,4-Dimethylphenol	0	--	--	na	8.5E+02	--	--	na	3.3E+04	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**3.3E+04**
Dimethyl Phthalate	0	--	--	na	1.1E+06	--	--	na	4.2E+07	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**4.2E+07**
Di-n-Butyl Phthalate	0	--	--	na	4.5E+03	--	--	na	1.7E+05	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**1.7E+05**
2,4 Dinitrophenol	0	--	--	na	5.3E+03	--	--	na	2.0E+05	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**2.0E+05**
2-Methyl-4,6-Dinitrophenol	0	--	--	na	2.8E+02	--	--	na	1.1E+04	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**1.1E+04**
2,4-Dinitrotoluene [C]	0	--	--	na	3.4E+01	--	--	na	1.3E+03	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**1.3E+03**
Dioxin 2,3,7,8-tetrachlorodibenzo-p-dioxin	0	--	--	na	5.1E-08	--	--	na	2.0E-06	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**2.0E-06**
1,2-Diphenylhydrazine[C]	0	--	--	na	2.0E+00	--	--	na	7.7E+01	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**7.7E+01**
Alpha-Endosulfan	0	2.2E-01	5.6E-02	na	8.9E+01	1.5E+00	4.5E-01	na	3.4E+03	--	--	--	--	--	--	--	--	**1.5E+00**	**4.5E-01**	**na**	**3.4E+03**
Beta-Endosulfan	0	2.2E-01	5.6E-02	na	8.9E+01	1.5E+00	4.5E-01	na	3.4E+03	--	--	--	--	--	--	--	--	**1.5E+00**	**4.5E-01**	**na**	**3.4E+03**
Alpha + Beta Endosulfan	0	2.2E-01	5.6E-02	--	--	1.5E+00	4.5E-01	--	--	--	--	--	--	--	--	--	--	**1.5E+00**	**4.5E-01**	**--**	**--**
Endosulfan Sulfate	0	--	--	na	8.9E+01	--	--	na	3.4E+03	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**3.4E+03**
Endrin	0	8.6E-02	3.6E-02	na	6.0E-02	5.8E-01	2.9E-01	na	2.3E+00	--	--	--	--	--	--	--	--	**5.8E-01**	**2.9E-01**	**na**	**2.3E+00**
Endrin Aldehyde	0	--	--	na	3.0E-01	--	--	na	1.2E+01	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**1.2E+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	8.1E+04	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**8.1E+04**
Fluoranthene	0	--	--	na	1.4E+02	--	--	na	5.4E+03	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**5.4E+03**
Fluorene	0	--	--	na	5.3E+03	--	--	na	2.0E+05	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**2.0E+05**
Foaming Agents	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**--**
Guthion	0	--	1.0E-02	na	--	--	8.0E-02	na	--	--	--	--	--	--	--	--	--	**--**	**8.0E-02**	**na**	**--**
Heptachlor [C]	0	5.2E-01	3.8E-03	na	7.9E-04	3.5E+00	3.0E-02	na	3.0E-02	--	--	--	--	--	--	--	--	**3.5E+00**	**3.0E-02**	**na**	**3.0E-02**
Heptachlor Epoxide[C]	0	5.2E-01	3.8E-03	na	3.9E-04	3.5E+00	3.0E-02	na	1.5E-02	--	--	--	--	--	--	--	--	**3.5E+00**	**3.0E-02**	**na**	**1.5E-02**
Hexachlorobenzene[C]	0	--	--	na	2.9E-03	--	--	na	1.1E-01	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**1.1E-01**
Hexachlorobutadiene[C]	0	--	--	na	1.8E+02	--	--	na	6.9E+03	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**6.9E+03**
Hexachlorocyclohexane Alpha-BHC[C]	0	--	--	na	4.9E-02	--	--	na	1.9E+00	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**1.9E+00**
Hexachlorocyclohexane Beta-BHC[C]	0	--	--	na	1.7E-01	--	--	na	6.5E+00	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**6.5E+00**
Hexachlorocyclohexane Gamma-BHC[C] (Lindane)	0	9.5E-01	na	na	1.8E+00	6.4E+00	--	na	6.9E+01	--	--	--	--	--	--	--	--	**6.4E+00**	**--**	**na**	**6.9E+01**
Hexachlorocyclopentadiene	0	--	--	na	1.1E+03	--	--	na	4.2E+04	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**4.2E+04**
Hexachloroethane[C]	0	--	--	na	3.3E+01	--	--	na	1.3E+03	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**1.3E+03**
Hydrogen Sulfide	0	--	2.0E+00	na	--	--	1.6E+01	na	--	--	--	--	--	--	--	--	--	**--**	**1.6E+01**	**na**	**--**
Indeno (1,2,3-cd) pyrene [C]	0	--	--	na	1.8E-01	--	--	na	6.9E+00	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**6.9E+00**
Iron	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**--**
Isophorone[C]	0	--	--	na	9.6E+03	--	--	na	3.7E+05	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**3.7E+05**
Kepone	0	--	0.0E+00	na	--	--	0.0E+00	na	--	--	--	--	--	--	--	--	--	**--**	**0.0E+00**	**na**	**--**
Lead	0	2.3E+01	2.5E+00	na	--	1.5E+02	2.0E+01	na	--	--	--	--	--	--	--	--	--	**1.5E+02**	**2.0E+01**	**na**	**--**
Malathion	0	--	1.0E-01	na	--	--	8.0E-01	na	--	--	--	--	--	--	--	--	--	**--**	**8.0E-01**	**na**	**--**
Manganese	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**--**
Mercury	0	1.4E+00	7.7E-01	- -	- -	9.5E+00	6.2E+00	- -	- -	--	--	--	--	--	--	--	--	**9.5E+00**	**6.2E+00**	**- -**	**- -**
Methyl Bromide	0	--	--	na	1.5E+03	--	--	na	5.8E+04	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**5.8E+04**
Methylene Chloride [C]	0	--	--	na	5.9E+03	--	--	na	2.3E+05	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**2.3E+05**
Methoxychlor	0	--	3.0E-02	na	--	--	2.4E-01	na	--	--	--	--	--	--	--	--	--	**--**	**2.4E-01**	**na**	**--**
Mirex	0	--	0.0E+00	na	--	--	0.0E+00	na	--	--	--	--	--	--	--	--	--	**--**	**0.0E+00**	**na**	**--**
Nickel	0	6.1E+01	6.7E+00	na	4.6E+03	4.1E+02	5.3E+01	na	1.8E+05	--	--	--	--	--	--	--	--	**4.1E+02**	**5.3E+01**	**na**	**1.8E+05**
Nitrate (as N)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**--**
Nitrobenzene	0	--	--	na	6.9E+02	--	--	na	2.7E+04	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**2.7E+04**
N-Nitrosodimethylamine[C]	0	--	--	na	3.0E+01	--	--	na	1.2E+03	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**1.2E+03**
N-Nitrosodiphenylamine[C]	0	--	--	na	6.0E+01	--	--	na	2.3E+03	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**2.3E+03**
N-Nitrosodi-n-propylamine[C]	0	--	--	na	5.1E+00	--	--	na	2.0E+02	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**2.0E+02**
Nonylphenol	0	2.8E+01	6.6E+00	--	--	1.9E+02	5.3E+01	na	--	--	--	--	--	--	--	--	--	**1.9E+02**	**5.3E+01**	**na**	**--**
Parathion	0	6.5E-02	1.3E-02	na	--	4.4E-01	1.0E-01	na	--	--	--	--	--	--	--	--	--	**4.4E-01**	**1.0E-01**	**na**	**--**
PCB Total[C]	0	--	1.4E-02	na	6.4E-04	--	1.1E-01	na	2.5E-02	--	--	--	--	--	--	--	--	**--**	**1.1E-01**	**na**	**2.5E-02**
Pentachlorophenol [C]	0	3.4E+00	2.6E+00	na	3.0E+01	2.3E+01	2.1E+01	na	1.2E+03	--	--	--	--	--	--	--	--	**2.3E+01**	**2.1E+01**	**na**	**1.2E+03**
Phenol	0	--	--	na	8.6E+05	--	--	na	3.3E+07	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**3.3E+07**
Pyrene	0	--	--	na	4.0E+03	--	--	na	1.5E+05	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**1.5E+05**
Radionuclides	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**--**
Gross Alpha Activity (pCi/L)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**--**
Beta and Photon Activity (mrem/yr)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**--**
Radium 226 + 228 (pCi/L)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**--**
Uranium (ug/l)	0	--	--	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	1.4E+02	4.0E+01	na	1.6E+05	--	--	--	--	--	--	--	--	**1.4E+02**	**4.0E+01**	**na**	**1.6E+05**
Silver	0	3.7E-01	--	na	--	2.5E+00	--	na	--	--	--	--	--	--	--	--	--	**2.5E+00**	**--**	**na**	**--**
Sulfate	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**--**
1,1,2,2-Tetrachloroethane[C]	0	--	--	na	4.0E+01	--	--	na	1.5E+03	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**1.5E+03**
Tetrachloroethylene[C]	0	--	--	na	3.3E+01	--	--	na	1.3E+03	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**1.3E+03**
Thallium	0	--	--	na	4.7E-01	--	--	na	1.8E+01	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**1.8E+01**
Toluene	0	--	--	na	6.0E+03	--	--	na	2.3E+05	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**2.3E+05**
Total dissolved solids	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**--**
Toxaphene [C]	0	7.3E-01	2.0E-04	na	2.8E-03	4.9E+00	1.6E-03	na	1.1E-01	--	--	--	--	--	--	--	--	**4.9E+00**	**1.6E-03**	**na**	**1.1E-01**
Tributyltin	0	4.6E-01	7.2E-02	na	--	3.1E+00	5.8E-01	na	--	--	--	--	--	--	--	--	--	**3.1E+00**	**5.8E-01**	**na**	**--**
1,2,4-Trichlorobenzene	0	--	--	na	7.0E+01	--	--	na	2.7E+03	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**2.7E+03**
1,1,2-Trichloroethane[C]	0	--	--	na	1.6E+02	--	--	na	6.2E+03	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**6.2E+03**
Trichloroethylene [C]	0	--	--	na	3.0E+02	--	--	na	1.2E+04	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**1.2E+04**
2,4,6-Trichlorophenol [C]	0	--	--	na	2.4E+01	--	--	na	9.2E+02	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**9.2E+02**
2-(2,4,5-Trichlorophenoxy) propionic acid (Silvex)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**--**
Vinyl Chloride[C]	0	--	--	na	2.4E+01	--	--	na	9.2E+02	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**9.2E+02**
Zinc	0	3.9E+01	3.9E+01	na	2.6E+04	2.6E+02	3.1E+02	na	1.0E+06	--	--	--	--	--	--	--	--	**2.6E+02**	**3.1E+02**	**na**	**1.0E+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	2.5E+04
Arsenic	7.2E+02
Barium	na
Cadmium	1.9E+00
Chromium III	1.2E+02
Chromium VI	4.3E+01
Copper	1.1E+01
Iron	na
Lead	1.2E+01
Manganese	na
Mercury	3.7E+00
Nickel	3.2E+01
Selenium	2.4E+01
Silver	1.0E+00
Zinc	1.1E+02

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

FRESHWATER
WATER QUALITY CRITERIA / WASTELOAD ALLOCATION ANALYSIS

Facility Name: Stony Creek WWTF (0.040MGD) Permit No.: VA0062669

Receiving Stream: Stony Creek Version: OWP Guidance Memo 00-2011 (8/24/00)

Stream Information		
Mean Hardness (as CaCO3) =	24	mg/L
90% Temperature (Annual) =	25.1	deg C
90% Temperature (Wet season) =	NA	deg C
90% Maximum pH =	7.1	SU
10% Maximum pH =	6	SU
Tier Designation (1 or 2) =	1	
Public Water Supply (PWS) Y/N? =	N	
Trout Present Y/N? =	N	
Early Life Stages Present Y/N? =	Y	

Stream Flows		
1Q10 (Annual) =	0.23	MGD
7Q10 (Annual) =	0.28	MGD
30Q10 (Annual) =	0.72	MGD
1Q10 (Wet season) =	15	MGD
30Q10 (Wet season)	35	MGD
30Q5 =	1.5	MGD
Harmonic Mean =	1.5	MGD

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

Effluent Information		
Mean Hardness (as CaCO3) =	47.3	mg/L
90% Temp (Annual) =	28.3	deg C
90% Temp (Wet season) =	NA	deg C
90% Maximum pH =	8.16	SU
10% Maximum pH =	7.69	SU
Discharge Flow =	0.06	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	2.6E+04	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**2.6E+04**
Acrolein	0	--	--	na	9.3E+00	--	--	na	2.4E+02	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**2.4E+02**
Acrylonitrile[C]	0	--	--	na	2.5E+00	--	--	na	6.5E+01	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**6.5E+01**
Aldrin [C]	0	3.0E+00	--	na	5.0E-04	1.5E+01	--	na	1.3E-02	--	--	--	--	--	--	--	--	**1.5E+01**	**--**	**na**	**1.3E-02**
Ammonia-N (mg/l) (Yearly)	0	2.98E+01	2.78E+00	na	--	1.44E+02	3.61E+01	na	--	--	--	--	--	--	--	--	--	**1.44E+02**	**3.61E+01**	**na**	**--**
Ammonia-N (mg/l) (High Flow)	0	6.19E+00	#VALUE!	na	--	6.19E+00	#VALUE!	na	--	--	--	--	--	--	--	--	--	**6.19E+00**	**#VALUE!**	**na**	**--**
Anthracene	0	--	--	na	4.0E+04	--	--	na	1.0E+06	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**1.0E+06**
Antimony	0	--	--	na	6.4E+02	--	--	na	1.7E+04	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**1.7E+04**
Arsenic	0	3.4E+02	1.5E+02	na	--	1.6E+03	8.5E+02	na	--	--	--	--	--	--	--	--	--	**1.6E+03**	**8.5E+02**	**na**	**--**
Barium	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**--**
Benzene [C]	0	--	--	na	5.1E+02	--	--	na	1.3E+04	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**1.3E+04**
Benzidine[C]	0	--	--	na	2.0E-03	--	--	na	5.2E-02	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**5.2E-02**
Benzo (a) anthracene [C]	0	--	--	na	1.8E-01	--	--	na	4.7E+00	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**4.7E+00**
Benzo (b) fluoranthene [C]	0	--	--	na	1.8E-01	--	--	na	4.7E+00	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**4.7E+00**
Benzo (k) fluoranthene [C]	0	--	--	na	1.8E-01	--	--	na	4.7E+00	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**4.7E+00**
Benzo (a) pyrene [C]	0	--	--	na	1.8E-01	--	--	na	4.7E+00	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**4.7E+00**
Bis2-Chloroethyl Ether [C]	0	--	--	na	5.3E+00	--	--	na	1.4E+02	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**1.4E+02**
Bis2-Chloroisopropyl Ether	0	--	--	na	6.5E+04	--	--	na	1.7E+06	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**1.7E+06**
Bis 2-Ethylhexyl Phthalate [C]	0	--	--	na	2.2E+01	--	--	na	5.7E+02	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**5.7E+02**
Bromoform [C]	0	--	--	na	1.4E+03	--	--	na	3.6E+04	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**3.6E+04**
Butylbenzylphthalate	0	--	--	na	1.9E+03	--	--	na	4.9E+04	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**4.9E+04**
Cadmium	0	9.6E-01	4.2E-01	na	--	4.7E+00	2.4E+00	na	--	--	--	--	--	--	--	--	--	**4.7E+00**	**2.4E+00**	**na**	**--**
Carbon Tetrachloride [C]	0	--	--	na	1.6E+01	--	--	na	4.2E+02	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**4.2E+02**
Chlordane [C]	0	2.4E+00	4.3E-03	na	8.1E-03	1.2E+01	2.4E-02	na	2.1E-01	--	--	--	--	--	--	--	--	**1.2E+01**	**2.4E-02**	**na**	**2.1E-01**
Chloride	0	8.6E+05	2.3E+05	na	--	4.2E+06	1.3E+06	na	--	--	--	--	--	--	--	--	--	**4.2E+06**	**1.3E+06**	**na**	**--**
TRC	0	1.9E+01	1.1E+01	na	--	9.2E+01	6.2E+01	na	--	--	--	--	--	--	--	--	--	**9.2E+01**	**6.2E+01**	**na**	**--**
Chlorobenzene	0	--	--	na	1.6E+03	--	--	na	4.2E+04	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**4.2E+04**

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				**Most Limiting Allocations**			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	**Acute**	**Chronic**	**HH (PWS)**	**HH**
Chlorodibromomethane[C]	0	--	--	na	1.3E+02	--	--	na	3.4E+03	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**3.4E+03**
Chloroform	0	--	--	na	1.1E+04	--	--	na	2.9E+05	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**2.9E+05**
2-Chloronaphthalene	0	--	--	na	1.6E+03	--	--	na	4.2E+04	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**4.2E+04**
2-Chlorophenol	0	--	--	na	1.5E+02	--	--	na	3.9E+03	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**3.9E+03**
Chlorpyrifos	0	8.3E-02	4.1E-02	na	--	4.0E-01	2.3E-01	na	--	--	--	--	--	--	--	--	--	**4.0E-01**	**2.3E-01**	**na**	**--**
Chromium III	0	2.1E+02	2.6E+01	na	--	9.9E+02	1.5E+02	na	--	--	--	--	--	--	--	--	--	**9.9E+02**	**1.5E+02**	**na**	**--**
Chromium VI	0	1.6E+01	1.1E+01	na	--	7.7E+01	6.2E+01	na	--	--	--	--	--	--	--	--	--	**7.7E+01**	**6.2E+01**	**na**	**--**
Chromium, Total	0	--	--	1.0E+02	--	--	--	na	--	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**--**
Chrysene [C]	0	--	--	na	1.8E-02	--	--	na	4.7E-01	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**4.7E-01**
Copper	0	4.2E+00	3.0E+00	na	--	2.0E+01	1.7E+01	na	--	--	--	--	--	--	--	--	--	**2.0E+01**	**1.7E+01**	**na**	**--**
Cyanide, Free	0	2.2E+01	5.2E+00	na	1.6E+04	1.1E+02	2.9E+01	na	4.2E+05	--	--	--	--	--	--	--	--	**1.1E+02**	**2.9E+01**	**na**	**4.2E+05**
DDD [C]	0	--	--	na	3.1E-03	--	--	na	8.1E-02	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**8.1E-02**
DDE [C]	0	--	--	na	2.2E-03	--	--	na	5.7E-02	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**5.7E-02**
DDT [C]	0	1.1E+00	1.0E-03	na	2.2E-03	5.3E+00	5.7E-03	na	5.7E-02	--	--	--	--	--	--	--	--	**5.3E+00**	**5.7E-03**	**na**	**5.7E-02**
Demeton	0	--	1.0E-01	na	--	--	5.7E-01	na	--	--	--	--	--	--	--	--	--	**--**	**5.7E-01**	**na**	**--**
Diazinon	0	1.7E-01	1.7E-01	na	--	8.2E-01	9.6E-01	na	--	--	--	--	--	--	--	--	--	**8.2E-01**	**9.6E-01**	**na**	**--**
Dibenz(a,h)anthracene [C]	0	--	--	na	1.8E-01	--	--	na	4.7E+00	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**4.7E+00**
1,2-Dichlorobenzene	0	--	--	na	1.3E+03	--	--	na	3.4E+04	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**3.4E+04**
1,3-Dichlorobenzene	0	--	--	na	9.6E+02	--	--	na	2.5E+04	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**2.5E+04**
1,4-Dichlorobenzene	0	--	--	na	1.9E+02	--	--	na	4.9E+03	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**4.9E+03**
3,3-Dichlorobenzidine[C]	0	--	--	na	2.8E-01	--	--	na	7.3E+00	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**7.3E+00**
Dichlorobromomethane [C]	0	--	--	na	1.7E+02	--	--	na	4.4E+03	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**4.4E+03**
1,2-Dichloroethane [C]	0	--	--	na	3.7E+02	--	--	na	9.6E+03	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**9.6E+03**
1,1-Dichloroethylene	0	--	--	na	7.1E+03	--	--	na	1.8E+05	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**1.8E+05**
1,2-trans-dichloroethylene	0	--	--	na	1.0E+04	--	--	na	2.6E+05	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**2.6E+05**
2,4-Dichlorophenol	0	--	--	na	2.9E+02	--	--	na	7.5E+03	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**7.5E+03**
2,4-Dichlorophenoxy acetic acid (2,4-D)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**--**
1,2-Dichloropropane[C]	0	--	--	na	1.5E+02	--	--	na	3.9E+03	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**3.9E+03**
1,3-Dichloropropene [C]	0	--	--	na	2.1E+02	--	--	na	5.5E+03	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**5.5E+03**
Dieldrin [C]	0	2.4E-01	5.6E-02	na	5.4E-04	1.2E+00	3.2E-01	na	1.4E-02	--	--	--	--	--	--	--	--	**1.2E+00**	**3.2E-01**	**na**	**1.4E-02**
Diethyl Phthalate	0	--	--	na	4.4E+04	--	--	na	1.1E+06	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**1.1E+06**
2,4-Dimethylphenol	0	--	--	na	8.5E+02	--	--	na	2.2E+04	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**2.2E+04**
Dimethyl Phthalate	0	--	--	na	1.1E+06	--	--	na	2.9E+07	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**2.9E+07**
Di-n-Butyl Phthalate	0	--	--	na	4.5E+03	--	--	na	1.2E+05	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**1.2E+05**
2,4 Dinitrophenol	0	--	--	na	5.3E+03	--	--	na	1.4E+05	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**1.4E+05**
2-Methyl-4,6-Dinitrophenol	0	--	--	na	2.8E+02	--	--	na	7.3E+03	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**7.3E+03**
2,4-Dinitrotoluene [C]	0	--	--	na	3.4E+01	--	--	na	8.8E+02	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**8.8E+02**
Dioxin 2,3,7,8-tetrachlorodibenzo-p-dioxin	0	--	--	na	5.1E-08	--	--	na	1.3E-06	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**1.3E-06**
1,2-Diphenylhydrazine[C]	0	--	--	na	2.0E+00	--	--	na	5.2E+01	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**5.2E+01**
Alpha-Endosulfan	0	2.2E-01	5.6E-02	na	8.9E+01	1.1E+00	3.2E-01	na	2.3E+03	--	--	--	--	--	--	--	--	**1.1E+00**	**3.2E-01**	**na**	**2.3E+03**
Beta-Endosulfan	0	2.2E-01	5.6E-02	na	8.9E+01	1.1E+00	3.2E-01	na	2.3E+03	--	--	--	--	--	--	--	--	**1.1E+00**	**3.2E-01**	**na**	**2.3E+03**
Alpha + Beta Endosulfan	0	2.2E-01	5.6E-02	--	--	1.1E+00	3.2E-01	--	--	--	--	--	--	--	--	--	--	**1.1E+00**	**3.2E-01**	**--**	**--**
Endosulfan Sulfate	0	--	--	na	8.9E+01	--	--	na	2.3E+03	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**2.3E+03**
Endrin	0	8.6E-02	3.6E-02	na	6.0E-02	4.2E-01	2.0E-01	na	1.6E+00	--	--	--	--	--	--	--	--	**4.2E-01**	**2.0E-01**	**na**	**1.6E+00**
Endrin Aldehyde	0	--	--	na	3.0E-01	--	--	na	7.8E+00	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**7.8E+00**

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				**Most Limiting Allocations**			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	**Acute**	**Chronic**	**HH (PWS)**	**HH**
Ethylbenzene	0	--	--	na	2.1E+03	--	--	na	5.5E+04	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**5.5E+04**
Fluoranthene	0	--	--	na	1.4E+02	--	--	na	3.6E+03	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**3.6E+03**
Fluorene	0	--	--	na	5.3E+03	--	--	na	1.4E+05	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**1.4E+05**
Foaming Agents	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**--**
Guthion	0	--	1.0E-02	na	--	--	5.7E-02	na	--	--	--	--	--	--	--	--	--	**--**	**5.7E-02**	**na**	**--**
Heptachlor [C]	0	5.2E-01	3.8E-03	na	7.9E-04	2.5E+00	2.2E-02	na	2.1E-02	--	--	--	--	--	--	--	--	**2.5E+00**	**2.2E-02**	**na**	**2.1E-02**
Heptachlor Epoxide[C]	0	5.2E-01	3.8E-03	na	3.9E-04	2.5E+00	2.2E-02	na	1.0E-02	--	--	--	--	--	--	--	--	**2.5E+00**	**2.2E-02**	**na**	**1.0E-02**
Hexachlorobenzene[C]	0	--	--	na	2.9E-03	--	--	na	7.5E-02	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**7.5E-02**
Hexachlorobutadiene[C]	0	--	--	na	1.8E+02	--	--	na	4.7E+03	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**4.7E+03**
Hexachlorocyclohexane Alpha-BHC[C]	0	--	--	na	4.9E-02	--	--	na	1.3E+00	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**1.3E+00**
Hexachlorocyclohexane Beta-BHC[C]	0	--	--	na	1.7E-01	--	--	na	4.4E+00	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**4.4E+00**
Hexachlorocyclohexane Gamma-BHC[C] (Lindane)	0	9.5E-01	na	na	1.8E+00	4.6E+00	--	na	4.7E+01	--	--	--	--	--	--	--	--	**4.6E+00**	**--**	**na**	**4.7E+01**
Hexachlorocyclopentadiene	0	--	--	na	1.1E+03	--	--	na	2.9E+04	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**2.9E+04**
Hexachloroethane[C]	0	--	--	na	3.3E+01	--	--	na	8.6E+02	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**8.6E+02**
Hydrogen Sulfide	0	--	2.0E+00	na	--	--	1.1E+01	na	--	--	--	--	--	--	--	--	--	**--**	**1.1E+01**	**na**	**--**
Indeno (1,2,3-cd) pyrene [C]	0	--	--	na	1.8E-01	--	--	na	4.7E+00	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**4.7E+00**
Iron	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**--**
Isophorone[C]	0	--	--	na	9.6E+03	--	--	na	2.5E+05	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**2.5E+05**
Kepone	0	--	0.0E+00	na	--	--	0.0E+00	na	--	--	--	--	--	--	--	--	--	**--**	**0.0E+00**	**na**	**--**
Lead	0	2.4E+01	2.7E+00	na	--	1.2E+02	1.5E+01	na	--	--	--	--	--	--	--	--	--	**1.2E+02**	**1.5E+01**	**na**	**--**
Malathion	0	--	1.0E-01	na	--	--	5.7E-01	na	--	--	--	--	--	--	--	--	--	**--**	**5.7E-01**	**na**	**--**
Manganese	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**--**
Mercury	0	1.4E+00	7.7E-01	- -	- -	6.8E+00	4.4E+00	- -	- -	--	--	--	--	--	--	--	--	**6.8E+00**	**4.4E+00**	**- -**	**- -**
Methyl Bromide	0	--	--	na	1.5E+03	--	--	na	3.9E+04	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**3.9E+04**
Methylene Chloride [C]	0	--	--	na	5.9E+03	--	--	na	1.5E+05	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**1.5E+05**
Methoxychlor	0	--	3.0E-02	na	--	--	1.7E-01	na	--	--	--	--	--	--	--	--	--	**--**	**1.7E-01**	**na**	**--**
Mirex	0	--	0.0E+00	na	--	--	0.0E+00	na	--	--	--	--	--	--	--	--	--	**--**	**0.0E+00**	**na**	**--**
Nickel	0	6.4E+01	6.9E+00	na	4.6E+03	3.1E+02	3.9E+01	na	1.2E+05	--	--	--	--	--	--	--	--	**3.1E+02**	**3.9E+01**	**na**	**1.2E+05**
Nitrate (as N)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**--**
Nitrobenzene	0	--	--	na	6.9E+02	--	--	na	1.8E+04	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**1.8E+04**
N-Nitrosodimethylamine[C]	0	--	--	na	3.0E+01	--	--	na	7.8E+02	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**7.8E+02**
N-Nitrosodiphenylamine[C]	0	--	--	na	6.0E+01	--	--	na	1.6E+03	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**1.6E+03**
N-Nitrosodi-n-propylamine[C]	0	--	--	na	5.1E+00	--	--	na	1.3E+02	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**1.3E+02**
Nonylphenol	0	2.8E+01	6.6E+00	--	--	1.4E+02	3.7E+01	na	--	--	--	--	--	--	--	--	--	**1.4E+02**	**3.7E+01**	**na**	**--**
Parathion	0	6.5E-02	1.3E-02	na	--	3.1E-01	7.4E-02	na	--	--	--	--	--	--	--	--	--	**3.1E-01**	**7.4E-02**	**na**	**--**
PCB Total[C]	0	--	1.4E-02	na	6.4E-04	--	7.9E-02	na	1.7E-02	--	--	--	--	--	--	--	--	**--**	**7.9E-02**	**na**	**1.7E-02**
Pentachlorophenol [C]	0	3.5E+00	2.7E+00	na	3.0E+01	1.7E+01	1.5E+01	na	7.8E+02	--	--	--	--	--	--	--	--	**1.7E+01**	**1.5E+01**	**na**	**7.8E+02**
Phenol	0	--	--	na	8.6E+05	--	--	na	2.2E+07	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**2.2E+07**
Pyrene	0	--	--	na	4.0E+03	--	--	na	1.0E+05	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**1.0E+05**
Radionuclides	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**--**
Gross Alpha Activity (pCi/L)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**--**
Beta and Photon Activity (mrem/yr)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**--**
Radium 226 + 228 (pCi/L)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**--**
Uranium (ug/l)	0	--	--	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	9.7E+01	2.8E+01	na	1.1E+05	--	--	--	--	--	--	--	--	**9.7E+01**	**2.8E+01**	**na**	**1.1E+05**
Silver	0	4.1E-01	--	na	--	2.0E+00	--	na	--	--	--	--	--	--	--	--	--	**2.0E+00**	**--**	**na**	**--**
Sulfate	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**--**
1,1,2,2-Tetrachloroethane[C]	0	--	--	na	4.0E+01	--	--	na	1.0E+03	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**1.0E+03**
Tetrachloroethylene[C]	0	--	--	na	3.3E+01	--	--	na	8.6E+02	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**8.6E+02**
Thallium	0	--	--	na	4.7E-01	--	--	na	1.2E+01	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**1.2E+01**
Toluene	0	--	--	na	6.0E+03	--	--	na	1.6E+05	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**1.6E+05**
Total dissolved solids	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**--**
Toxaphene [C]	0	7.3E-01	2.0E-04	na	2.8E-03	3.5E+00	1.1E-03	na	7.3E-02	--	--	--	--	--	--	--	--	**3.5E+00**	**1.1E-03**	**na**	**7.3E-02**
Tributyltin	0	4.6E-01	7.2E-02	na	--	2.2E+00	4.1E-01	na	--	--	--	--	--	--	--	--	--	**2.2E+00**	**4.1E-01**	**na**	**--**
1,2,4-Trichlorobenzene	0	--	--	na	7.0E+01	--	--	na	1.8E+03	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**1.8E+03**
1,1,2-Trichloroethane[C]	0	--	--	na	1.6E+02	--	--	na	4.2E+03	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**4.2E+03**
Trichloroethylene [C]	0	--	--	na	3.0E+02	--	--	na	7.8E+03	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**7.8E+03**
2,4,6-Trichlorophenol [C]	0	--	--	na	2.4E+01	--	--	na	6.2E+02	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**6.2E+02**
2-(2,4,5-Trichlorophenoxy) propionic acid (Silvex)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**--**
Vinyl Chloride[C]	0	--	--	na	2.4E+01	--	--	na	6.2E+02	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**6.2E+02**
Zinc	0	4.1E+01	4.0E+01	na	2.6E+04	2.0E+02	2.3E+02	na	6.8E+05	--	--	--	--	--	--	--	--	**2.0E+02**	**2.3E+02**	**na**	**6.8E+05**

Notes:

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

Metal	Target Value (SSTV)
Antimony	1.7E+04
Arsenic	5.1E+02
Barium	na
Cadmium	1.4E+00
Chromium III	8.9E+01
Chromium VI	3.1E+01
Copper	8.0E+00
Iron	na
Lead	9.1E+00
Manganese	na
Mercury	2.6E+00
Nickel	2.4E+01
Selenium	1.7E+01
Silver	7.8E-01
Zinc	7.9E+01

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

STATS.exe (Version 2.0.4) :

Ammonia:

```
Facility  = Stony Creek WWTF (0.04 MGD)
Chemical  = Ammonia (mg/L)
Chronic averaging period =  30
WLAa    =  208
WLAc    =  53.3
Q.L.      = 0.1
# 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

Facility  = Stony Creek WWTF (0.06 MGD)
Chemical  = Ammonia (mg/L)
Chronic averaging period =  30
WLAa    =  144
WLAc    =  36.1
Q.L.      = 0.1
# 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
```

TRC:

```
Facility  = Stony Creek WWTF (0.04 MGD)
Chemical  = Chlorine, total residual (ug/L)
Chronic averaging period =  4
```

```
WLAa    =  130
WLAc    =  88
Q.L.      = 20
# 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 Chronic Toxicity

```
Maximum Daily Limit   = 128.706580996684
```

Average Weekly limit = 78.6020365710888

Average Monthly limit = 63.7897054710064

```
The data are:
 20000

Facility  = Stony Creek WWTF (0.060 MGD)
Chemical  = Chlorine, total residual (ug/L)
Chronic averaging period =  4
WLAa    =  92
WLAc    =  62
Q.L.      = 20
# samples/mo. = 90
# samples/wk. = 21
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 Chronic Toxicity

```
Maximum Daily Limit   = 90.6796366113003
```

Average Weekly limit = 47.2178634141153

Average Monthly limit = 41.6974597018831

```
The data are:
 20000
```

Chlorides:

```
Facility  = Stony Creek WWTF (0.04 MGD)
Chemical  = Chlorides (mg/L)
Chronic averaging period =  4
```

```
WLAa    =  5800000
WLAc    =  1800000
Q.L.      = 1
# samples/mo. = 1
# samples/wk. = 1
Summary of Statistics:
# observations = 1
Expected Value =  62
Variance       =  1383.84
C.V.           = 0.6
97th percentile daily values  =  150.871
97th percentile 4 day average =  103.154
97th percentile 30 day average=  74.7753
# < Q.L.       =  0
Model used     = BPJ Assumptions, type 2 data
```

No Limit is required for this material

```
The data are:
62

Facility  = Stony Creek WWTF (0.06 MGD)
Chemical  = Chlorides (mg/L)
Chronic averaging period =  4
WLAa    =  4200000
WLAc    =  1300000
Q.L.      = 1
# samples/mo. = 1
# samples/wk. = 1
Summary of Statistics:
# observations = 1
Expected Value =  62
Variance       =  1383.84
C.V.           = 0.6
97th percentile daily values  =  150.871
97th percentile 4 day average =  103.154
97th percentile 30 day average=  74.7753
# < Q.L.       =  0
Model used     = BPJ Assumptions, type 2 data
```

No Limit is required for this material

```
The data are:
62
```

Copper:

```
Facility  = Stony Creek WWTF (0.040 MGD)
Chemical  = Copper, dissolved (ug/L)
Chronic averaging period =  4
WLAa    =  27
WLAc    =  23
Q.L.      = 0.5
# samples/mo. = 1
# samples/wk. = 1
Summary of Statistics:
# observations = 1
```

```
Expected Value =  5
Variance       =  9
C.V.           = 0.6
97th percentile daily values  =  12.1670
97th percentile 4 day average =  8.31895
97th percentile 30 day average=  6.03026
# < Q.L.       =  0
Model used     = BPJ Assumptions, type 2 data
```
No Limit is required for this material
```
The data are:
   5

 Facility  = Stony Creek WWTF (0.060 MGD)
Chemical  = Copper, dissolved (ug/L)
Chronic averaging period =  4
WLAa    =  20
WLAc    =  17
Q.L.      = 0.5
# samples/mo. = 1
# samples/wk. = 1
Summary of Statistics:
# observations = 1
Expected Value =  5
Variance       =  9
C.V.           = 0.6
97th percentile daily values  =  12.1670
97th percentile 4 day average =  8.31895
97th percentile 30 day average=  6.03026
# < Q.L.       =  0
Model used     = BPJ Assumptions, type 2 data
```
No Limit is required for this material
```
The data are:
 5
```

Nickel:
```
 Facility  = Stony Creek WWTF (0.040 MGD)
Chemical  = Nickel, dissolved (ug/L)
Chronic averaging period =  4
WLAa    =  410
WLAc    =  53
Q.L.      = 0.94
# samples/mo. = 1
# samples/wk. = 1
Summary of Statistics:
# observations = 1
Expected Value =  2.4
Variance       =  2.0736
C.V.           = 0.6
97th percentile daily values  =  5.84020
97th percentile 4 day average =  3.99309
97th percentile 30 day average=  2.89452
# < Q.L.       =  0
```

```
Model used     = BPJ Assumptions, type 2 data
```
No Limit is required for this material
```
The data are:
 2.4

 Facility  = Stony Creek WWTF (0.060 MGD)
Chemical  = Nickel, dissolved (ug/L)
Chronic averaging period =  4
WLAa    =  310
WLAc    =  39
Q.L.      = 0.94
# samples/mo. = 1
# samples/wk. = 1
Summary of Statistics:
# observations = 1
Expected Value =  2.4
Variance       =  2.0736
C.V.           = 0.6
97th percentile daily values  =  5.84020
97th percentile 4 day average =  3.99309
97th percentile 30 day average=  2.89452
# < Q.L.       =  0
Model used     = BPJ Assumptions, type 2 data
```
No Limit is required for this material
```
The data are:
 2.4
```

Zinc:

```
 Facility  = Stony Creek WWTF (0.040 MGD)
Chemical  = Zinc, dissolved (ug/L)
Chronic averaging period =  4
WLAa    =  260
WLAc    =  310
Q.L.      = 3.6
# samples/mo. = 1
# samples/wk. = 1
Summary of Statistics:
# observations = 1
Expected Value =  10
Variance       =  36
C.V.           = 0.6
97th percentile daily values  =  24.3341
97th percentile 4 day average =  16.6379
97th percentile 30 day average=  12.0605
# < Q.L.       =  0
Model used     = BPJ Assumptions, type 2 data
```
No Limit is required for this material
```
The data are:
 10

 Facility  = Stony Creek WWTF (0.060 MGD)
```

```
Chemical  = Zinc, dissolved (ug/L)
Chronic averaging period =  4
WLAa    =  200
WLAc    =  230
Q.L.      = 3.6
# samples/mo. = 1
# samples/wk. = 1
Summary of Statistics:
# observations = 1
Expected Value =  10
Variance       =  36
C.V.           = 0.6
97th percentile daily values  =  24.3341
97th percentile 4 day average =  16.6379
97th percentile 30 day average=  12.0605
# < Q.L.       =  0
Model used     = BPJ Assumptions, type 2 data
```

No Limit is required for this material

```
The data are:
 10
```

Chromium VI:

```
Facility  = Stony Creek WWTF (0.040 MGD)
Chemical  = Chromium VI, dissolved (ug/L)
Chronic averaging period =  4
WLAa    =  110
WLAc    =  88
Q.L.      = 1.6
# samples/mo. = 1
# samples/wk. = 1
Summary of Statistics:
# observations = 1
Expected Value =  3
Variance       =  3.24
C.V.           = 0.6
97th percentile daily values  =  7.30025
97th percentile 4 day average =  4.99137
97th percentile 30 day average=  3.61815
# < Q.L.       =  0
Model used     = BPJ Assumptions, type 2 data
No Limit is required for this material
The data are:
 3

Facility  = Stony Creek WWTF (0.060 MGD)
Chemical  = Chromium VI, dissolved (ug/L)
Chronic averaging period =  4
WLAa    =  77
WLAc    =  62
Q.L.      = 1.6
# samples/mo. = 1
```

```
# samples/wk. = 1
Summary of Statistics:
# observations = 1
Expected Value =  3
Variance       =  3.24
C.V.           = 0.6
97th percentile daily values  =  7.30025
97th percentile 4 day average =  4.99137
97th percentile 30 day average=  3.61815
# < Q.L.       =  0
Model used     = BPJ Assumptions, type 2 data
```
No Limit is required for this material
```
The data are:
 3
```

Silver:

```
Facility  = Stony Creek WWTF (0.040 MGD)
Chemical  = Silver, dissolved (ug/L)
Chronic averaging period =  4
WLAa    =  2.5
WLAc    =
Q.L.      = 0.2
# samples/mo. = 1
# samples/wk. = 1
Summary of Statistics:
# observations = 1
Expected Value =  .5
Variance       =  .09
C.V.           = 0.6
97th percentile daily values  =  1.21670
97th percentile 4 day average =  .831895
97th percentile 30 day average=  .603026
# < Q.L.       =  0
Model used     = BPJ Assumptions, type 2 data
No Limit is required for this material
The data are:
 0.5

Facility  = Stony Creek WWTF (0.060 MGD)
Chemical  = Silver, dissolved (ug/L)
Chronic averaging period =  4
WLAa    =  2
WLAc    =
Q.L.      = 0.20
# samples/mo. = 1
# samples/wk. = 1
Summary of Statistics:
# observations = 1
Expected Value =  .5
Variance       =  .09
C.V.           = 0.6
```

```
97th percentile daily values  =  1.21670
97th percentile 4 day average =  .831895
97th percentile 30 day average=  .603026
# < Q.L.       =  0
Model used     = BPJ Assumptions, type 2 data
No Limit is required for this material
The data are:
 0.5
```

Stony Creek WWTF
VPDES No. VA0062669

Calculations for Pollutant Loading Limitations

0.040 MGD Facility:

	Monthly Average	Weekly Average
BOD_5:	(30 mg/L)(0.040 MGD/day)(3.785 lbs/MG/mg/L) = **4.5 kg/day** (4,500 g/day)	(45 mg/L)(0.040 MGD/day)(3.785 lbs/MG/mg/L) = **6.8 kg/day** (6,800 g/day)
TSS:	(30 mg/L)(0.040 MGD/Day)(3.785 lbs/MG/mg/L) = **4.5 kg/day** (4,500 g/day)	(45 mg/L)(0.040 MGD/day)(3.785 lbs/MG/mg/L) = **6.8 kg/day** (6,800 g/day)

0.060 MGD Facility:

	Monthly Average	Weekly Average
$cBOD_5$:	(15 mg/L)(0.060 MGD/day)(3.785 lbs/MG/mg/L) = **3.4 kg/day** (3,400 g/day)	(20 mg/L)(0.060 MGD/day)(3.785 lbs/MG/mg/L) = **4.5 kg/day** (4,500 g/day)
TKN:	(8.0 mg/L)(0.060 MGD/day)(3.785 lbs/MG/mg/L) = **1.8 kg/day** (1,800 g/day)	(12 mg/L)(0.060 MGD/day)(3.785 lbs/MG/mg/L) = **2.7 kg/day** (2,700 g/day)
TSS:	(30 mg/L)(0.060 MGD/day)(3.785 lbs/MG/mg/L) = **6.8 kg/day** (6,800 g/day)	(45 mg/L)(0.060 MGD/day)(3.785 lbs/MG/mg/L) = **10 kg/day** (10,000 g/day)

Attachment F – Groundwater Monitoring Data Analysis Report

VA0062669 Stony Creek WWTF
Groundwater Monitoring Data Analysis Report – February 2016

Introduction:

The Stony Creek Wastewater Treatment Facility is a publically-owned treatment works in Stony Creek, VA. The facility includes two lagoons which are located less than a quarter-mile east of Highway I-95 and are therefore considered within the borders of the Coastal Plain Physiographic Province. The facility conducts annual groundwater monitoring of its three monitoring wells in accordance with its VPDES permit (No. VA0062669) and the facility's approved groundwater monitoring plan.

Nineteen sets of annual groundwater data submitted to DEQ from December 1994 to September 2015 were evaluated to assess the facility's impact on groundwater and to determine if corrective action(s) are required. The parameters included in this evaluation are as follows: Ammonia-nitrogen, nitrate-nitrogen, chloride, pH, specific conductivity and total organic carbon. It should be noted, however, that groundwater data for all parameters in 1995 and 1999 were not available for this evaluation; additionally, 1994-1997 ammonia data was unavailable.

Data from each monitoring well were first tested for normality and lognormality using the Shapiro-Wilk test. Down-gradient data were then tested for significance to background (up-gradient) data using the Wilcoxon Rank Sum test (applicable to non-normal data) and the Cochran's Approximation to the Behrens-Fisher Students T-test (applicable to normal or normalized data). Additionally, a Linear Regression Trend analysis was applied to each monitoring well for each pollutant in order to determine increasing or decreasing trends in each well. These tests were programmed into Excel by DEQ Piedmont Regional Staff using formulas and descriptions found in EPA's *Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Unified Guidance (EPA 530/R-09-007)*, revised March 2009. The up-gradient background monitoring well is referred to in the analysis as "MW-1" and the down-gradient monitoring wells are referred to as "MW-2" and "MW-3".

Parameter Evaluations, Results and Conclusions:

- **Ammonia:**
  Significance to Background: Test results indicate that there is not a statistically significant difference between the background well and either of the down-gradient wells. 43 of 48 (90%) of the samples tested between 1998 and 2015 were non-detectable at the quantification level (QL) used. For the purposes of this evaluation, all samples that were non-detectable are considered absent. The QLs used for the sample analyses were 0.1 mg/L and 0.2 mg/L, both of which are higher than the ammonia groundwater standard of 0.025 mg/L. Of the five samples that were detectable above the respective QL used for the analysis, two of these samples were taken from the background MW-1, one sample was taken from MW-2 and two were taken from MW-3.

  Regression Trend: Linear trend analyses indicate slight increases in the concentration of this parameter in monitoring wells MW-1 and MW-3, with a slight decrease in MW-2. Pearson correlations indicate moderately weak (for MW-3) to very weak (for MW-1 and MW-2) degrees of linearity between the sample dates and the concentration data.

  Groundwater Standards: The groundwater standard for ammonia for the Coastal Plain Physiographic Province is 0.025 mg/L.

  Conclusion: While actual data above the QL is limited, the evaluation appears to indicate that down-gradient wells are not statistically different from background and therefore, will not warrant a need for corrective action at this time; however, continued monitoring of ammonia is necessary.

- **Chlorides:**
  Significance to Background: Test results indicate that there is not a statistically significant difference between the background well and either of the down-gradient wells.

Regression Trend: Linear trend analyses indicate slight increases in the concentration of this parameter in monitoring wells MW-1 and MW-3, with a slight decrease in MW-2. Pearson correlations indicate a moderately weak degree of data linearity for MW-1, a very weak degree of data linearity for MW-2 and a moderately strong degree of data linearity for MW-3.

Groundwater Standards: There is no groundwater standard for chlorides; however, there is a non-mandatory groundwater criterion of 50 mg/L for the Coastal Plain Physiographic Province. There were no observed values above the criterion at any of the monitoring wells during the nineteen years of sampling.

Conclusion: Due to acceptable levels of chlorides below the groundwater criterion and because there was no statistical difference between background monitoring well data and down-gradient monitoring well data, no corrective action is warranted for chlorides at this time. Continued monitoring of chlorides, however, is necessary.

- **Nitrates:**
  Significance to Background: Test results indicate that there is not a statistically significant difference between the background well and either of the down-gradient wells.

  Regression Trend: Linear trend analyses indicate slight decreases in the concentration of this parameter in monitoring wells MW-1 and MW-2, with a slight increase in MW-3. Pearson correlations indicate a moderately weak degree of data linearity for MW-1, a very weak degree of data linearity for MW-2 and a moderately weak degree of data linearity for MW-3.

  Groundwater Standards: The groundwater standard for nitrate for the Coastal Plain Physiographic Province is 5 mg/L. There were no observed violations of the standard at any of the monitoring wells during the nineteen years of sampling.

  Conclusion: Down-gradient well data sets were not statistically different from background and no observed violations of the nitrate groundwater standard occurred at any of the monitoring wells; therefore, no corrective action is warranted for nitrates at this time. Continued monitoring of nitrates, however, is necessary.

- **pH:**
  Significance to Background: Test results indicate that there is not a statistically significant difference between the background well and either of the down-gradient wells.

  Regression Trend: Linear trend analyses indicate slight pH decreases over time for background MW-1 as well as the down-gradient monitoring wells MW-2 and MW-3.

  Groundwater Standards: The pH groundwater standard for the Coastal Plain Physiographic Province is 6.5-9.0 S.U. Violations of the minimum pH standard were observed at all monitoring wells, both background and down-gradient. Eleven samples from background monitoring well MW-1, fourteen samples from MW-2 and nine samples from MW-3 were observed to be below the minimum pH groundwater standard.

  Conclusion: The Cochran's Approximation to the Behrens-Fisher Students T-test indicated that pH levels at MW-2 and MW-3 were not statistically different from background observations at MW-1. The ambient pH in the area may be more naturally acidic, as evidenced by the background MW-1 data. It should also be noted that the facility is very close to the Piedmont and Blue Ridge Physiographic Province, which is assigned a lower groundwater standard of 5.5 – 8.5 S.U. No corrective action is believed to be warranted for pH at this time; however, continued pH monitoring is necessary.

Specific Conductivity:
Significance to Background: Test results indicate that there is not a statistically significant difference between the background well and either of the down-gradient wells.

Regression Trend: Linear trend analyses indicate slight increases in the concentration of this parameter in monitoring wells MW-1 and MW-3, with a slight decrease in MW-2. Pearson correlations indicate a moderately strong degree of data linearity for MW-1 and moderately weak degrees of data linearity for MW-2 and MW-3.

Groundwater Standards: There is neither a groundwater standard nor a groundwater criterion for specific conductance. This parameter is required to be sampled because it is a good general indicator of changes in pollutant levels, specifically, ionic solutions.

Conclusion: There is neither a groundwater standard nor a non-mandatory criterion for specific conductivity. The down-gradient wells were not observed to be statistically different from background; therefore, no corrective action for the parameter is warranted at this time. Continued monitoring of specific conductivity, however, is necessary.

Total Organic Carbon (TOC):
Significance to Background: Test results indicate that there is not a statistically significant difference between the background well and either of the down-gradient wells.

Regression Trend: Linear trend analyses indicate slight decreases in the concentration of this parameter in all monitoring wells. Pearson correlations indicate moderately weak degrees of data linearity for MW-1 and MW-3 and a moderately strong degree of data linearity for MW-2.

Groundwater Standards: There is no groundwater standard for TOC; however, there is a non-mandatory TOC groundwater criterion of 10 mg/L for the Coastal Plain Physiographic Province. During the nineteen years of sampling, only one sample from MW-1 and one sample from MW-3 (both taken in 1994) exceeded the non-mandatory criterion.

Conclusion: The down-gradient wells were not observed to be statistically different from background; therefore, no corrective action for the parameter is warranted at this time. Continued monitoring of TOC, however, is necessary.

Discussion and Recommendations:

Evaluation of groundwater monitoring well data, submitted from 1994 to 2015, provided no clear indication that violations of groundwater standards or groundwater criteria specifically attributed to the Stony Creek WWTF have occurred or are occurring. Where violations of standards or criteria for a particular parameter have been observed (e.g., pH, ammonia and TOC), ambient parameter data are statistically the same as the down-gradient data. No corrective actions are believed to be warranted at this time; however, continued monitoring for all parameters in accordance with the approved groundwater monitoring plan is recommended for future analyses.

Groundwater Monitoring Data Analysis (v.3)

Facility Name:	Stony Creek WWTF
Permit No.:	VA0062669
Monitoring Parameter:	Ammonia
Applicable GW Standard (if none leave blank):	0.025
Applicable GW Criteria (if none leave blank):	
Concentration Units (all data):	mg/L

		Data Entry					
	Well Designation ►						
	Sample or Report Date (ascending)	Background Well Data	Compliance Well #1	Compliance Well #2	Compliance Well #3	Compliance Well #4	Compliance Well #5
1	8/10/1998	<0.1	<0.1	<0.1			
2	9/25/2000	0.14	0.18	<0.1			
3	8/27/2001	0.14	0.15	0.13			
4	8/15/2002	<0.1	0.1	<0.1			
5	7/22/2003	<0.2	<0.2	<0.2			
6	8/10/2004	<0.2	<0.2	<0.2			
7	8/22/2005	<0.2	<0.2	<0.2			
8	8/15/2006	<0.2	<0.2	<0.2			
9	8/23/2007	<0.2	<0.2	<0.2			
10	9/22/2008	<0.2	<0.2	<0.2			
11	11/9/2010	<0.2	<0.2	<0.2			
12	11/14/2011	<0.2	<0.2	<0.2			
13	8/13/2012	<0.2	<0.2	<0.2			
14	8/26/2013	<0.2	<0.2	<0.2			
15	9/24/2014	<0.2	<0.2	<0.2			
16	9/9/2015	<0.2	<0.2	<0.2			
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Results: Significance to Background **

	Distribution Tests		Non-normal Test	Normal Tests	
	Shapiro-Wilk Normality Test	Shapiro-Wilk Log Normality Test	Wilcoxon Rank Sum Test	T-test	T-test (lognormal)
Background Well	Not normal	Not normal	N/A		
Compliance Well #1	Not normal	Not normal	Not Significant	Not Significant	Not Significant
Compliance Well #2	Not normal	Not normal	Not Significant	Not Significant	Not Significant
Compliance Well #3					
Compliance Well #4					
Compliance Well #5					

** Please note that the above cells will appear blank in cases where a test cannot be conducted due to lack of data, or if the test assumptions are invalid due to lack of data variation.

Results: Linear Regression Trend Analysis and Interpretation of Data

	Regression Line Slope	Pearson Correlation (R)	Interpretation	
			Linear Trend	Degree of Data Linearity
Background Well	1.18149E-06	0.098536133	Slight Increase	Very Weak
Compliance Well #1	-2.49229E-06	-0.179188772	Slight Decrease	Very Weak
Compliance Well #2	5.46113E-06	0.475511198	Slight Increase	Moderately Weak
Compliance Well #3				
Compliance Well #4				
Compliance Well #5				

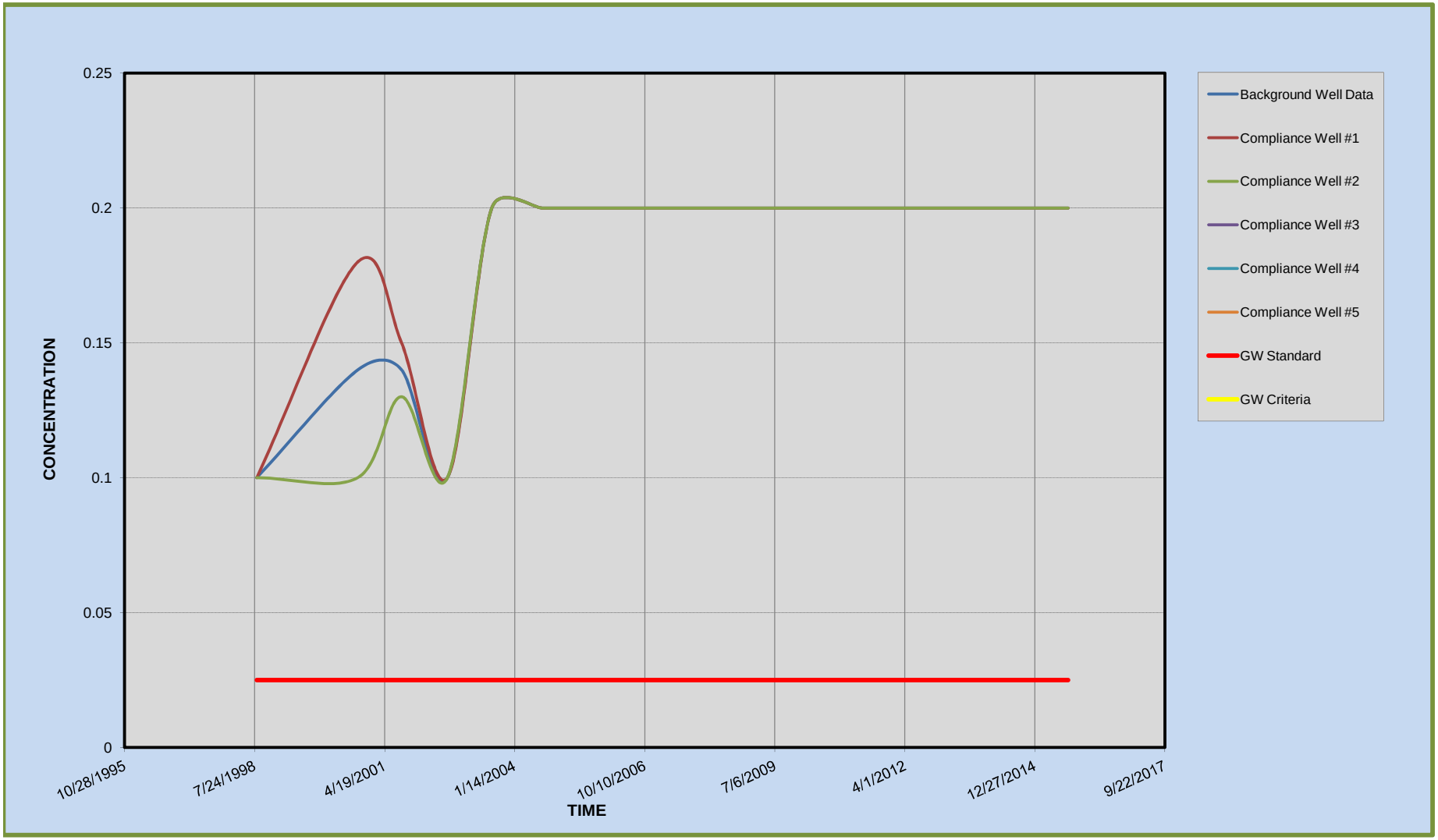
Results: Groundwater Standards/Criteria Comparison

	Groundwater Standard		Groundwater Criteria		Total No. of Data Points
	No. Violations of GW Standard	% Violations of GW Standard	No. Violations of GW Criteria	% Violations of GW Criteria	
Background Well	16	100%			16
Compliance Well #1	16	100%			16
Compliance Well #2	16	100%			16
Compliance Well #3					
Compliance Well #4					
Compliance Well #5					

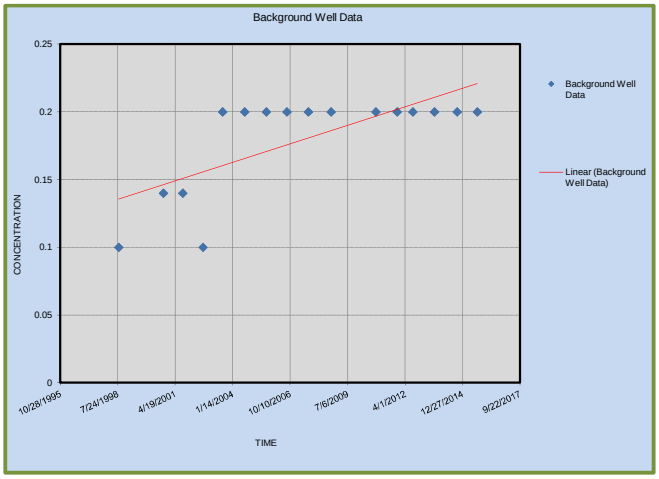
Results: Basic Statistics (less-than values ignored)

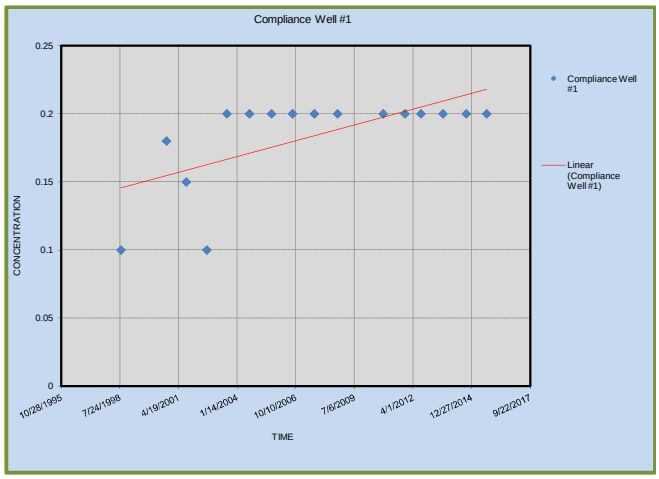
	Maximum Value	Minimum Value	Average		
Background Well	0.140	0.140	0.140		
Compliance Well #1	0.180	0.100	0.143		
Compliance Well #2	0.130	0.130	0.130		
Compliance Well #3					
Compliance Well #4					
Compliance Well #5					

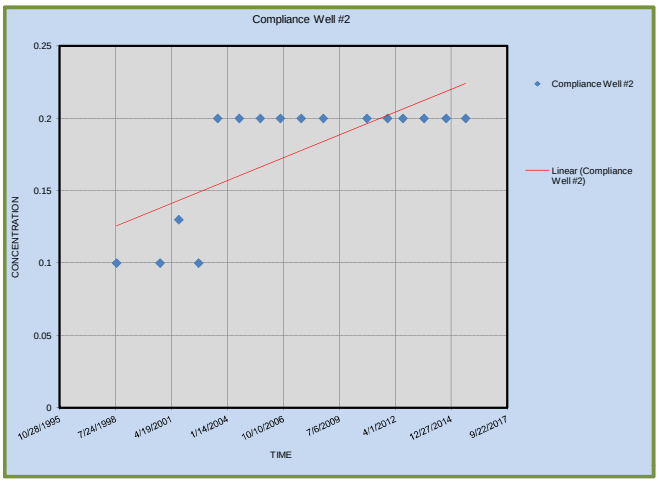
Stony Creek WWTF: Groundwater Monitoring Data for Ammonia

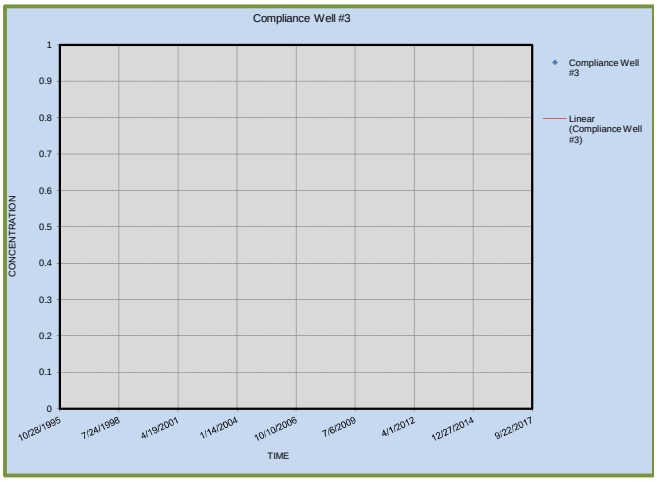


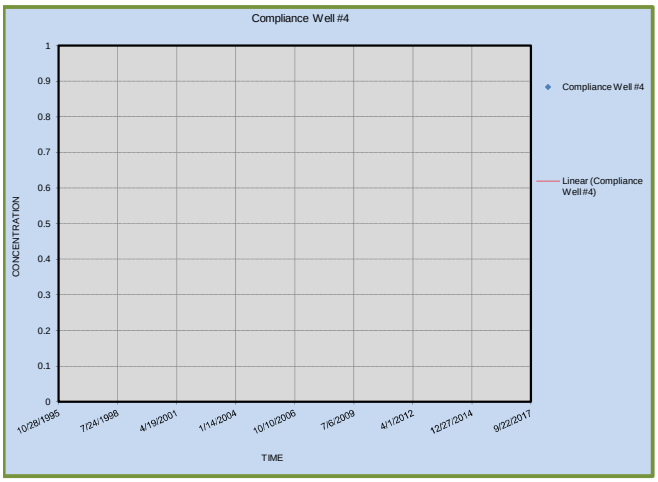
Stony Creek WWTF: Groundwater Monitoring Regression Trends for Ammonia

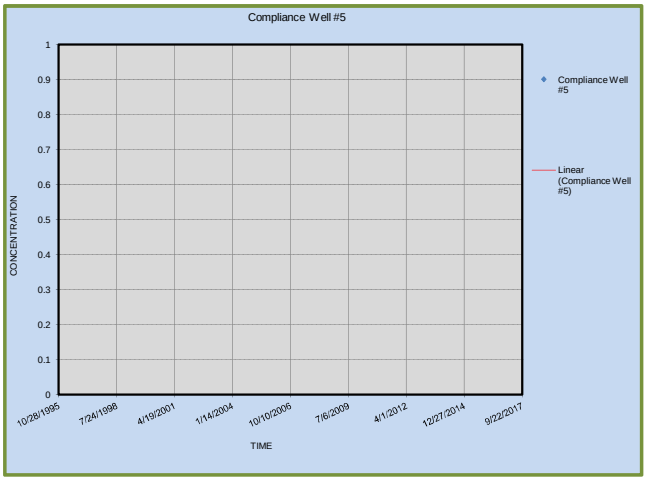












Groundwater Monitoring Data Analysis (v.3)

Facility Name:	Stony Creek WWTF
Permit No.:	VA0062669
Monitoring Parameter:	Chloride
Applicable GW Standard (if none leave blank):	
Applicable GW Criteria (if none leave blank):	50
Concentration Units (all data):	mg/L

	Data Entry					
Well Designation ►						
	Sample or Report Date (ascending)	Background Well Data	Compliance Well #1	Compliance Well #2	Compliance Well #3	Compliance Well #4	Compliance Well #5
1	12/14/1994	10.7	2.4	10.2			
2	7/31/1996	8	9	3			
3	10/20/1997	7	9	4			
4	8/10/1998	8	7	3			
5	9/25/2000	9	6	2			
6	8/27/2001	8	8	2			
7	8/15/2002	9	11	2			
8	7/22/2003	8	11	3			
9	8/10/2004	9	10	4			
10	8/22/2005	10	11	4			
11	8/15/2006	8	9	3			
12	8/23/2007	8	13	4			
13	9/22/2008	12	16	10			
14	11/9/2010	21	10	5			
15	11/14/2011	14	4	12			
16	8/13/2012	12	3	14			
17	8/26/2013	3	11	14			
18	9/24/2014	13	3	15			
19	9/9/2015	12	4	13			
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Results: Significance to Background **

	Distribution Tests		Non-normal Test	Normal Tests	
	Shapiro-Wilk Normality Test	Shapiro-Wilk Log Normality Test	Wilcoxon Rank Sum Test	T-test	T-test (lognormal)
Background Well	Not normal	Not normal	N/A		
Compliance Well #1	Not normal	Not normal	Not Significant	Not Significant	Not Significant
Compliance Well #2	Not normal	Not normal	Not Significant	Not Significant	Not Significant
Compliance Well #3					
Compliance Well #4					
Compliance Well #5					

** Please note that the above cells will appear blank in cases where a test cannot be conducted due to lack of data, or if the test assumptions are invalid due to lack of data variation.

Results: Linear Regression Trend Analysis and Interpretation of Data

	Regression Line Slope	Pearson Correlation (R)	Interpretation	
			Linear Trend	Degree of Data Linearity
Background Well	0.00058243	0.370470042	Slight Increase	Moderately Weak
Compliance Well #1	-0.000123991	-0.077397183	Slight Decrease	Very Weak
Compliance Well #2	0.001420962	0.688617223	Slight Increase	Moderately Strong
Compliance Well #3				
Compliance Well #4				
Compliance Well #5				

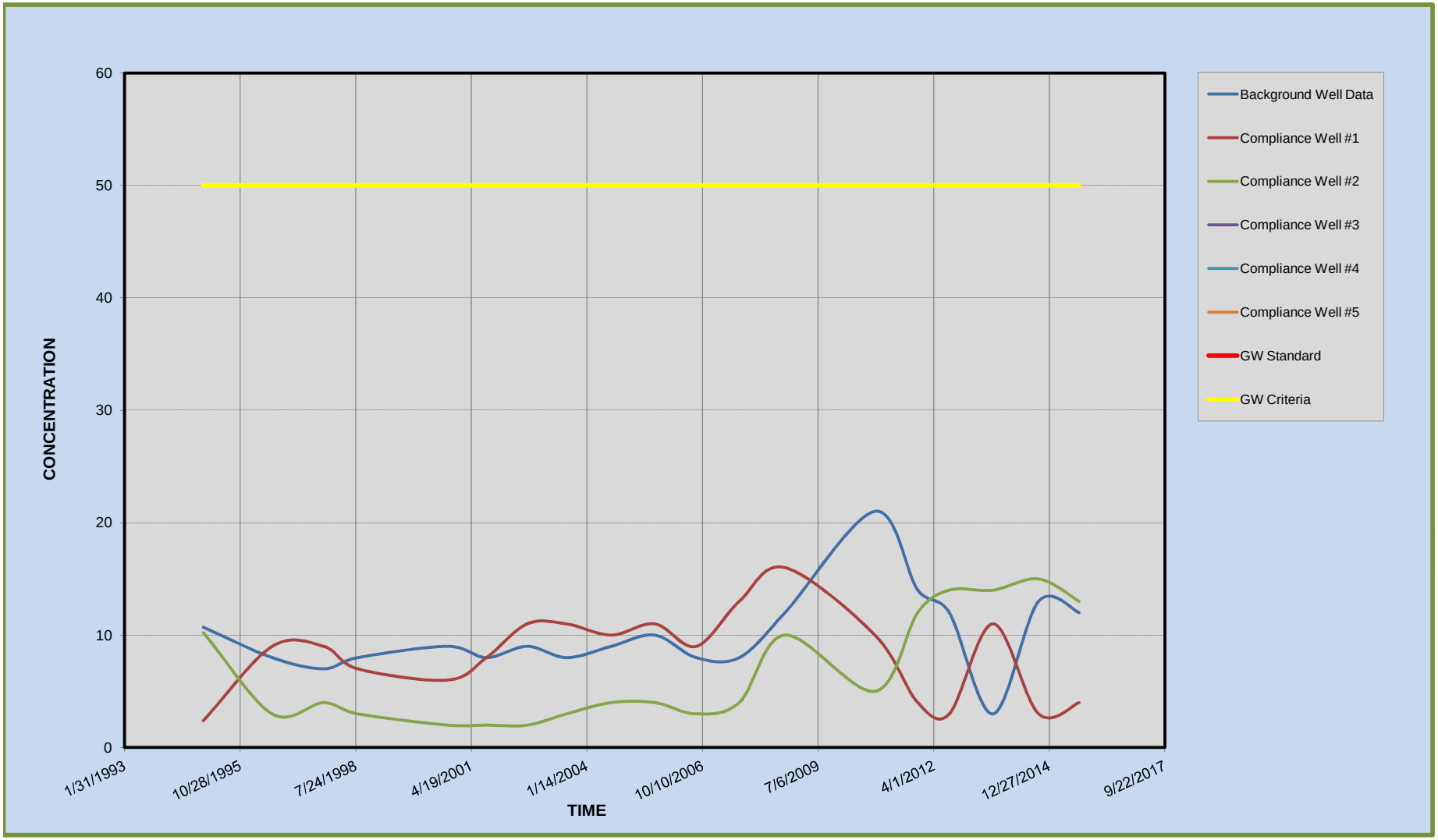
Results: Groundwater Standards/Criteria Comparison

	Groundwater Standard		Groundwater Criteria		Total No. of Data Points
	No. Violations of GW Standard	% Violations of GW Standard	No. Violations of GW Criteria	% Violations of GW Criteria	
Background Well			0	0%	19
Compliance Well #1			0	0%	19
Compliance Well #2			0	0%	19
Compliance Well #3					
Compliance Well #4					
Compliance Well #5					

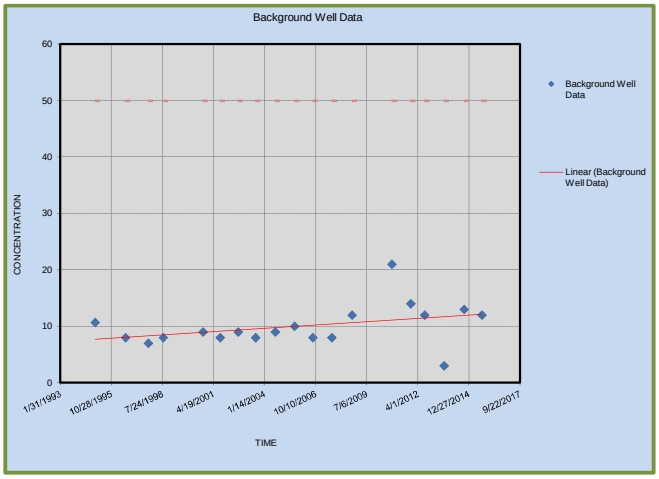
Results: Basic Statistics (less-than values ignored)

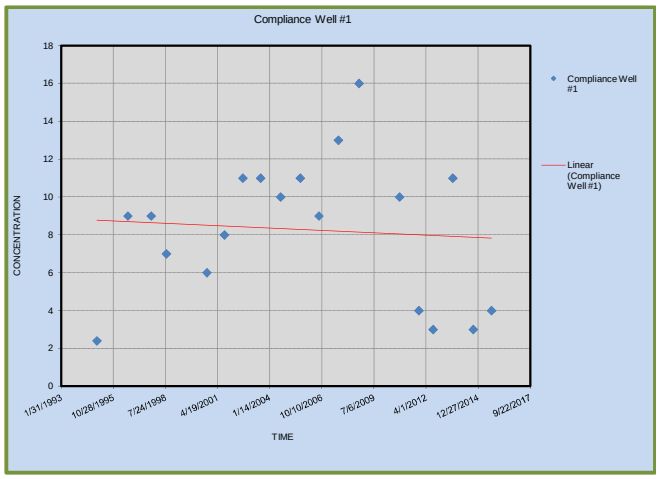
	Maximum Value	Minimum Value	Average		
Background Well	21.000	3.000	9.984		
Compliance Well #1	16.000	2.400	8.284		
Compliance Well #2	15.000	2.000	6.695		
Compliance Well #3					
Compliance Well #4					
Compliance Well #5					

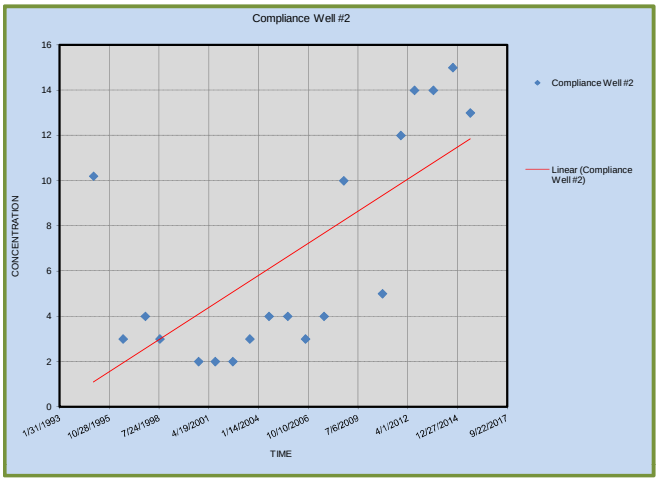
Stony Creek WWTF: Groundwater Monitoring Data for Chloride

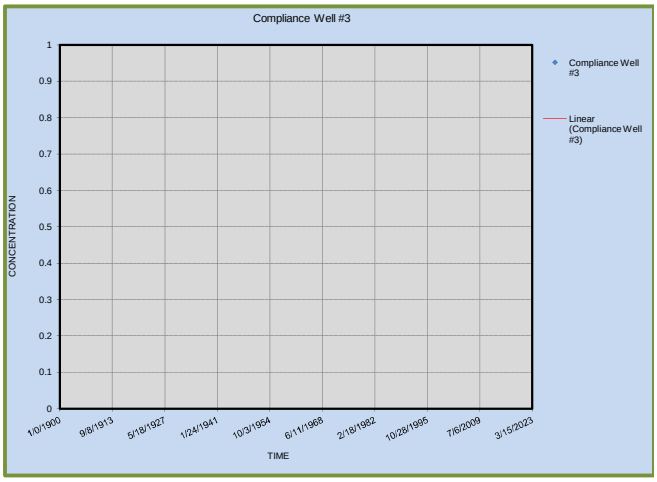


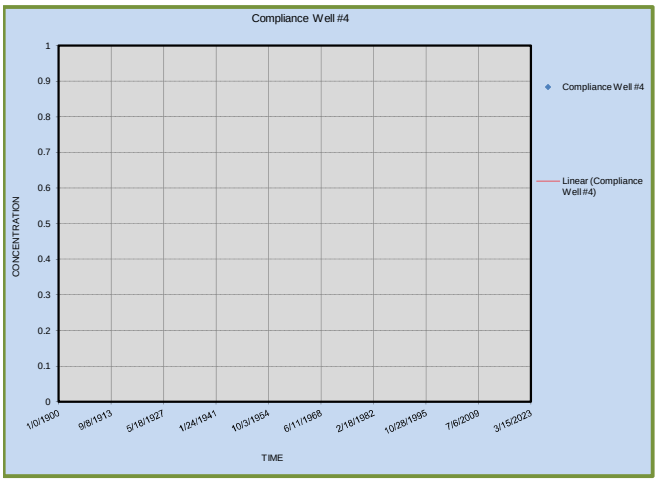
Stony Creek WWTF: Groundwater Monitoring Regression Trends for Chloride

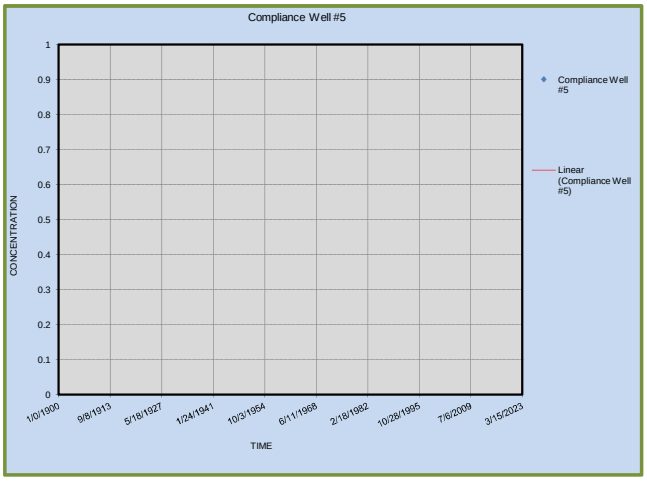












Groundwater Monitoring Data Analysis (v.3)

Facility Name:	Stony Creek WWTF
Permit No.:	VA0062669
Monitoring Parameter:	Nitrate
Applicable GW Standard (if none leave blank):	5
Applicable GW Criteria (if none leave blank):	
Concentration Units (all data):	mg/L

	Data Entry					
Well Designation ►						
Sample or Report Date (ascending)	Background Well Data	Compliance Well #1	Compliance Well #2	Compliance Well #3	Compliance Well #4	Compliance Well #5
12/14/1994	0.2	0.3	0.1			
7/31/1996	0.1	0.25	0.15			
10/20/1997	0.23	0.15	0.1			
8/10/1998	0.42	0.28	0.21			
9/25/2000	0.23	0.16	0.14			
8/27/2001	0.22	0.16	0.17			
8/15/2002	0.22	0.18	0.38			
7/22/2003	0.33	0.16	0.44			
8/10/2004	0.11	0.29	0.1			
8/22/2005	0.1	0.1	0.1			
8/15/2006	0.1	0.8	0.21			
8/23/2007	0.07	0.37	0.44			
9/22/2008	0.1	0.76	0.1			
11/9/2010	0.25	0.35	0.13			
11/14/2011	0.11	0.1	0.29			
8/13/2012	0.15	0.1	0.27			
8/26/2013	0.1	0.1	0.19			
9/24/2014	0.1	0.11	0.37			
9/9/2015	0.1	0.13	0.47			

Results: Significance to Background **

	Distribution Tests		Non-normal Test	Normal Tests	
	Shapiro-Wilk Normality Test	Shapiro-Wilk Log Normality Test	Wilcoxon Rank Sum Test	T-test	T-test (lognormal)
Background Well	Not normal	Not normal	N/A		
Compliance Well #1	Not normal	Not normal	Not Significant	Not Significant	Not Significant
Compliance Well #2	Not normal	Not normal	Not Significant	Not Significant	Not Significant
Compliance Well #3					
Compliance Well #4					
Compliance Well #5					

** Please note that the above cells will appear blank in cases where a test cannot be conducted due to lack of data, or if the test assumptions are invalid due to lack of data variation.

Results: Linear Regression Trend Analysis and Interpretation of Data

	Regression Line Slope	Pearson Correlation (R)	Interpretation	
			Linear Trend	Degree of Data Linearity
Background Well	-1.97021E-05	-0.489648696	Slight Decrease	Moderately Weak
Compliance Well #1	-5.9324E-06	-0.067779226	Slight Decrease	Very Weak
Compliance Well #2	2.4816E-05	0.443747791	Slight Increase	Moderately Weak
Compliance Well #3				
Compliance Well #4				
Compliance Well #5				

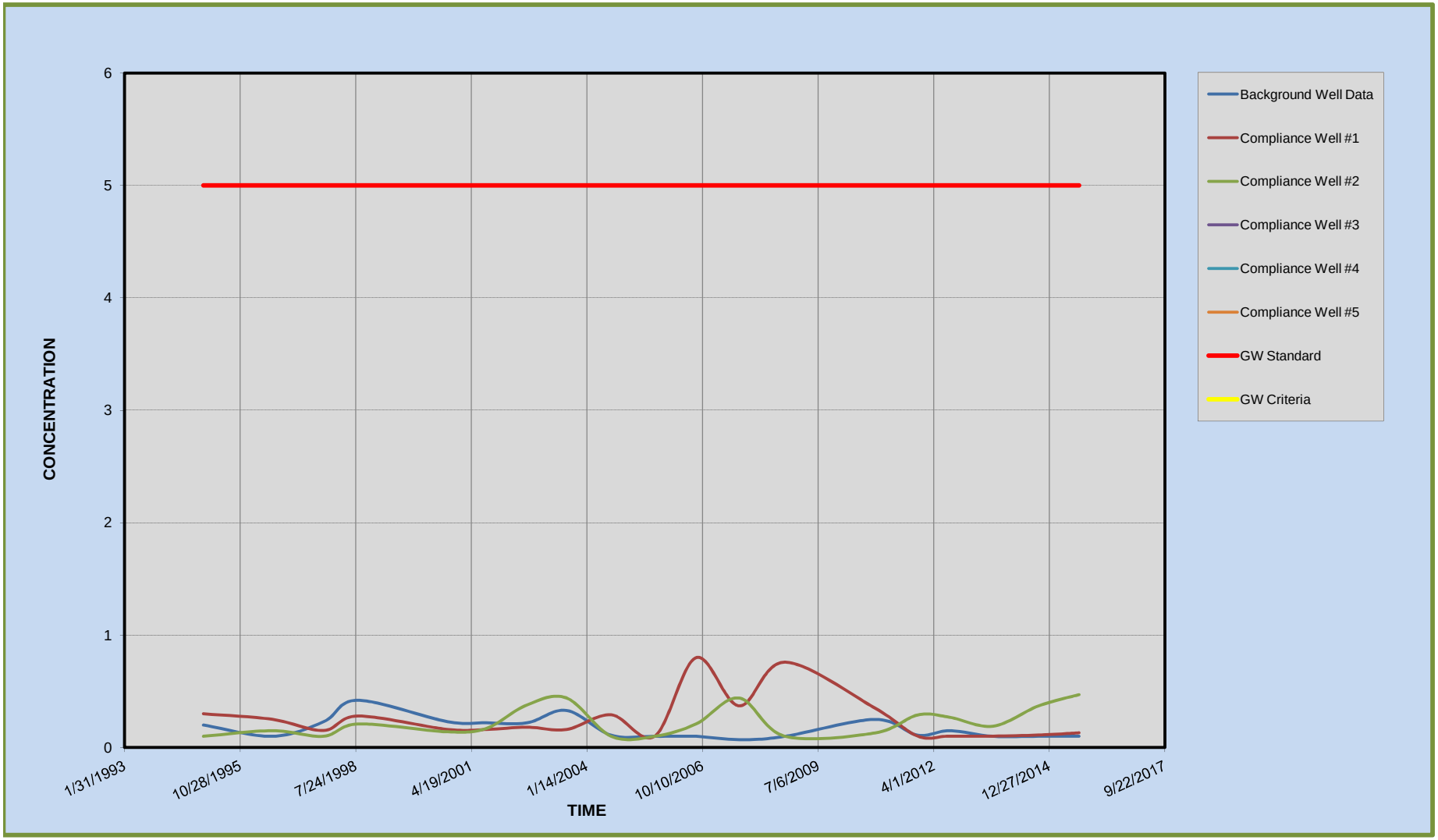
Results: Groundwater Standards/Criteria Comparison

	Groundwater Standard		Groundwater Criteria		Total No. of Data Points
	No. Violations of GW Standard	% Violations of GW Standard	No. Violations of GW Criteria	% Violations of GW Criteria	
Background Well	0	0%			19
Compliance Well #1	0	0%			19
Compliance Well #2	0	0%			19
Compliance Well #3					
Compliance Well #4					
Compliance Well #5					

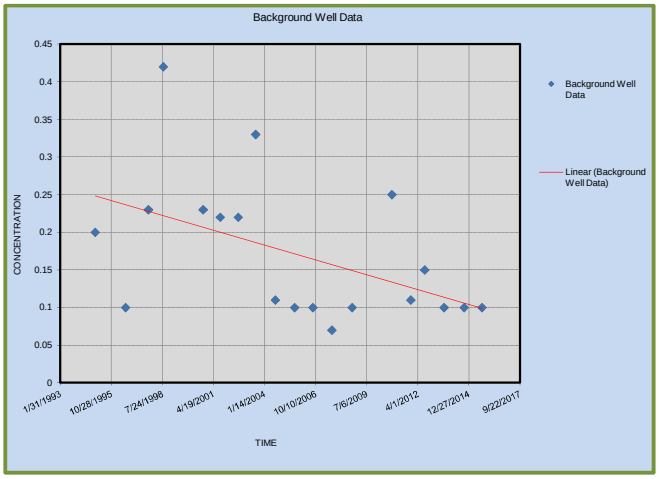
Results: Basic Statistics (less-than values ignored)

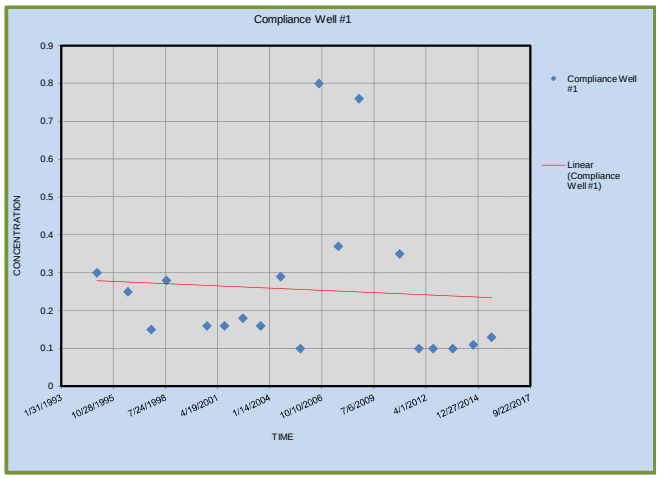
	Maximum Value	Minimum Value	Average		
Background Well	0.420	0.070	0.171		
Compliance Well #1	0.800	0.100	0.255		
Compliance Well #2	0.470	0.100	0.229		
Compliance Well #3					
Compliance Well #4					
Compliance Well #5					

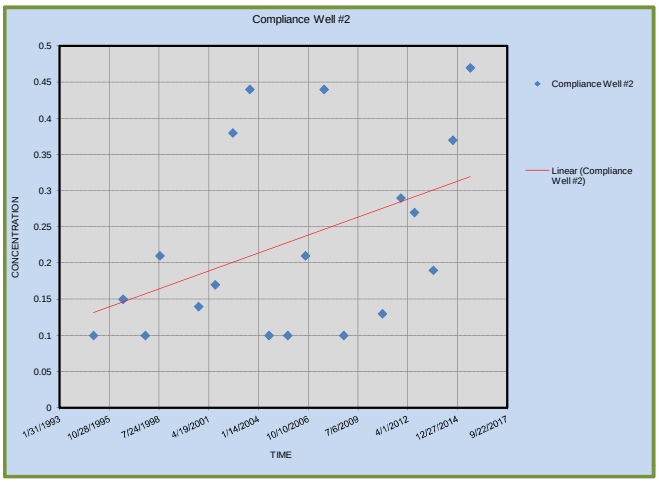
Stony Creek WWTF: Groundwater Monitoring Data for Nitrate

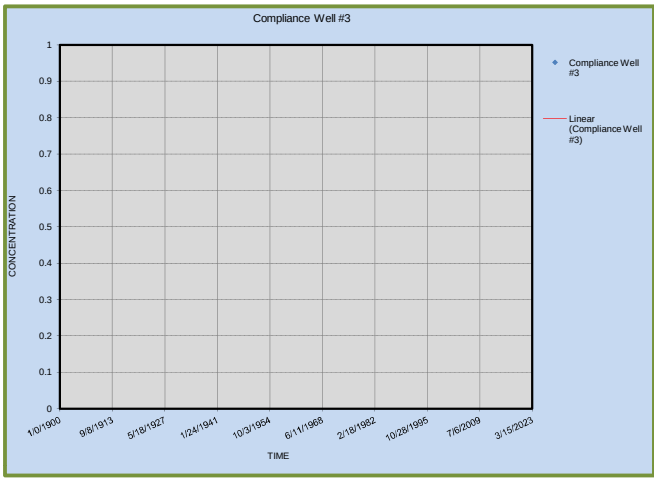


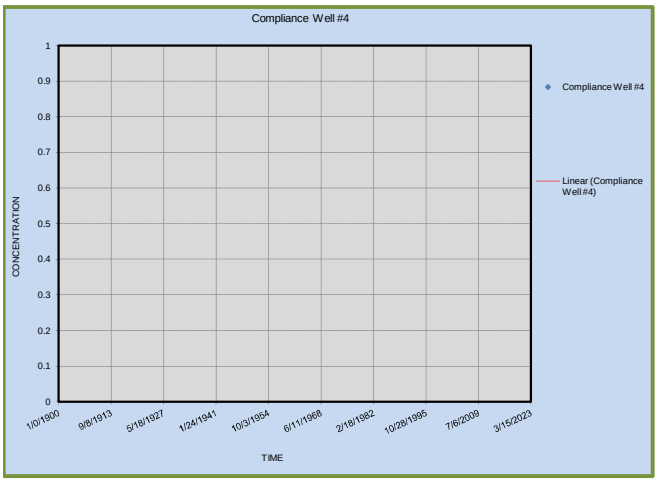
Stony Creek WWTF: Groundwater Monitoring Regression Trends for Nitrate

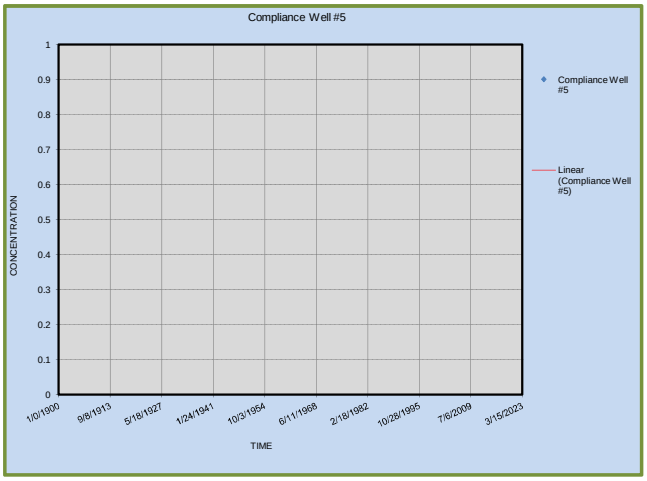












Groundwater Data and Analysis Summary for pH

East Field

Facility Name:	Stony Creek WWTF		
Permit Number:	VA0062669	Date:	3/28/2016
Parameter:	pH	Units:	S.U.
Upgradient Well Designation		MW-1	
Downgradient Well Designation		MW-2	
Downgradient Well Designation		MW-3	
Applicable Groundwater Standard (Lower):		**6.5**	**S.U.**
Applicable Groundwater Standard (Upper):		**9**	**S.U.**

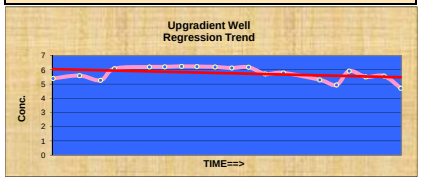
	Significant difference from Upgradient Well using parametric test?	Trend Analysis R-Sq.	Trend Analysis Slope
MW-2	NO	0.1143	-0.0001
MW-3	NO	0.3455	-0.0002

	Groundwater Monitoring Report Date	MW-1 (Upgradient Well)	MW-2	MW-3	#REF!	#REF!	#REF!
1	12/14/1994	5.4	5.8	5.7			
2	7/31/1996	5.6	5.3	6.2			
3	10/20/1997	5.27	5.5	5.96			
4	8/10/1998	6.09	5.72	6.5			
5	9/25/2000	6.21	5.97	6.53			
6	8/27/2001	6.22	6.01	6.59			
7	8/15/2002	6.25	6.05	6.6			
8	7/22/2003	6.24	6.04	6.63			
9	8/10/2004	6.21	6.05	6.62			
10	8/22/2005	6.14	6.07	6.55			
11	8/15/2006	6.19	5.78	6.22			
12	8/23/2007	5.72	5.15	5.43			
13	9/22/2008	5.79	5.21	5.58			
14	11/9/2010	5.3	4.72	5.36			
15	11/14/2011	4.94	5.31	4.66			
16	8/13/2012	5.92	5.65	5.2			
17	8/26/2013	5.51	5.32	6.22			
18	9/24/2014	5.57	5.49	5.11			
19	9/9/2015	4.71	5.8	5.4			
20							
21–24							
25–28							
29–32							
33–36							
37–40							
	St.Dev. ►	0.47	0.38	0.62	#REF!	#REF!	#REF!
	Mean ►	5.75	5.63	5.95	#REF!	#REF!	#REF!
	Is the Mean greater than 3X St.Dev. ? ►	YES	YES	YES	#REF!	#REF!	#REF!

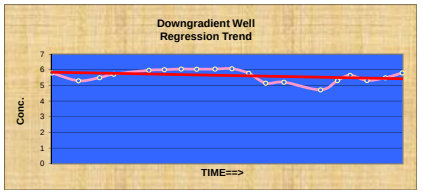
Note: The comparison of the Mean to three times the Standard Deviation may help to determine if there is a statistically significant change in the trend of a data set. If any of the cells above contain "NO", this may be an indication of a sudden increase or decrease in concentration of the parameter. This should only be used as a flag and not the basis for any final decisions regarding the acceptability of the data.

Linear Regressions:

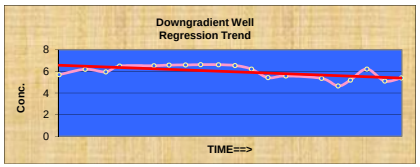
MW-1 (Upgradient Well)



MW-2



MW-3



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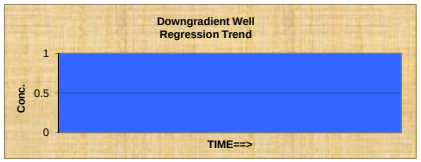

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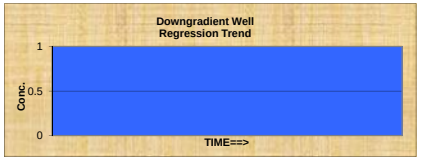

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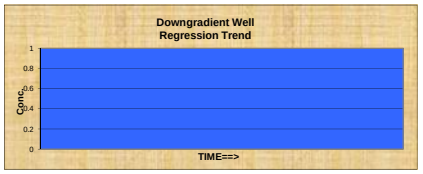

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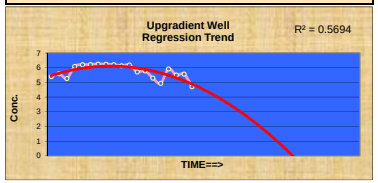

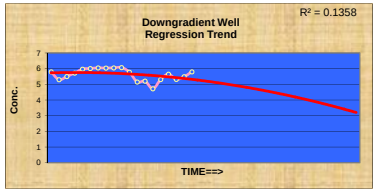

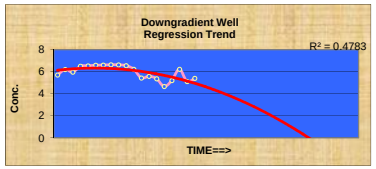

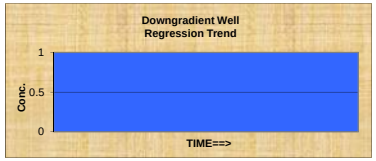

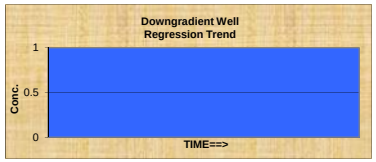

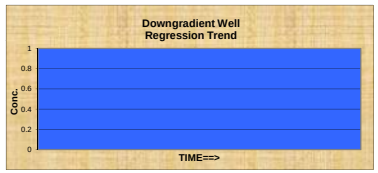

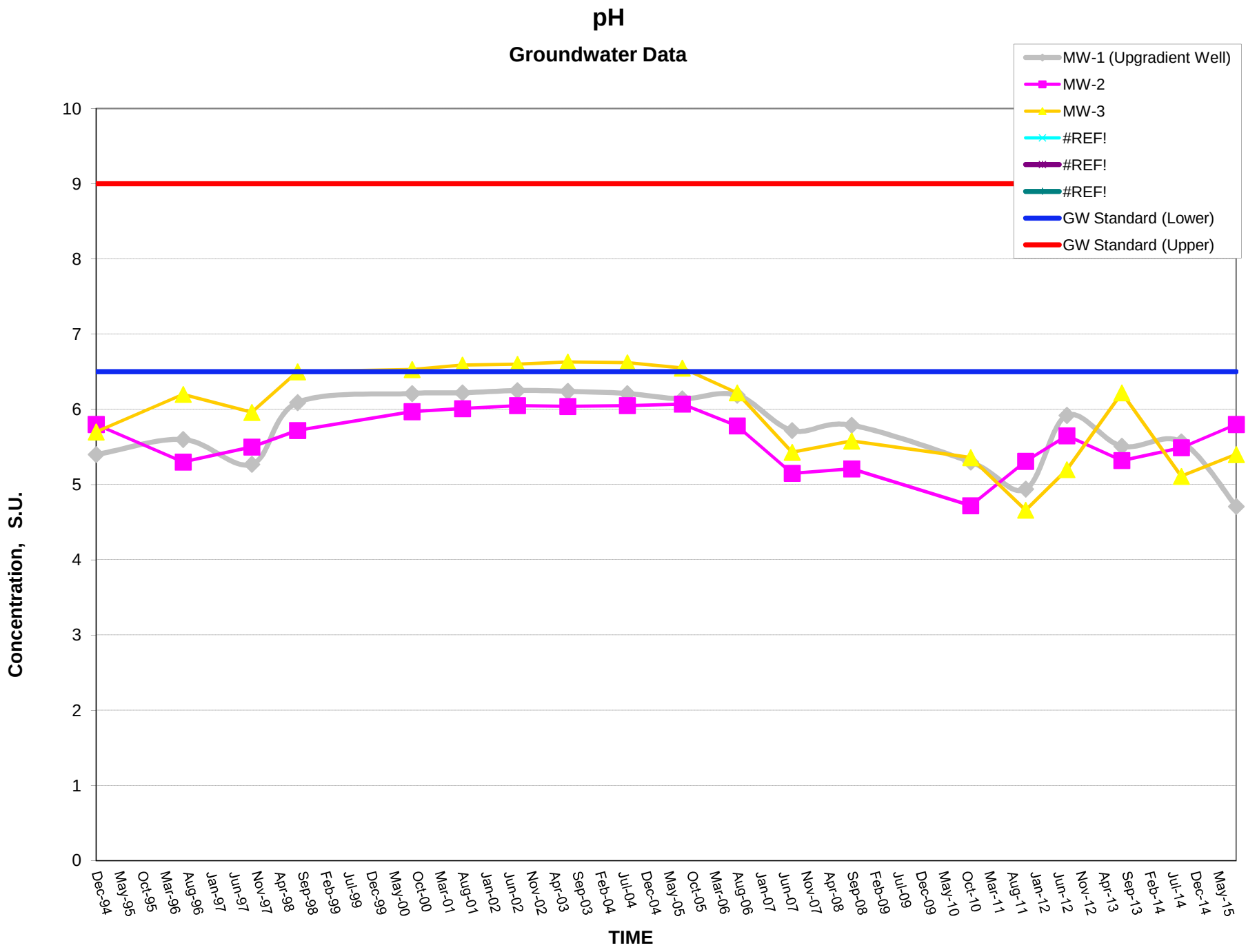
pH
Groundwater Data
MW-1 (Upgradient Well)
MW-2
MW-3
#REF!
#REF!
#REF!
GW Standard (Lower)
GW Standard (Upper)
Concentration, S.U.
10
9
8
7
6
5
4
3
2
1
0
Dec-94
May-95
Oct-95
Mar-96
Aug-96
Jan-97
Jun-97
Nov-97
Apr-98
Sep-98
Feb-99
Jul-99
Dec-99
May-00
Oct-00
Mar-01
Aug-01
Jan-02
Jun-02
Nov-02
Apr-03
Sep-03
Feb-04
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May-05
Oct-05
Mar-06
Aug-06
Jan-07
Jun-07
Nov-07
Apr-08
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Feb-09
Jul-09
Dec-09
May-10
Oct-10
Mar-11
Aug-11
Jan-12
Jun-12
Nov-12
Apr-13
Sep-13
Feb-14
Jul-14
Dec-14
May-15
TIME

	pH		MP-1

Non-Normal Test

	Upgradient Data	Downgradient Data
1	5.4	5.8
2	5.6	5.3
3	5.27	5.5
4	6.09	5.72
5	6.21	5.97
6	6.22	6.01
7	6.25	6.05
8	6.24	6.04
9	6.21	6.05
10	6.14	6.07
11	6.19	5.78
12	5.72	5.15
13	5.79	5.21
14	5.3	4.72
15	4.94	5.31
16	5.92	5.65
17	5.51	5.32
18	5.57	5.49
19	4.71	5.8
20		
21		
	Minimum 4.71	**Minimum** 4.72
	Maximum 6.25	**Maximum** 6.07

Is there a significant difference?

Lower Range	Upper Range
NO	**NO**

NO

Cochran's Approximation to the Behrens-Fisher Student's t-Test (at a 5% Level of Significance)

	Upgradient Data	Downgradient Data	$[X_b-X_b(ave)]^2$	$[X_m-X_m(ave)]^2$
1	5.4	5.8	0.123607756	0.029439335
2	5.6	5.3	0.022976177	0.107860388
3	5.27	5.5	0.231918283	0.016491967
4	6.09	5.72	0.114528809	0.008386704
5	6.21	5.97	0.210149861	0.116676177
6	6.22	6.01	0.219418283	0.145602493
7	6.25	6.05	0.248423546	0.177728809
8	6.24	6.04	0.238555125	0.16939723
9	6.21	6.05	0.210149861	0.177728809
10	6.14	6.07	0.150870914	0.194991967
11	6.19	5.78	0.192213019	0.022976177
12	5.72	5.15	0.00099723	0.228886704
13	5.79	5.21	0.001476177	0.175076177
14	5.3	4.72	0.203923546	0.825228809
15	4.94	5.31	0.658660388	0.101391967
16	5.92	5.65	0.028365651	0.000465651
17	5.51	5.32	0.058360388	0.095123546
18	5.57	5.49	0.032970914	0.019160388
19	4.71	5.8	1.084886704	0.029439335
20	0	0	0	0
21	0	0	0	0

Xb(ave)	5.751578947	Average of background data
Xm(ave)	5.6284211	Average of downgradient data
T_b =	1.734	From Lookup Table
T_m =	1.734	
s_b^2 =	0.224025146	$= [(X_{b1}-X_b(ave))^2+(X_{b2}-X_b(ave))^2...(X_{bn}-X_b(ave))^2]/(n_b-1)$
s_m^2 =	0.146780702	$= [(X_{m1}-X_m(ave))^2+(X_{m2}-X_m(ave))^2..(X_{mn}-X_m(ave))^2]/(n_m-1)$
T_{star} =	-0.881588202	= [Xm(ave)-Xb(ave)]/sqrt(sm2/nm + sb2/nb)
W_b =	0.011790797	= sb2/nb
W_m =	0.0077253	= sm2/nm
T_{comp} =	1.734	= (Wb*Tb + Wm*Tm)/(Wb + Wm)

There is no significant difference between the monitoring data and the background data or there is a failure of the assumption made for test validity

	pH		

Non-Normal Test

	Upgradient Data	Downgradient Data
1	5.4	5.7
2	5.6	6.2
3	5.27	5.96
4	6.09	6.5
5	6.21	6.53
6	6.22	6.59
7	6.25	6.6
8	6.24	6.63
9	6.21	6.62
10	6.14	6.55
11	6.19	6.22
12	5.72	5.43
13	5.79	5.58
14	5.3	5.36
15	4.94	4.66
16	5.92	5.2
17	5.51	6.22
18	5.57	5.11
19	4.71	5.4
20		
	Minimum 4.71	**Minimum** 4.66
	Maximum 6.25	**Maximum** 6.63

Is there a significant difference?

Lower Range	Upper Range
YES	**YES**

YES-Lower Range

Cochran's Approximation to the Behrens-Fisher Student's t-Test (at a 5% Level of Significance)

	Upgradient Data	Downgradient Data	$[X_b-X_b(ave)]^2$	$[X_m-X_m(ave)]^2$
1	5.4	5.7	0.123607756	0.062763435
2	5.6	6.2	0.022976177	0.062237119
3	5.27	5.96	0.231918283	8.97507E-05
4	6.09	6.5	0.114528809	0.30192133
5	6.21	6.53	0.210149861	0.335789751
6	6.22	6.59	0.219418283	0.408926593
7	6.25	6.6	0.248423546	0.421816066
8	6.24	6.63	0.238555125	0.461684488
9	6.21	6.62	0.210149861	0.448195014
10	6.14	6.55	0.150870914	0.359368698
11	6.19	6.22	0.192213019	0.072616066
12	5.72	5.43	0.00099723	0.270947645
13	5.79	5.58	0.001476177	0.137289751
14	5.3	5.36	0.203923546	0.34872133
15	4.94	4.66	0.658660388	1.665458172
16	5.92	5.2	0.028365651	0.563289751
17	5.51	6.22	0.058360388	0.072616066
18	5.57	5.11	0.032970914	0.706484488
19	4.71	5.4	1.084886704	0.303079224
20	0	0	0	0

Xb(ave) =	5.751578947	Average of background data
Xm(ave) =	5.9505263	Average of downgradient data
T_b =	1.734	From Lookup Table
T_m =	1.734	
s_b^2 =	0.224025146	$= [(X_{b1}-X_b(ave))^2+(X_{b2}-X_b(ave))^2...(X_{bn}-X_b(ave))^2]/(n_b-1)$
s_m^2 =	0.38907193	$= [(X_{m1}-X_m(ave))^2+(X_{m2}-X_m(ave))^2..(X_{mn}-X_m(ave))^2]/(n_m-1)$
T_{star} =	1.107516938	= [Xm(ave)-Xb(ave)]/sqrt(sm2/nm + sb2/nb)
W_b =	0.011790797	= sb2/nb
W_m =	0.02047747	= sm2/nm
T_{comp} =	1.734	= (Wb*Tb + Wm*Tm)/(Wb + Wm)

There is no significant difference between the

monitoring data and the background data

Groundwater Monitoring Data Analysis (v.3)

Facility Name:	Stony Creek WWTF
Permit No.:	VA0062669
Monitoring Parameter:	Specific Conductivity
Applicable GW Standard (if none leave blank):	
Applicable GW Criteria (if none leave blank):	
Concentration Units (all data):	umho/cm

	Data Entry					
Well Designation ►						
	Sample or Report Date (ascending)	Background Well Data	Compliance Well #1	Compliance Well #2	Compliance Well #3	Compliance Well #4	Compliance Well #5
1	12/14/1994	93	100	98			
2	7/31/1996	68	87	90			
3	10/20/1997	60	87	81			
4	8/10/1998	68	89	83			
5	9/25/2000	67	80	66			
6	8/27/2001	74	84	68			
7	8/15/2002	84	97	63			
8	7/22/2003	75	99	66			
9	8/10/2004	77	105	85			
10	8/22/2005	88	99	88			
11	8/15/2006	109	118	60			
12	8/23/2007	80	111	70			
13	9/22/2008	85	114	71			
14	11/9/2010	219	113	67			
15	11/14/2011	200	70	113			
16	8/13/2012	124.6	68.9	118.4			
17	8/26/2013	118.7	58.6	115.1			
18	9/24/2014	113.3	59.5	115.8			
19	9/9/2015	127	62	107			
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50							

Results: Significance to Background **

	Distribution Tests		Non-normal Test	Normal Tests	
	Shapiro-Wilk Normality Test	Shapiro-Wilk Log Normality Test	Wilcoxon Rank Sum Test	T-test	T-test (lognormal)
Background Well	Not normal	Not normal	N/A		
Compliance Well #1	Not normal	Not normal	Not Significant	Not Significant	Not Significant
Compliance Well #2	Not normal	Not normal	Not Significant	Not Significant	Not Significant
Compliance Well #3					
Compliance Well #4					
Compliance Well #5					

** Please note that the above cells will appear blank in cases where a test cannot be conducted due to lack of data, or if the test assumptions are invalid due to lack of data variation.

Results: Linear Regression Trend Analysis and Interpretation of Data

	Regression Line Slope	Pearson Correlation (R)	Interpretation	
			Linear Trend	Degree of Data Linearity
Background Well	0.011751524	0.635419733	Slight Increase	Moderately Strong
Compliance Well #1	-0.00314832	-0.385719553	Slight Decrease	Moderately Weak
Compliance Well #2	0.004023171	0.466702507	Slight Increase	Moderately Weak
Compliance Well #3				
Compliance Well #4				
Compliance Well #5				

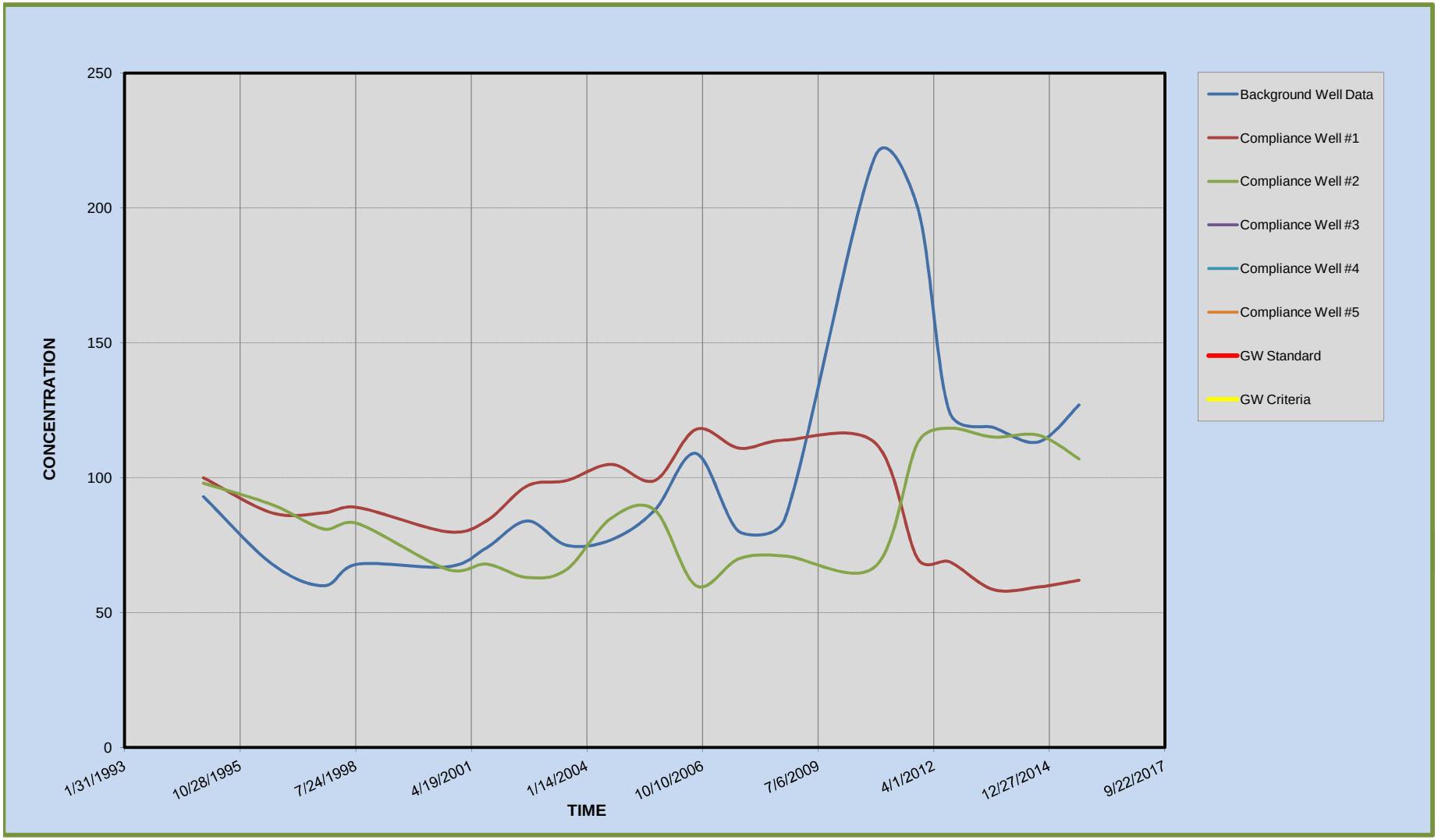
Results: Groundwater Standards/Criteria Comparison

	Groundwater Standard		Groundwater Criteria		Total No. of Data Points
	No. Violations of GW Standard	% Violations of GW Standard	No. Violations of GW Criteria	% Violations of GW Criteria	
Background Well					19
Compliance Well #1					19
Compliance Well #2					19
Compliance Well #3					
Compliance Well #4					
Compliance Well #5					

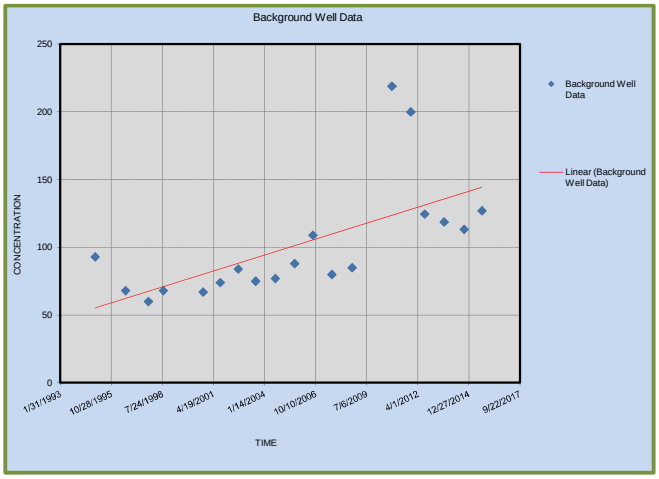
Results: Basic Statistics (less-than values ignored)

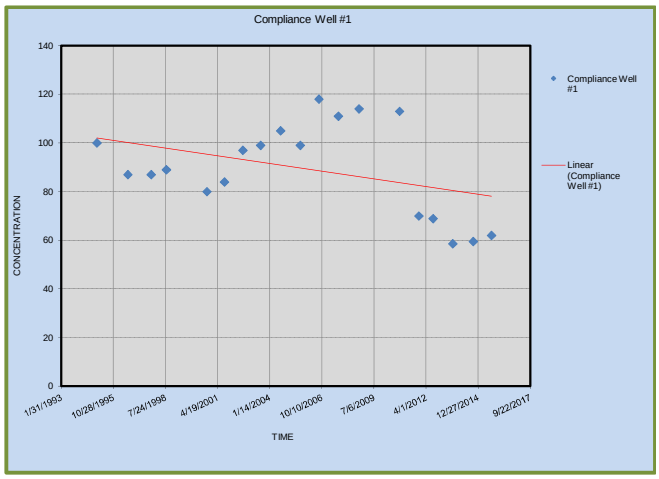
	Maximum Value	Minimum Value	Average		
Background Well	219.000	60.000	101.611		
Compliance Well #1	118.000	58.600	89.579		
Compliance Well #2	118.400	60.000	85.542		
Compliance Well #3					
Compliance Well #4					
Compliance Well #5					

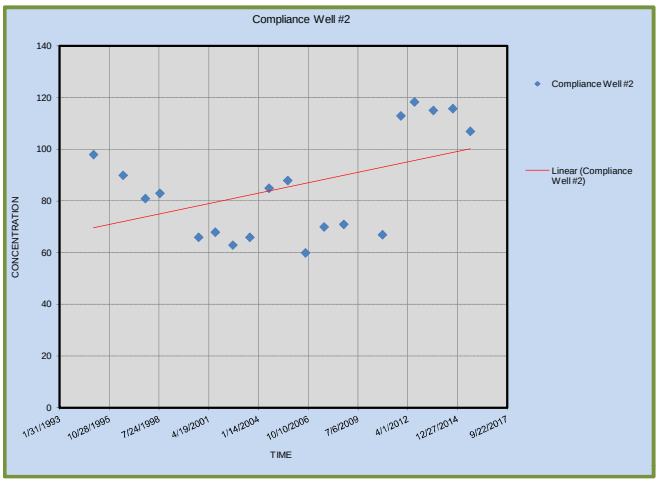
Stony Creek WWTF: Groundwater Monitoring Data for Specific Conductivity

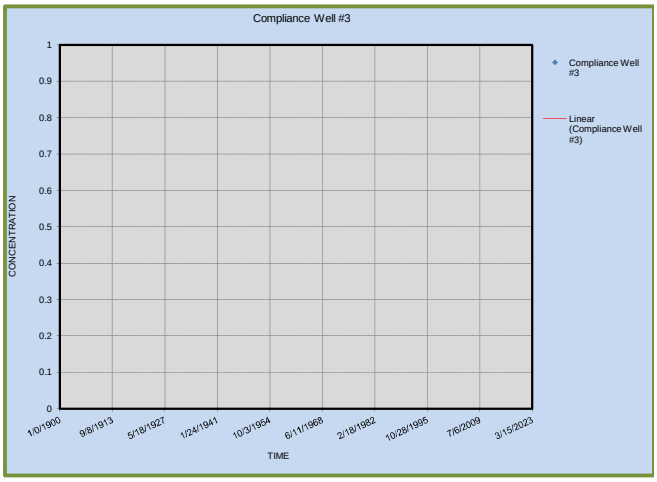


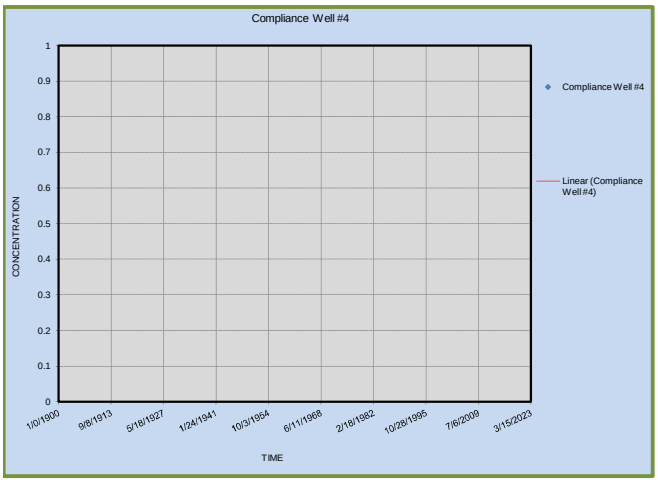
Stony Creek WWTF: Groundwater Monitoring Regression Trends for Specific Conductivity

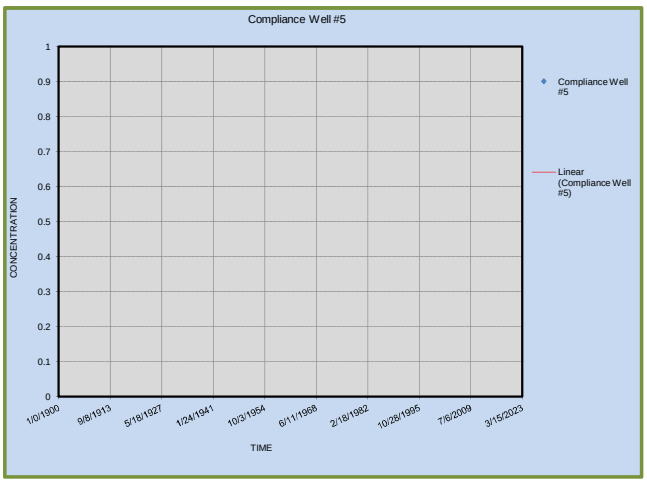












Groundwater Monitoring Data Analysis (v.3)

Facility Name:	Stony Creek WWTF
Permit No.:	VA0062669
Monitoring Parameter:	Total Organic Carbon (TOC)
Applicable GW Standard (if none leave blank):	
Applicable GW Criteria (if none leave blank):	10
Concentration Units (all data):	mg/L

	Data Entry					
Well Designation ►						
Sample or Report Date (ascending)	Background Well Data	Compliance Well #1	Compliance Well #2	Compliance Well #3	Compliance Well #4	Compliance Well #5
12/14/1994	10.4	9.6	25.2			
7/31/1996	2.3	1.6	2			
10/20/1997	2.1	0.79	0.6			
8/10/1998	1.1	1.5	0.7			
9/25/2000	3	3.3	2.5			
8/27/2001	3.4	1	1.2			
8/15/2002	1.6	0.88	0.86			
7/22/2003	1.1	0.79	0.74			
8/10/2004	1.4	1.4	1.1			
8/22/2005	0.5	0.5	0.5			
8/15/2006	1.85	1.24	0.38			
8/23/2007	1.16	1.2	0.45			
9/22/2008	1.05	0.86	0.48			
11/9/2010	4.75	0.75	0.78			
11/14/2011	3.35	0.73	0.69			
8/13/2012	1.68	0.95	0.99			
8/26/2013	1.12	0.68	0.91			
9/24/2014	1.25	0.46	0.9			
9/9/2015	1.45	0.52	0.49			

Results: Significance to Background **

	Distribution Tests		Non-normal Test	Normal Tests	
	Shapiro-Wilk Normality Test	Shapiro-Wilk Log Normality Test	Wilcoxon Rank Sum Test	T-test	T-test (lognormal)
Background Well	Not normal	Normal	N/A		
Compliance Well #1	Not normal	Not normal	Not Significant	Not Significant	Not Significant
Compliance Well #2	Not normal	Not normal	Not Significant	Not Significant	Not Significant
Compliance Well #3					
Compliance Well #4					
Compliance Well #5					

** Please note that the above cells will appear blank in cases where a test cannot be conducted due to lack of data, or if the test assumptions are invalid due to lack of data variation.

Results: Linear Regression Trend Analysis and Interpretation of Data

	Regression Line Slope	Pearson Correlation (R)	Interpretation	
			Linear Trend	Degree of Data Linearity
Background Well	-0.000363559	-0.38356881	Slight Decrease	Moderately Weak
Compliance Well #1	-0.000469274	-0.533403764	Slight Decrease	Moderately Strong
Compliance Well #2	-0.001057922	-0.442009404	Slight Decrease	Moderately Weak
Compliance Well #3				
Compliance Well #4				
Compliance Well #5				

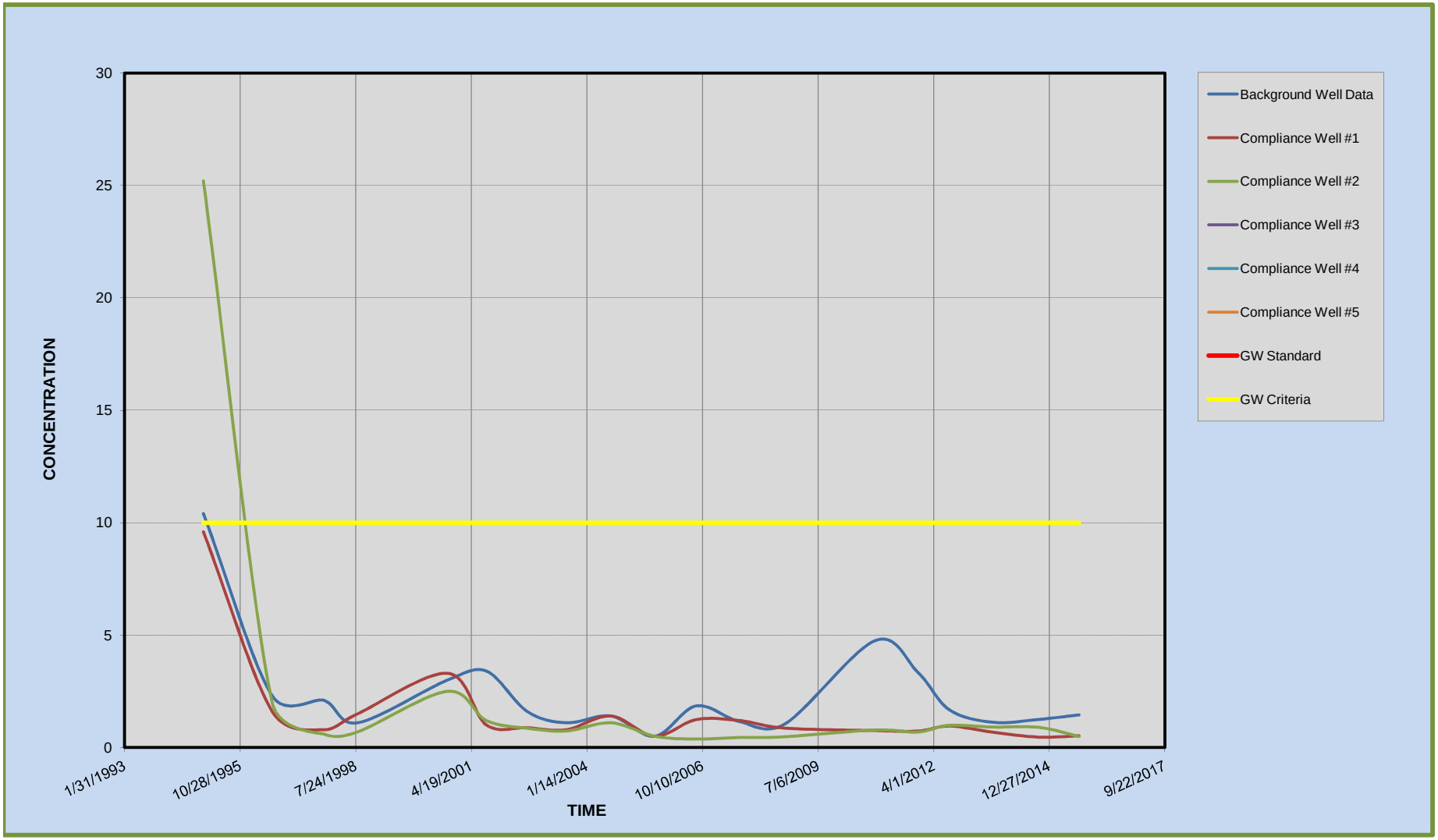
Results: Groundwater Standards/Criteria Comparison

	Groundwater Standard		Groundwater Criteria		Total No. of Data Points
	No. Violations of GW Standard	% Violations of GW Standard	No. Violations of GW Criteria	% Violations of GW Criteria	
Background Well			1	5.3%	19
Compliance Well #1			0	0%	19
Compliance Well #2			1	5.3%	19
Compliance Well #3					
Compliance Well #4					
Compliance Well #5					

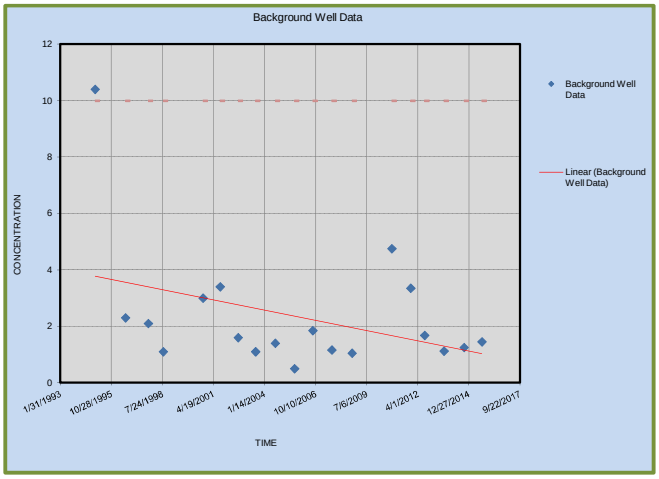
Results: Basic Statistics (less-than values ignored)

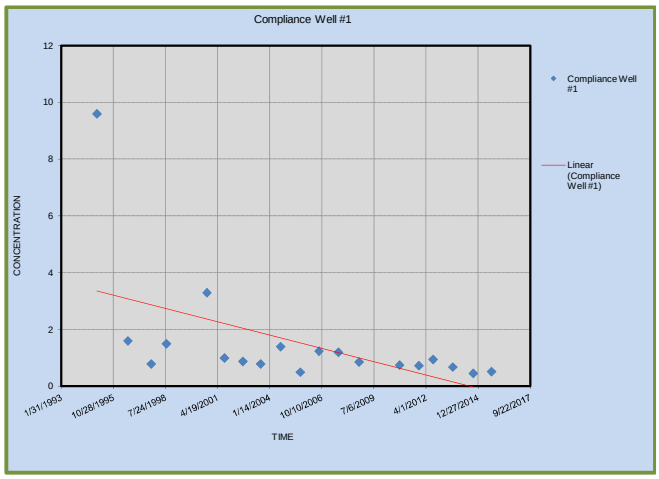
	Maximum Value	Minimum Value	Average		
Background Well	10.400	0.500	2.345		
Compliance Well #1	9.600	0.460	1.513		
Compliance Well #2	25.200	0.380	2.183		
Compliance Well #3					
Compliance Well #4					
Compliance Well #5					

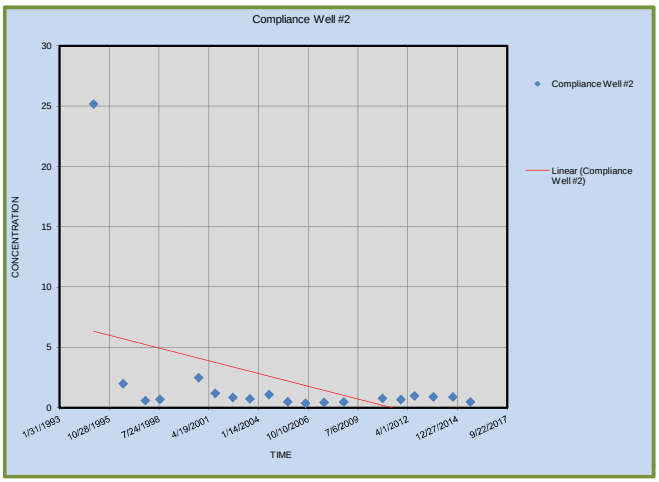
Stony Creek WWTF: Groundwater Monitoring Data for Total Organic Carbon (TOC)

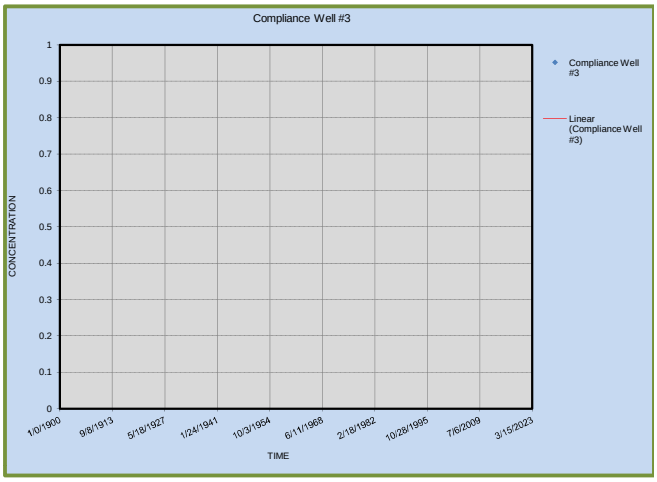


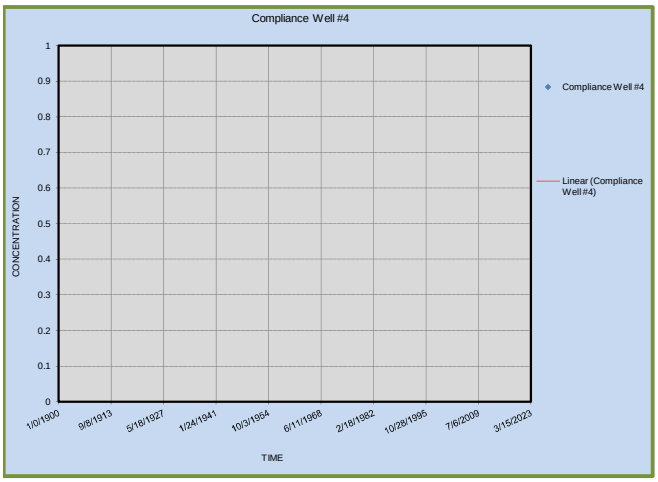
Stony Creek WWTF: Groundwater Monitoring Regression Trends for Total Organic Carbon (TOC)

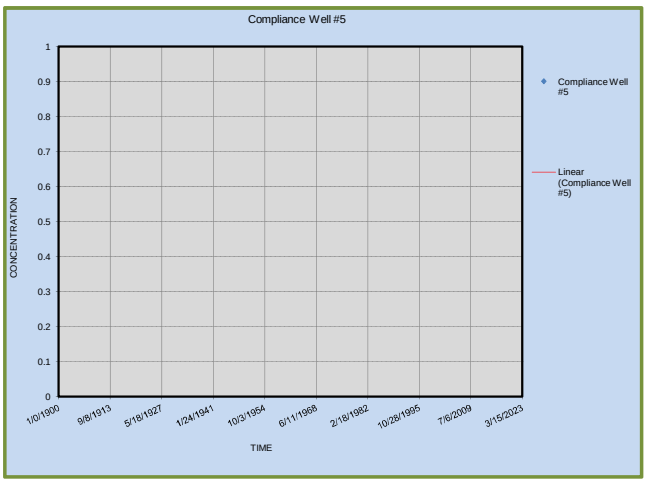












Attachment G – 2016 Site Visit Report

MEMORANDUM

DEPARTMENT OF ENVIRONMENTAL QUALITY
Piedmont Regional Office

4949-A Cox Rd Glen Allen, VA 23060 (804) 527-5046

SUBJECT: Site Visit

TO: File

FROM: Adam Eller, PRO

DATE: March 27, 2016

COPIES: File

Facility Name: Stony Creek Wastewater Treatment Facility
Permit Number: VA0062669

On March 24, 2016 a site visit was performed at the Stony Creek Wastewater Treatment Facility (WWTF), which is located at 12521 Setzer Road in Stony Creek, VA. The facility is owned and operated by the Sussex Service Authority (SSA). The purpose of the site visit was to confirm the accuracy of application information and to ensure that the reissued permit contains all appropriate conditions. Attendees included Adam Eller (DEQ-PRO), Mike Kearns (Engineer/Deputy Director, SSA), Frank Irving (Executive Director, SSA), Robert Magette (Operation Manager, SSA), and Susan Brickhouse (Board Member, Town of Stony Creek).

The appearance of the grounds at the facility indicated that there is consistent maintenance, and it appeared clean and organized. There is a perimeter fence surrounding the entire facility, which has a lockable gate for safety/security purposes. The facility's lawn and other vegetation around the site appeared adequately groomed.

The facility has a design capacity of 40,000 GPD. As wastewater enters the treatment works, it is first screened to remove grit and larger debris. Grit screenings are removed daily (manually) and the solids are hauled to Black Swamp WWTF for final disposal to Atlantic Waste Landfill with other collected solids (in accordance with the facility's sludge management plan).

The existing treatment includes two 1 MG lagoons that operate in series. The hydraulic retention time is estimated to be 21.8 days in each lagoon when an average daily flow rate of 0.05 MGD is assumed. Each lagoon is approximately 228 feet long by 123 feet wide. There are large floatable mechanical aerators in each lagoon (six aerators in Lagoon #1 and two aerators in Lagoon #2). The lagoons are followed by chlorination and dechlorination units, cascade steps and active post-aeration treatment. A mobile generator is stored off-site by SSA, which is available in the event of loss of electrical power.

At the time of the site visit, three aerators were active in Lagoon #1 and one aerator was active in Lagoon #2 at the time of the site visit. Mr. Magette stated that the facility has shown marked improvement in effluent quality (e.g. higher DO levels), even without all aerators turned on. Typically, three of the eight aerators are running continuously at any given time; however, the other five aerators are also turned on as needed, in a balanced manner so as to both comply with the permit limitations and to conserve energy.

Lagoon sludge depth is checked and recorded approximately twice per year. Mr. Magette confirmed that the sludge has never had to be removed from either of the lagoons; however, in the event that sludge must be removed, the sludge would be pumped and hauled to the Black Swamp WWTF for centrifuge dewatering and disposal to Atlantic Waste Landfill (also in accordance with the facility's sludge management plan). Current sludge depth varies, depending on lagoon section, but the overall average depth is estimated to be roughly six inches.

Partially treated wastewater enters Lagoon #2 from Lagoon #1 via a shallow underground pipe. Lagoon #2 contains two large floatable aerators. A baffle wall is also located at the end of Lagoon #2 (nearest to the control building) to aide in suspended solids removal.

Following Lagoon #2, there is a four-tube tablet chlorinator (two tubes in use at time of visit), a four-tube tablet de-chlorinator (all four tubes in use at time of visit), cascade steps for passive post-aeration followed by a small submersed blower for active post-aeration.

The facility discharges directly to Stony Creek via Outfall 001. Outfall 001 is accessible from Setzer and Smith concrete casting company's adjacent property and is located approximately 1,000 feet South-southwest of the Stony Creek WWTF. The treated effluent was sufficiently clear (clear to light beige) and without any detectable odor, foam, or visible debris.

Figure 1: Grit screenings removal unit

Figure 2: Mechanical aerators in Lagoon #1

Figure 3: Lagoon #1 and control building

Figure 4: Lagoon #2 (pumps in housing above are not in use)

Figure 5: Mechanical aerator in Lagoon #2

Figure 6: Baffle wall in Lagoon #2

Figure 7: 4-tube tablet chlorinator unit

Figure 8: 4-tube tablet dechlorinator unit

Figure 7: Cascade steps/post aeration

Figure 9: Chlorination and dechlorination tablets stored in original containers next to disinfection area

Figure 8: V-notch weir and cascade steps

Figure 9: Outfall 001 in Stony Creek

Attachment H – VDH Comments

COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY
PIEDMONT REGIONAL OFFICE
4949A Cox Road, Glen Allen, Virginia 23060
(804) 527-5020 Fax (804) 527-5106
www.deq.virginia.gov

Molly Joseph Ward
Secretary of Natural Resources

David K. Paylor
Director

Michael P. Murphy
Regional Director

October 29, 2015

Virginia Department of Health
Office of Drinking Water
Southeast Regional Office
830 Southampton Avenue
Rm. 2058
Norfolk, VA 23510
Submitted electronically: Daniel.Horne@vdh.virginia.gov

RE: VPDES Permit No. VA0062669 - Stony Creek Wastewater Treatment Plant; 12521 Setzer Road, Stony Creek, VA 23882 (in Sussex County): Permit Reissuance (with a design flow expansion from 0.040 MGD to 0.060 MGD)

Dear Mr. Horne:

Documentation supporting reissuance of the referenced VPDES permit application is posted at http://www.deq.virginia.gov/fileshare/wps/ for your review and concurrence. Please note that the applicant has requested that the facility's permitted design capacity be increased from 0.040 MGD to 0.060 MGD. Please submit a response to this office within 14 days with your comments or objections or a statement verifying that the Virginia Department of Health has no comments on the VPDES permit application.

Sincerely,

Adam C. Eller
Environmental Specialist II
Adam.Eller@deq.virginia.gov
Phone: (804)527-5046
Fax: (804)527-5106

Cc: FILE

RECEIVED PRO
NOV 20 2015

COMMONWEALTH of VIRGINIA

Marissa J. Levine, MD, MPH, FAAFP
State Health Commissioner

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

DEPARTMENT OF HEALTH
OFFICE OF DRINKING WATER
Southeast Virginia Field Office

830 Southampton Avenue
Suite 2058
Norfolk, VA 23510
Phone (757) 683-2000
Fax (757) 683-2007

DATE: NOV 13 2015

FROM: DBH Daniel B. Horne, PE
Engineering Field Director

TO: Mr. Adam C. Eller, Environmental Specialist II
DEQ Piedmont Regional Office
4949-A Cox Road
Glen Allen, Virginia 23060

CITY/COUNTY: SUSSEX COUNTY
APPLICANT: Sussex Service Authority
PERMIT TYPE: VPDES
APPLICATION TYPE: Re-Issuance (Existing)
PROJECT: Stony Creek Wastewater Plant

SUBJECT: Review response for DEQ's permit application #VA 0062669

Our office has reviewed the application for reissuance of a permit to discharge an average of 0.06 MGD of treated wastewater in to the Nottoway River near Stony Creek, Virginia.

One public raw water intake in Virginia, for the City of Norfolk Waterworks, was found 53.4 miles downstream from the discharge point/area. Since this is greater than 5 miles, we find no impact from this discharge on this intake.

JWW/DBH/kcb

pc: Ms. Kristen M. Lentz, PE, Director of Utilities, City of Norfolk
Sussex Service Authority
VDH-ODW, Central Office
VDH, Sussex County Health Department

R:\DIST19\Sussex\Stony Creek\DEQ Review Response - Stony Creek Wastewater Plant.docx

Attachment I – Threatened and Endangered Species Coordination (Including VaFWIS Search Report and Comments from DCR, DGIF and USFWS)

VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY	**VPDES PERMITS** **Threatened and Endangered Species Coordination**
To: ☒ DGIF, Environmental Review Coordinator ☒ DCR ☒ USFWS, T/E Review Coordinator **From:** Adam Eller, VPDES Permit Writer, DEQ-PRO	**Date Sent:** 11/24/2015 **Permit Number:** VA0062669
Facility Name: Stony Creek Wastewater Treatment Facility **Contact:** Michael P. Kearns, Deputy Director, Sussex Service Authority **Phone:** (804) 834-8930 **Address:** 4385 Beef Steak Road, Waverly, VA 23890	**Location:** 12521 Setzer Road, Stony Creek, VA 23882 **USGS Quadrangle:** Stony Creek Quadrangle 039B **Latitude/Longitude:** 36◦ 56’ 56” / -77◦ 23’ 25” **Receiving Stream:** Stony Creek **Receiving Stream Flow Statistics used for Permit:** 1Q10 = 0.36 cfs (0.23 MGD) 1Q30 = 0.16 cfs (0.10 MGD) 7Q10 = 0.43 cfs (0.28 MGD) 30Q5 = 2.4 cfs (1.5 MGD) 30Q10 = 1.1 cfs (0.72 MGD) High Flow 1Q10 = 23 cfs (15 MGD) High Flow 7Q10 = 30 cfs (19 MGD) High Flow 30Q10 = 55 cfs (35 MGD) HM = undefined
Effluent Characteristics and Max Daily Flow: ***See Attachment A***	**Species Search Results (or attach database report and map):** ***See Attachment C***

Attach draft permit effluent limits page if available or attach existing effluent limits page (make sure it is clear in your email which one it is – draft current or existing). ***See Attachment B***

DGIF email: Gladys.Cason@dgif.virginia.gov
USFWS email: margaret_byrne@fws.gov
DCR: If Natural Heritage Data Explorer (NHDE) has the needed information DCR does not need this form. If you have additional information you wish to add, you may do so in the comments field on the NHDE form. DCR will contact you directly if they need more information.

Attachment A:
Stony Creek WWTF Effluent Characteristics and Max Daily Flow
(Please note that the wastewater treatment plant's current design capacity is 0.040 MGD, however, the permittee has also applied for an expanded design capacity tier of 0.060 MGD to be included in the reissued permit)

Discharge Description

OUTFALL NUMBER	DISCHARGE SOURCE	TREATMENT	FLOW
001	Residential and commercial	Mechanical screening, two-stage aerated lagoon, filtration, chlorination, dechlorination, cascade step aeration	0.040 MGD

Nature of operations generating wastewater: Residential homes, two hotels, travel plaza and five restaurants. Approximately 90% of flow is from domestic sources and 10% of flow is from non-domestic connections/sources.

Effluent sample results reported on 2015 VPDES application:

Outfall number: 001

PARAMETER	MAXIMUM DAILY VALUE		AVERAGE DAILY VALUE		
	Value	Units	Value	Units	Number of Samples
pH (Minimum)	7.76	s.u.			
pH (Maximum)	8.27	s.u.			
Flow Rate	0.0377	MGD	0.0330	MGD	11
Temperature (Winter)	14.3	degrees C	8.8	degrees C	5
Temperature (Summer)	28.3	degrees C	24.9	degrees C	6

* For pH please report a minimum and a maximum daily value

POLLUTANT		MAXIMUM DAILY DISCHARGE		AVERAGE DAILY DISCHARGE			ANALYTICAL METHOD	ML / MDL
		Conc.	Units	Conc.	Units	Number of Samples		
CONVENTIONAL AND NONCONVENTIONAL COMPOUNDS.								
BIOCHEMICAL OXYGEN	BOD-5	36	mg/l	17.82	mg/l	11	5210B	2.0
DEMAND (Report one)	CBOD-5		mg/l		mg/l		5201B	
FECAL COLIFORM		13.0	MPN100ml	2.73	MPN100m	11	9221C&E	2.0
TOTAL SUSPENDED SOLIDS (TSS)		36	mg/l	17.15	mg/l	11	2540D	1.0

Attachment B:
Existing Effluent Limitations in 2011-2016 VPDES permit:

A. Effluent Limitations and Monitoring Requirements

1. During the period beginning with the permit's effective date and lasting until the permit's expiration date the permittee is authorized to discharge from outfall number 001. This discharge shall be limited and monitored as specified below:

EFFLUENT CHARACTERISTICS	DISCHARGE LIMITS						MONITORING REQUIREMENTS	
	MONTHLY AVERAGE		WEEKLY AVERAGE		MINIMUM	MAXIMUM	FREQUENCY	SAMPLE TYPE
001 Flow (MGD)	NL		NA		NA	NL	1/Day	Estimate
002 pH (standard units)	NA		NA		6.0	9.0	1/Day [b]	Grab
003 BOD_5 [c]	30 mg/l	4500 g/d	45 mg/l	6800 g/d	NA	NA	1/Month [b]	Grab
004 Total Suspended Solids [c]	30 mg/l	4500 g/d	45 mg/l	6800 g/d	NA	NA	1/Month [b]	Grab
005 Total Residual Chlorine [a]	0.064 mg/l		0.079 mg/l		NA	NA	1/Day [b]	Grab
007 Dissolved Oxygen	NA		NA		5.5 mg/l	NA	1/Day [b]	Grab
120 *E. coli* (N/100ml)	NL		NA		NA	NA	4/Month (10am-4pm)	Grab

a. See Part I.B.1 for additional TRC limits that apply at the outlet of each chlorine contact tank.
b. Effluent samples shall be collected after post-aeration.
c. The limitation is expressed in two significant figures.

NL = No Limitation; monitoring and reporting are required
NA = Not Applicable

2. The design flow of this treatment facility is 0.040 MGD. See Part I.C.1 for additional requirements.
3. There shall be no discharge of floating solids or visible foam in other than trace amounts.
4. At least 85% removal for BOD_5 and TSS must be attained for this effluent.

Attachment C:
VAFWIS Search Report

VaFWIS Search Report Compiled on 11/24/2015, 2:51:18 PM
within taxa **Fish, Amphibians, Reptiles, Aquatic Molluscs, Aquatic Crustaceans, Aquatic Insects, Other Aquatic Invertebrate Taxa, Marine Mammals**
Known or likely to occur within a **2 mile radius around point 36,56,56.0 -77,23,25.0**
in **183 Sussex County, VA**

View Map of Site Location

200 Known or Likely Species ordered by Status Concern for Conservation
(displaying first 20) (14 species with Status* or Tier I** or Tier II**)

BOVA Code	Status*	Tier**	Common Name	Scientific Name	Confirmed	Database(s)
010214	FESE	I	Logperch, Roanoke	Percina rex	Yes	BOVA,SppObs,TEWaters,Habitat,HU6
060003	FESE	II	Wedgemussel, dwarf	Alasmidonta heterodon	Yes	BOVA,SppObs,TEWaters,Habitat,HU6
010347	SE	I	Sunfish, blackbanded	Enneacanthus chaetodon	Potential	BOVA,Habitat,HU6
020044	ST	II	Salamander, Mabee's	Ambystoma mabeei	Potential	BOVA,Habitat
020002	ST	II	Treefrog, barking	Hyla gratiosa		BOVA
060173	FSST	II	Pigtoe, Atlantic	Fusconaia masoni	Yes	TEWaters,Habitat
060175	FS	II	Slabshell, Roanoke	Elliptio roanokensis	Potential	Habitat,HU6
060029	FS	III	Lance, yellow	Elliptio lanceolata		BOVA,HU6
070105	FS	III	Crayfish, Chowanoke	Orconectes virginiensis		BOVA,HU6
010038	FS	IV	Alewife	Alosa pseudoharengus		BOVA,HU6
030063	CC	III	Turtle, spotted	Clemmys guttata		BOVA,HU6
010077		I	Shiner, bridle	Notropis bifrenatus	Yes	BOVA,SppObs,Habitat
010174		II	Bass, Roanoke	Ambloplites cavifrons	Yes	BOVA,SppObs,Habitat,HU6
020063		II	Toad, oak	Anaxyrus quercicus	Potential	BOVA,Habitat
020005		III	Frog, carpenter	Lithobates virgatipes		BOVA
020082		III	Siren, eastern lesser	Siren intermedia intermedia		BOVA
020022		III	Waterdog, dwarf	Necturus punctatus	Yes	BOVA,SppObs,HU6
030068		III	Turtle,	Terrapene		BOVA,HU6

			woodland box	carolina carolina		
060071		III	Lampmussel, yellow	Lampsilis cariosa		HU6
060145		III	Rainbow, Notched	Villosa constricta		BOVA,HU6

To view **All 200 species** View 200

* FE=Federal Endangered; FT=Federal Threatened; SE=State Endangered; ST=State Threatened; FC=Federal Candidate; FS=Federal Species of Concern; CC=Collection Concern

** I=VA Wildlife Action Plan - Tier I - Critical Conservation Need; II=VA Wildlife Action Plan - Tier II - Very High Conservation Need; III=VA Wildlife Action Plan - Tier III - High Conservation Need; IV=VA Wildlife Action Plan - Tier IV - Moderate Conservation Need

Anadromous Fish Use Streams

(2 records)

View Map of All Anadromous Fish Use Streams

Stream ID	Stream Name	Reach Status	Anadromous Fish Species			View Map
			Different Species	Highest TE*	Highest Tier**	
C55	Nottoway River	Confirmed	4	FC	IV	Yes
C95	Stony Creek	Confirmed	1			Yes

Impediments to Fish Passage

N/A

Colonial Water Bird Survey

N/A

Threatened and Endangered Waters

(2 Reaches)

View Map of All Threatened and Endangered Waters

Stream Name	T&E Waters Species						View Map
	Highest TE*	BOVA Code, Status*, Tier**, Common & Scientific Name					
Nottoway River (03010201)	FESE	010214	FESE	I	Logperch, Roanoke	Percina rex	Yes
		060003	FESE	II	Wedgemussel, dwarf	Alasmidonta heterodon	
		060173	FSST	II	Pigtoe, Atlantic	Fusconaia masoni	
Stony Creek (03010201)	FESE	010214	FESE	I	Logperch, Roanoke	Percina rex	Yes
		060173	FSST	II	Pigtoe, Atlantic	Fusconaia masoni	

Managed Trout Streams

N/A

Species Observations

(67 records - displaying first 20 , 15 Observations with Threatened or Endangered species)

View Map of All Query Results
Species Observations

obsID	class	Date Observed	Observer	N Species			View Map
				Different Species	Highest TE*	Highest Tier**	
621819	SppObs	Sep 18 2013	Wayne; Starnes	11	FESE	I	Yes
318674	SppObs	Aug 20 2007	Ricky Davis	1	FESE	I	Yes
64346	SppObs	Aug 1 2000	PAUL L. ANGERMEIER (PRINCIPLE PERMITTEE), VARIOUS COLLECTORS	14	FESE	I	Yes
58012	SppObs	Aug 4 1998	PAUL ANGERMEIER (PRINCIPLE PERMITTEE) AND AMANDA ROSENBERGER, VIRGINIA POLYTECHNICAL INSTITUTE	14	FESE	I	Yes
58011	SppObs	Aug 3 1998	PAUL ANGERMEIER (PRINCIPLE PERMITTEE) AND AMANDA ROSENBERGER, VIRGINIA POLYTECHNICAL INSTITUTE	13	FESE	I	Yes
50401	SppObs	Jun 19 1996	P. L. Angermeier, VPI& SU	19	FESE	I	Yes
8642	SppObs	Oct 13 1994	GREG GARMAN, VCU	2	FESE	I	Yes
6565	SppObs	Oct 13 1994	Greg Garman, VCU	2	FESE	I	Yes
322396	SppObs	Sep 10 1986	M. Norman; R. Southwick; H. Ranney; D. Martin; Greg Garman; Mark King; P. Angelmeirer; T. Simeonson	17	FESE	I	Yes
10348	SppObs	May 14 1982	Norman	25	FESE	I	Yes
337482	SppObs	Jan 1 1982	MDN-B-NORMAN	25	FESE	I	Yes
15418	SppObs	Oct 2 1970	MILLSAPS	15	FESE	I	Yes
10414	SppObs	Oct 26 1966	Woolcott	19	FESE	I	Yes
55745	SppObs	Jul 11 1996	NEVES, DOROSHEFF, VAUGHAN, JONES, YANG, VIRGINIA COOPERATIVE FISH AND WILDLIFE RESEARCH UNIT	5	FESE	II	Yes
62912	SppObs	Jul 11 1996	Neves, Vaughan, Dorosheff, Jones, Yang	5	FESE	II	Yes
15422	SppObs	Jun 26 1968	WOOLCOTT	14		I	Yes
15421	SppObs	Apr 25	WOOLCOTT	13		I	Yes

		1968					
10395	SppObs	Sep 30 1967	Zorach	21		I	Yes
15419	SppObs	Sep 29 1967	WOOLCOTT	13		I	Yes
609699	SppObs	Sep 1 2010	Wayne; Starnes	13		II	Yes

Displayed 20 Species Observations

Selected 67 Observations View all 67 Species Observations

Habitat Predicted for Aquatic WAP Tier I & II Species

(5 Reaches)

View Map Combined Reaches from Below of Habitat Predicted for WAP Tier I & II Aquatic Species

Stream Name	Tier Species						View Map
	Highest TE*	BOVA Code, Status*, Tier**, Common & Scientific Name					
Nottoway River (03010201)	FESE	010174		II	Bass, Roanoke	Ambloplites cavifrons	Yes
		010214	FESE	I	Logperch, Roanoke	Percina rex	
		060003	FESE	II	Wedgemussel, dwarf	Alasmidonta heterodon	
		060173	FSST	II	Pigtoe, Atlantic	Fusconaia masoni	
		060175	FS	II	Slabshell, Roanoke	Elliptio roanokensis	
Southwest Swamp (03010201)	FESE	010214	FESE	I	Logperch, Roanoke	Percina rex	Yes
		060003	FESE	II	Wedgemussel, dwarf	Alasmidonta heterodon	
Stony Creek (03010201)	FESE	010077		I	Shiner, bridle	Notropis bifrenatus	Yes
		010174		II	Bass, Roanoke	Ambloplites cavifrons	
		010214	FESE	I	Logperch, Roanoke	Percina rex	
		060003	FESE	II	Wedgemussel, dwarf	Alasmidonta heterodon	
		060173	FSST	II	Pigtoe, Atlantic	Fusconaia masoni	
Stony Creek (03010201)	FESE	010174		II	Bass, Roanoke	Ambloplites cavifrons	Yes
		010214	FESE	I	Logperch, Roanoke	Percina rex	
		060003	FESE	II	Wedgemussel,	Alasmidonta	

					dwarf	heterodon	
		060173	FSST	II	Pigtoe, Atlantic	Fusconaia masoni	
(03010201)	SE	010347	SE	I	Sunfish, blackbanded	Enneacanthus chaetodon	Yes

Habitat Predicted for Terrestrial WAP Tier I & II Species

(2 Species)

View Map of Combined Terrestrial Habitat Predicted for 2 WAP Tier I & II Species Listed Below

ordered by Status Concern for Conservation

BOVA Code	Status*	Tier**	Common Name	Scientific Name	View Map
020044	ST	II	Salamander, Mabee's	Ambystoma mabeei	Yes
020063		II	Toad, oak	Anaxyrus quercicus	Yes

Virginia Breeding Bird Atlas Blocks

N/A

Compiled on 11/24/2015, 2:51:27 PM I693739.0 report=Options searchType= R dist= 3218 poi= 36,56,56.0 -77,23,25.0 siteDD= null

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Archived: Monday, March 28, 2016 11:28:09 AM
From: Eller, Adam (DEQ)
Sent: Wednesday, March 23, 2016 6:07:00 PM
To: ProjectReview (DGIF)
Cc: 'nhreview@dcr.virginia.gov'; 'troy_andersen@fws.gov'; Susan_Lingenfelser@fws.gov
Subject: RE: ESSLog 36273; DEQ, VPDES Permit #VA0062669, T & E coordination for Stony Creek Wastewater Treatment Facility in Sussex County, VA
Importance: Normal

Mr. Aschenbach,

Thank you for your comments on this proposed permit action.

Chlorination is currently the disinfection method used at the existing 0.040 MGD treatment works; the effluent is dechlorinated prior to discharge to meet its VPDES permit limitations for total residual chlorine and to comply with Virginia's State Water Quality Standards (9VAC25-260 et. seq). DEQ does not dictate that a particular form of disinfection be used provided that the final effluent complies with the VPDES regulations and is in conformance with applicable Water Quality Standards; however, I will convey your recommendation of incorporating UV disinfection to the permittee to consider for future expansions and/or upgrades to the treatment works.

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 permit action 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 May 2016.

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. If you have additional recommendations on this proposed permit action or wish to discuss anything further, please feel free to contact me.

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

Sincerely,

Adam Eller
Environmental Specialist II

Department of Environmental Quality
Piedmont Regional Office
4949-A Cox Road
Glen Allen, VA 23060
Phone: (804) 527-5046
Fax: (804) 527-5106
Email: adam.eller@deq.virginia.gov
Website: www.deq.virginia.gov

From: ProjectReview (DGIF)
Sent: Friday, March 18, 2016 2:26 PM
To: Eller, Adam (DEQ); 'nhreview@dcr.virginia.gov'; 'troy_andersen@fws.gov'; Susan_Lingenfelser@fws.gov
Cc: ProjectReview (DGIF)
Subject: ESSLog 36273; DEQ, VPDES Permit #VA0062669, T & E coordination for Stony Creek Wastewater Treatment Facility in Sussex County, VA
Importance: High

According to our records, the receiving reach of Stony Creek is a headwater tributary to the Nottoway River, both are designated threatened and endangered (T&E) species waters for the federal Endangered state Endangered (FESE) Roanoke logperch, FESE dwarf wedgemussel, and state Threatened (ST) Atlantic pigtoe.

We reiterate our ongoing recommendation to use ultraviolet (UV) disinfection (rather than chlorination disinfection), if practicable. If chlorination becomes necessary and is used, we recommend dechlorination, prior to discharge. 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). Therefore, we recommend the EPA values being implemented in this permit for this and all future VPDES permits, if practicable. Provided adherence to the effluent characteristics and permit conditions, we do not anticipate the reissuance of this permit to result in adverse impact to resources under our purview.

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.

Thanks.

Ernie Aschenbach
Environmental Services Biologist
Virginia Dept. of Game and Inland Fisheries
Phone: (804) 367-2733
Email: Ernie.Aschenbach@dgif.virginia.gov

We moved! Our new address is:

Physical
7870 Villa Park Dr, Suite 400
Henrico, VA 23228

Mailing
P O Box 90778
Henrico, VA 23228

Archived: Wednesday, March 16, 2016 5:07:16 PM
From: ProjectReview (DGIF)
Sent: Wednesday, March 16, 2016 4:35:37 PM
To: Eller, Adam (DEQ)
Cc: ProjectReview (DGIF)
Subject: ESSLog 36273; DEQ, VPDES Permit #VA0062669, T & E coordination for Stony Creek Wastewater Treatment Facility in Sussex County, VA
Importance: Normal

ESSLog 36273; DEQ, VPDES Permit #VA0062669, T & E coordination for Stony Creek Wastewater Treatment Facility in Sussex County, VA

Sorry, this was lost in the staff-retirement backlog. I will review and provide comments this week. Thanks.

Ernie Aschenbach
Environmental Services Biologist
Virginia Dept. of Game and Inland Fisheries
Phone: (804) 367-2733
Email: Ernie.Aschenbach@dgif.virginia.gov

We moved! Our new address is:

Physical
7870 Villa Park Dr, Suite 400
Henrico, VA 23228

Mailing
P O Box 90778
Henrico, VA 23228

From: Eller, Adam (DEQ)
Sent: Wednesday, March 16, 2016 1:43 PM
To: ProjectReview (DGIF)
Subject: FW: TE Coordination Needed: VPDES No. VA0062669 Stony Creek WWTF
Importance: High

Please see the previous correspondence to DGIF. I have not received a response from DGIF, so please confirm that there are no comments on the proposed permit action.

Respectfully,

Adam Eller
Environmental Specialist II

Department of Environmental Quality
Piedmont Regional Office
4949-A Cox Road
Glen Allen, VA 23060
Phone: (804) 527-5046
Fax: (804) 527-5106
Email: adam.eller@deq.virginia.gov
Website: www.deq.virginia.gov

From: Eller, Adam (DEQ)
Sent: Tuesday, January 12, 2016 5:11 PM
To: ProjectReview (DGIF)
Subject: FW: TE Coordination Needed: VPDES No. VA0062669 Stony Creek WWTF
Importance: High

To whom it may concern:
Please see the attached form requesting T&E coordination for the proposed reissuance and expansion of Stony Creek Wastewater Treatment Plant (VPDES No. VA0092525). It appears that the previous 11/24/15 email to Gladys was not delivered.

Please contact me if there are any questions about the proposed VPDES permit reissuance.

Sincerely,
Adam Eller
Environmental Specialist II
Department of Environmental Quality
Piedmont Regional Office
4949-A Cox Road
Glen Allen, VA 23060
Phone: (804) 527-5046
Fax: (804) 527-5106
Email: adam.eller@deq.virginia.gov
Website: www.deq.virginia.gov

From: Eller, Adam (DEQ)
Sent: Tuesday, November 24, 2015 4:56 PM
To: 'Gladys.Cason@dgif.virginia.gov'
Subject: TE Coordination Needed: VPDES No. VA0062669 Stony Creek WWTF
Importance: High

Gladys,

Please see the attached threatened and endangered species coordination form for the Stony Creek Wastewater Treatment Facility's VPDES permit (No. VA0062669) reissuance. The current 2011-2016 permit, fact sheet, and reissuance application can be found at the following link:
http://www.deq.virginia.gov/fileshare/wps/VA0062669%20Stony%20Creek%20WWTP/

Please let me know if you need anything additional to complete the requested T&E coordination.

Thank you,
Adam

Adam Eller
Environmental Specialist II
Department of Environmental Quality
Piedmont Regional Office
4949-A Cox Road
Glen Allen, VA 23060

Phone: (804) 527-5046
Fax: (804) 527-5106
Email: adam.eller@deq.virginia.gov
Website: www.deq.virginia.gov

Molly Joseph Ward
Secretary of Natural Resources

Clyde E. Cristman
Director

COMMONWEALTH of VIRGINIA
DEPARTMENT OF CONSERVATION AND RECREATION

Joe Elton
Deputy Director of Operations

Rochelle Altholz
Deputy Director of Administration and Finance

David Dowling
Deputy Director of Soil and Water and Dam Safety

December 21, 2015

Adam Eller
DEQ – Piedmont Regional Office
4949-A Cox Road
Glen Allen, VA 23060

Re: VA0062669, Stony Creek WWTF Permit Reissuance

Dear Mr. Eller:

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 Stony Creek at Rt. 657 Stream Conservation Unit (SCU) is within and adjacent to 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 given a biodiversity significance ranking based on the rarity, quality, and number of element occurrences they contain; on a scale of 1-5, 1 being most significant. The Stony Creek at Rt. 657 SCU has been given a biodiversity significance ranking of B2, which represents a site of very high significance. The natural heritage resource of concern associated with this SCU is:

Aquatic Natural Community	SC-Nottoway Fifth Order Stream	G1G2/S1S2/NL/NL

The documented Aquatic Natural Community is based on Virginia Commonwealth University's **INSTAR** (*Interactive Stream Assessment Resource*) database which includes over 2,000 aquatic (stream and river) collections statewide for fish and macroinvertebrate. These data represent fish and macroinvertebrate assemblages, instream habitat, and stream health assessments. The associated Aquatic Natural Community is significant on multiple levels. First, this stream is a grade B, as per the VCU-Center for Environmental Sciences (CES), indicating its relative regional significance, considering its aquatic community composition and the present-day conditions of other streams in the region. This stream reach also holds an "Exceptional" stream designation as per the INSTAR Virtual Stream Assessment (VSS) score. This score assesses the similarity of this stream to ideal stream conditions of biology and habitat for this region. Lastly, this stream contributes to high Biological Integrity at the watershed level (6th order) based on number of native/non-native, pollution-tolerant/intolerant and rare, threatened or endangered fish and macroinvertebrate species present.

Threats to the significant Aquatic Natural Community and the surrounding watershed include water quality degradation related to point and non-point pollution, water withdrawal and introduction of non-native species.

In addition, the Roanoke logperch (*Percina rex*, G1G2/S1S2/LE/LE) has been historically documented in Stony Creek. The Roanoke logperch is endemic to the Roanoke and Chowan River drainages in Virginia (Burkhead and Jenkins, 1991) and inhabits medium and large, warm and usually clear rivers with sandy to boulder spotted bottoms (NatureServe, 2009). Please note that this species is currently classified as endangered by the United States Fish and Wildlife Service (USFWS) and the Virginia Department of Game and Inland Fisheries (VDGIF).

The Roanoke logperch is threatened by channelization, siltation, impoundment, pollution, and de-watering activities (Burkhead & Jenkins, 1991).

Furthermore, Stony Creek 1 has been designated by the VDGIF as a "Threatened and Endangered Species Water." The species associated with this T & E Water is the Roanoke logperch.

To minimize adverse impacts to the aquatic ecosystem as a result of the proposed activities, DCR recommends the implementation of and strict adherence to applicable state and local erosion and sediment control/storm water management laws and regulations, establishment/enhancement of riparian buffers with native plant species and maintaining natural stream flow. To minimize impacts to aquatic resources, DCR recommends the use of uv/ozone to replace chlorination disinfection and utilization of new technologies as they become available to improve water quality. Due to the presence of freshwater mussels, DCR recommends adoption of the EPA ammonia limits to be protective of mussels. Finally, due to the legal status of the Roanoke logperch, DCR recommends coordination with the USFWS and the VDGIF, Virginia's regulatory authority for the management and protection of this species to ensure compliance with protected species legislation.

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 Ernie Aschenbach at 804-367-2733 or Ernie.Aschenbach@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 Anderson, USFWS
Ernie Aschenbach, VDGIF

Literature Cited

Burkhead, N.M. and R.E. Jenkins. 1991. Roanoke logperch. In Virginia's Endangered Species: Proceedings of a Symposium. K. Terwilliger ed. The McDonald and Woodward Publishing Company, Blacksburg, Virginia. p. 395-397.

NatureServe. 2009. NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1. NatureServe, Arlington, Virginia. Available http://www.natureserve.org/explorer. (Accessed: June 21, 2010).

Archived: Wednesday, March 16, 2016 1:30:06 PM
From: Hillman, Brett
Sent: Thursday, December 17, 2015 11:18:41 AM
To: Eller, Adam (DEQ)
Subject: VA0062669 Stony Creek WWTF - USFWS Comments
Response requested: Yes
Importance: Normal

Hi Adam,

Thank you for sending us the materials necessary to review the above referenced proposed permit. We wanted to review this one closely because two federally listed endangered species, the Roanoke logperch (*Percina rex*) and the dwarf wedgemussel (A*lasmidonta heterodon*), are known to occur just downstream of this facility's discharge.

Freshwater mussels, including the dwarf wedgemussel, are known to be very sensitive to ammonia. Therefore, we recommend that the 2013 EPA ammonia criteria be used to determine the ammonia limitations for this discharge. Although these criteria have not yet been adopted into the Virginia Water Quality Standards, they are more stringent than the current ammonia criteria and are believed to be protective of freshwater mussels.

In addition, we urge the permittee to consider employing ultraviolet disinfection instead of disinfection methods involving chlorine. This will decrease the concentration of chlorine in the discharge and should result in water quality that is more favorable to both the dwarf wedgemussel and Roanoke logperch.

Finally, we support continued efforts by DEQ and the permittee to identify and address inflow and infiltration issues at this facility.

Thanks again for the opportunity to comment. Please don't hesitate to contact me with any questions or comments you may have.

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

Attachment J – Local Government and Riparian Landowner Notifications

COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY
PIEDMONT REGIONAL OFFICE
4949-A Cox Road, Glen Allen, Virginia 23060
(804) 527-5020 Fax (804) 527-5106
www.deq.virginia.gov

Molly Joseph Ward
Secretary of Natural Resources

David K. Paylor
Director

Michael P. Murphy
Regional Director

February 17, 2016

Deborah A. Davis
County Administrator
Sussex County, VA

Sent electronically:
ddavis@sussexcountyva.gov

Re: Local Government Notification of VPDES Permit No. VA0062669 Stony Creek Wastewater Treatment Facility (WWTF);
Application for VPDES Permit Reissuance with Additional (Expanded) Flow Tier:

Dear Ms. Davis:

This is to inform you that the Department of Environmental Quality has received an application for a Virginia Pollutant Discharge Elimination System (VPDES) permit from the Sussex Service Authority. The applicant proposes to increase the rate of discharge of treated wastewater from a municipal wastewater treatment plant (Stony Creek WWTF) located at 12521 Setzer Road, Stony Creek, VA 23882. The existing permitted design capacity of the WWTF is 40,000 gallons per day; the applicant proposes to increase the design capacity to 60,000 gallons per day. Section 62.1-44.15:4 of the Code of Virginia requires DEQ to notify localities and adjoining landowners when a permit application is received. Your name was provided to DEQ by the Commissioner of Revenue.

The Department will review the application and may draft a permit for this discharge. If the Department drafts a permit a notice will appear in a newspaper of local circulation announcing our intention to issue the permit and inviting public comment on its content. This public comment period will run for 30 days from the date the notice first appears in the newspaper. In the meantime, you are welcome to review the permit application at our office during normal business hours.

Please contact me at (804)527-5046 or Adam.Eller@deq.virginia.gov if you have any questions about this notification.

Sincerely,

Adam C. Eller
VPDES Permit Writer

Cc: File

COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY

PIEDMONT REGIONAL OFFICE
4949-A Cox Road, Glen Allen, Virginia 23060
(804) 527-5020 Fax (804) 527-5106
www.deq.virginia.gov

Molly Joseph Ward
Secretary of Natural Resources

David K. Paylor
Director

Michael P. Murphy
Regional Director

February 17, 2016

Ralph Lee Dunn
5620 Teterling Court
Chester, VA 23631

Re: Land Parcel 67-A-14 in Stony Creek, VA

Dear Property Owner:

This is to inform you that the Department of Environmental Quality has received an application for a Virginia Pollutant Discharge Elimination System (VPDES) permit from the Sussex Service Authority. The applicant proposes to increase the rate of discharge of treated wastewater from a municipal wastewater treatment plant (Stony Creek Wastewater Treatment Facility) located at 12521 Setzer Road, Stony Creek, VA 23882. Section 62.1-44.15:4 of the Code of Virginia requires DEQ to notify localities and adjoining landowners when a permit application is received. Your name was provided to DEQ by the Commissioner of Revenue.

The Department will review the application and may draft a permit for this discharge. If the Department drafts a permit a notice will appear in a newspaper of local circulation announcing our intention to issue the permit and inviting public comment on its content. This public comment period will run for 30 days from the date the notice first appears in the newspaper. In the meantime, you are welcome to review the permit application at our office during normal business hours.

Please contact me at (804)527-5046 or Adam.Eller@deq.virginia.gov if you have any questions about this notification.

Sincerely,

Adam C. Eller

Adam C. Eller
VPDES Permit Writer

Cc: File

COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY

PIEDMONT REGIONAL OFFICE
4949-A Cox Road, Glen Allen, Virginia 23060
(804) 527-5020 Fax (804) 527-5106
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Molly Joseph Ward
Secretary of Natural Resources

David K. Paylor
Director

Michael P. Murphy
Regional Director

February 17, 2016

Annie Dobie Peebles & Mary Dunn Conover
17015 Cabin Point Road
Carson, VA 23830

Re: Land Parcel 67-A-19 in Stony Creek, VA

Dear Property Owner:

This is to inform you that the Department of Environmental Quality has received an application for a Virginia Pollutant Discharge Elimination System (VPDES) permit from the Sussex Service Authority. The applicant proposes to increase the rate of discharge of treated wastewater from a municipal wastewater treatment plant (Stony Creek Wastewater Treatment Facility) located at 12521 Setzer Road, Stony Creek, VA 23882. Section 62.1-44.15:4 of the Code of Virginia requires DEQ to notify localities and adjoining landowners when a permit application is received. Your name was provided to DEQ by the Commissioner of Revenue.

The Department will review the application and may draft a permit for this discharge. If the Department drafts a permit a notice will appear in a newspaper of local circulation announcing our intention to issue the permit and inviting public comment on its content. This public comment period will run for 30 days from the date the notice first appears in the newspaper. In the meantime, you are welcome to review the permit application at our office during normal business hours.

Please contact me at (804)527-5046 or Adam.Eller@deq.virginia.gov if you have any questions about this notification.

Sincerely,

Adam C. Eller

Adam C. Eller
VPDES Permit Writer

Cc: File

COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY

PIEDMONT REGIONAL OFFICE
4949-A Cox Road, Glen Allen, Virginia 23060
(804) 527-5020 Fax (804) 527-5106
www.deq.virginia.gov

Molly Joseph Ward
Secretary of Natural Resources

David K. Paylor
Director

Michael P. Murphy
Regional Director

February 17, 2016

Adams Construction Company, Inc.
523 Rutherford Avenue
Roanoke, VA 24016

Re: Land Parcel 67-A-15 in Stony Creek, VA

Dear Property Owner:

This is to inform you that the Department of Environmental Quality has received an application for a Virginia Pollutant Discharge Elimination System (VPDES) permit from the Sussex Service Authority. The applicant proposes to increase the rate of discharge of treated wastewater from a municipal wastewater treatment plant (Stony Creek Wastewater Treatment Facility) located at 12521 Setzer Road, Stony Creek, VA 23882. Section 62.1-44.15:4 of the Code of Virginia requires DEQ to notify localities and adjoining landowners when a permit application is received. Your name was provided to DEQ by the Commissioner of Revenue.

The Department will review the application and may draft a permit for this discharge. If the Department drafts a permit a notice will appear in a newspaper of local circulation announcing our intention to issue the permit and inviting public comment on its content. This public comment period will run for 30 days from the date the notice first appears in the newspaper. In the meantime, you are welcome to review the permit application at our office during normal business hours.

Please contact me at (804)527-5046 or Adam.Eller@deq.virginia.gov if you have any questions about this notification.

Sincerely,

Adam C. Eller

Adam C. Eller
VPDES Permit Writer

Cc: File

COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY

PIEDMONT REGIONAL OFFICE
4949-A Cox Road, Glen Allen, Virginia 23060
(804) 527-5020 Fax (804) 527-5106
www.deq.virginia.gov

Molly Joseph Ward
Secretary of Natural Resources

David K. Paylor
Director

Michael P. Murphy
Regional Director

February 17, 2016

Barbara A. Prince
107 Hummingbird Lane
Franklin, VA 23851

Re: Land Parcel 67-A-20 in Stony Creek, VA

Dear Property Owner:

This is to inform you that the Department of Environmental Quality has received an application for a Virginia Pollutant Discharge Elimination System (VPDES) permit from the Sussex Service Authority. The applicant proposes to increase the rate of discharge of treated wastewater from a municipal wastewater treatment plant (Stony Creek Wastewater Treatment Facility) located at 12521 Setzer Road, Stony Creek, VA 23882. Section 62.1-44.15:4 of the Code of Virginia requires DEQ to notify localities and adjoining landowners when a permit application is received. Your name was provided to DEQ by the Commissioner of Revenue.

The Department will review the application and may draft a permit for this discharge. If the Department drafts a permit a notice will appear in a newspaper of local circulation announcing our intention to issue the permit and inviting public comment on its content. This public comment period will run for 30 days from the date the notice first appears in the newspaper. In the meantime, you are welcome to review the permit application at our office during normal business hours.

Please contact me at (804)527-5046 or Adam.Eller@deq.virginia.gov if you have any questions about this notification.

Sincerely,

Adam C. Eller

Adam C. Eller
VPDES Permit Writer

Cc: File

COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY

PIEDMONT REGIONAL OFFICE
4949-A Cox Road, Glen Allen, Virginia 23060
(804) 527-5020 Fax (804) 527-5106
www.deq.virginia.gov

Molly Joseph Ward
Secretary of Natural Resources

David K. Paylor
Director

Michael P. Murphy
Regional Director

February 17, 2016

Danka Ignatoff
5413 North Robert Road
Prescott Valley, AZ 06341

Re: Land Parcel 67-A-22 in Stony Creek, VA

Dear Property Owner:

This is to inform you that the Department of Environmental Quality has received an application for a Virginia Pollutant Discharge Elimination System (VPDES) permit from the Sussex Service Authority. The applicant proposes to increase the rate of discharge of treated wastewater from a municipal wastewater treatment plant (Stony Creek Wastewater Treatment Facility) located at 12521 Setzer Road, Stony Creek, VA 23882. Section 62.1-44.15:4 of the Code of Virginia requires DEQ to notify localities and adjoining landowners when a permit application is received. Your name was provided to DEQ by the Commissioner of Revenue.

The Department will review the application and may draft a permit for this discharge. If the Department drafts a permit a notice will appear in a newspaper of local circulation announcing our intention to issue the permit and inviting public comment on its content. This public comment period will run for 30 days from the date the notice first appears in the newspaper. In the meantime, you are welcome to review the permit application at our office during normal business hours.

Please contact me at (804)527-5046 or Adam.Eller@deq.virginia.gov if you have any questions about this notification.

Sincerely,

Adam C. Eller

Adam C. Eller
VPDES Permit Writer

Cc: File

COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY

PIEDMONT REGIONAL OFFICE
4949-A Cox Road, Glen Allen, Virginia 23060
(804) 527-5020 Fax (804) 527-5106
www.deq.virginia.gov

Molly Joseph Ward
Secretary of Natural Resources

David K. Paylor
Director

Michael P. Murphy
Regional Director

February 17, 2016

Lawrence Chester Carter
14124 Sussex Drive
Stony Creek, VA 23882

Re: Land Parcel 67-A-28 in Stony Creek, VA

Dear Property Owner:

This is to inform you that the Department of Environmental Quality has received an application for a Virginia Pollutant Discharge Elimination System (VPDES) permit from the Sussex Service Authority. The applicant proposes to increase the rate of discharge of treated wastewater from a municipal wastewater treatment plant (Stony Creek Wastewater Treatment Facility) located at 12521 Setzer Road, Stony Creek, VA 23882. Section 62.1-44.15:4 of the Code of Virginia requires DEQ to notify localities and adjoining landowners when a permit application is received. Your name was provided to DEQ by the Commissioner of Revenue.

The Department will review the application and may draft a permit for this discharge. If the Department drafts a permit a notice will appear in a newspaper of local circulation announcing our intention to issue the permit and inviting public comment on its content. This public comment period will run for 30 days from the date the notice first appears in the newspaper. In the meantime, you are welcome to review the permit application at our office during normal business hours.

Please contact me at (804)527-5046 or Adam.Eller@deq.virginia.gov if you have any questions about this notification.

Sincerely,

Adam C. Eller

Adam C. Eller
VPDES Permit Writer

Cc: File

COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY

PIEDMONT REGIONAL OFFICE
4949-A Cox Road, Glen Allen, Virginia 23060
(804) 527-5020 Fax (804) 527-5106
www.deq.virginia.gov

Molly Joseph Ward
Secretary of Natural Resources

David K. Paylor
Director

Michael P. Murphy
Regional Director

February 17, 2016

Paige B. Prince
14499 Courthouse Road
Stony Creek, VA 23882

Re: Land Parcel 67-A-18 in Stony Creek, VA

Dear Property Owner:

This is to inform you that the Department of Environmental Quality has received an application for a Virginia Pollutant Discharge Elimination System (VPDES) permit from the Sussex Service Authority. The applicant proposes to increase the rate of discharge of treated wastewater from a municipal wastewater treatment plant (Stony Creek Wastewater Treatment Facility) located at 12521 Setzer Road, Stony Creek, VA 23882. Section 62.1-44.15:4 of the Code of Virginia requires DEQ to notify localities and adjoining landowners when a permit application is received. Your name was provided to DEQ by the Commissioner of Revenue.

The Department will review the application and may draft a permit for this discharge. If the Department drafts a permit a notice will appear in a newspaper of local circulation announcing our intention to issue the permit and inviting public comment on its content. This public comment period will run for 30 days from the date the notice first appears in the newspaper. In the meantime, you are welcome to review the permit application at our office during normal business hours.

Please contact me at (804)527-5046 or Adam.Eller@deq.virginia.gov if you have any questions about this notification.

Sincerely,

Adam C. Eller
VPDES Permit Writer

Cc: File

COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY

PIEDMONT REGIONAL OFFICE
4949-A Cox Road, Glen Allen, Virginia 23060
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www.deq.virginia.gov

Molly Joseph Ward
Secretary of Natural Resources

David K. Paylor
Director

Michael P. Murphy
Regional Director

February 17, 2016

Preston B. Harville
9045 Chevy Lane
Carson, VA 23830

Re: Land Parcel 67-A-21 in Stony Creek, VA

Dear Property Owner:

This is to inform you that the Department of Environmental Quality has received an application for a Virginia Pollutant Discharge Elimination System (VPDES) permit from the Sussex Service Authority. The applicant proposes to increase the rate of discharge of treated wastewater from a municipal wastewater treatment plant (Stony Creek Wastewater Treatment Facility) located at 12521 Setzer Road, Stony Creek, VA 23882. Section 62.1-44.15:4 of the Code of Virginia requires DEQ to notify localities and adjoining landowners when a permit application is received. Your name was provided to DEQ by the Commissioner of Revenue.

The Department will review the application and may draft a permit for this discharge. If the Department drafts a permit a notice will appear in a newspaper of local circulation announcing our intention to issue the permit and inviting public comment on its content. This public comment period will run for 30 days from the date the notice first appears in the newspaper. In the meantime, you are welcome to review the permit application at our office during normal business hours.

Please contact me at (804)527-5046 or Adam.Eller@deq.virginia.gov if you have any questions about this notification.

Sincerely,

Adam C. Eller
VPDES Permit Writer

Cc: File

COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY

PIEDMONT REGIONAL OFFICE
4949-A Cox Road, Glen Allen, Virginia 23060
(804) 527-5020 Fax (804) 527-5106
www.deq.virginia.gov

Molly Joseph Ward
Secretary of Natural Resources

David K. Paylor
Director

Michael P. Murphy
Regional Director

February 17, 2016

Prince Sussex Farms LLLP
109 State Street
Emporia, VA 23847

Re: Land Parcel 67-A-27 (13371 Gee Farm Road) in Stony Creek, VA

Dear Property Owner:

This is to inform you that the Department of Environmental Quality has received an application for a Virginia Pollutant Discharge Elimination System (VPDES) permit from the Sussex Service Authority. The applicant proposes to increase the rate of discharge of treated wastewater from a municipal wastewater treatment plant (Stony Creek Wastewater Treatment Facility) located at 12521 Setzer Road, Stony Creek, VA 23882. Section 62.1-44.15:4 of the Code of Virginia requires DEQ to notify localities and adjoining landowners when a permit application is received. Your name was provided to DEQ by the Commissioner of Revenue.

The Department will review the application and may draft a permit for this discharge. If the Department drafts a permit a notice will appear in a newspaper of local circulation announcing our intention to issue the permit and inviting public comment on its content. This public comment period will run for 30 days from the date the notice first appears in the newspaper. In the meantime, you are welcome to review the permit application at our office during normal business hours.

Please contact me at (804)527-5046 or Adam.Eller@deq.virginia.gov if you have any questions about this notification.

Sincerely,

Adam C. Eller

Adam C. Eller
VPDES Permit Writer

Cc: File

Attachment K – CTO for Stony Creek WWTP Improvements (Mechanical Aerators)

COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY
PIEDMONT REGIONAL OFFICE
4949A Cox Road, Glen Allen, Virginia 23060
(804) 527-5020 Fax (804) 527-5106
www.deq.virginia.gov

Mary Joseph Ward
Secretary of Natural Resources

David K. Paylor
Director

Michael P. Murphy
Regional Director

July 3, 2014

Mike Kearns
Deputy Director
Sussex Service Authority
4385 Beef Steak Road
Waverly, VA 23890
Transmitted electronically: mkearns@ssa-va.org

Subject: Certificate to Operate (CTO) - PT Log # 26124, Stony Creek WWTP Improvements, VPDES Permit No. VA0062669

Dear Mr. Kearns:

The design engineer, Mr. Henry M. Bugg, P.E., with B&B Consultants, Inc., certified in the Certificate to Operate (CTO) application received on June 5, 2014 that the facility's project has been completed, substantially in accordance with the approved plans. In accordance with the Code of Virginia, Title 2.1, Section 62.1-44.19, attached please find the CTO for this project. The owner is authorized to operate these facilities in accordance with the Sewage Collection and Treatment Regulations.

If you would like further information regarding the project or if you have any questions regarding this matter, please contact Adam Eller of my staff at (804) 527-5046 or adam.eller@deq.virginia.gov.

Sincerely,

Emilee C. Adamson

Emilee C. Adamson
VPDES Permits Manager

cc: Henry M. Bugg: (hmbugg@bandbcons.com)
DEQ-PRO VWP Permit Program: (Allison.Dunaway@deq.virginia.gov)
William Travis Luter Sr., Building Official, Sussex County: (tluter@sussexcountyva.com)
File: CTC/CTO, ECM

Department of Environmental Quality
APPLICATION for CERTIFICATE TO OPERATE
Under the Sewage Collection and Treatment Regulations 9 VAC 25-790
and/or the Water Reclamation and Reuse Regulation 9 VAC 25-740

See instructions. Submit 1 copy of this form and any attachments. Form will expand as you enter information.

Project Title: (as it appears on plans) Stony Creek WWTP Improvements P.E. Seal Date on Cover: April 8, 2014 Specifications Title and Date: NA	RECEIVED PRO JUN 05 2014
Location of Project:	County/City: Stony Creek, VA
Receiving Wastewater Collection System(s): Stony Creek Collection System	
Receiving Sewage Treatment Plant(s): NA	
PROJECT OWNER:	**RESPONSIBLE ENGINEER**
Owner Contact Name: Mike Kearns	Name: Henry M. Bugg
Title: Deputy Director	Company Name: B & B Consultants, Inc.
Address: Sussex Service Authority 4385 Beef Steak Road, Waverly, VA 23890	Address: 212 East Ferrell Street P. O. Box 429 South Hill, VA 23970
Phone: 804-834-6903	Phone: 434-447-7621
Email: mkearns@ssa-va.org	Email: hmbugg@bandbcons.com
Owner Signature and Date: Michael P. Kearns 6/2/14	

PTL NUMBER FROM CERTIFICATE TO CONSTRUCT: #26087

Attach Copy of the original Certificate to Construct if issued prior to November 9, 2008. If applicable, provide verification of compliance with any conditions in the Certificate to Construct.

Design Flow: (a) average daily flow (MGD): 0.419 (b) peak flow (MGD): 0.103

For sewage treatment plant, water reclamation or satellite reclamation projects, provide the VPDES/VPA Permit Number: VA0062669

Is a new Discharge Monitoring Report (DMR) or other monthly monitoring report required? Yes ☐ No ☒

For Pump Stations, Sewage Treatment Plants, and Reclamation Systems, check Reliability Class: I ☐ II ☒ III ☐ NA ☐

Two options are provided for the Statement of Completion, depending on whether the project is being authorized under the Sewage Collection and Treatment Regulations, the Water Reclamation and Reuse Regulations, or BOTH. Please check the appropriate box and then provide signature and seal below as indicated.

☒ *The following statement of completion for issuance of a Certificate to Operate under the Sewage Collection and Treatment Regulations must be signed and sealed by the responsible engineer.* (DEQ will not conduct a confirming inspection.)

"The construction of the project has been completed in accordance with the referenced plans and specifications or revised only in accordance with 9 VAC 25-790-180.B, and inspections have been performed to make this statement in accordance with Section 9 VAC 25-790-180.C.1 of the Sewage Collection and Treatment Regulations."

COMMONWEALTH OF VIRGINIA
HENRY M. BUGG
Lic. No. 05194
5/29/14
PROFESSIONAL ENGINEER

Licensed Engineer's Signature and original seal (signed and dated)

☐ *The following statement of completion for issuance of a Certificate to Operate under the Water Reclamation and Reuse Regulation must be signed and sealed by the responsible engineer.* (DEQ will not conduct a confirming inspection.)

"The construction of the project has been completed in accordance with the referenced plans and specifications or revised only in accordance with 9 VAC 25-740-120-B.2.b. and inspections have been performed to make this statement in accordance with Section 9 VAC 25-40-120.B.3.a. of the Water Reclamation and Reuse Regulations."

Licensed Engineer's Signature and original seal (signed and dated)

For DEQ use only:

In accordance with *Code of Virginia* 1950, as amended, Title 62.1, Section 62.1-44.19, this form, signed by the appropriate DEQ representative, serves as the **Certificate to Operate** for the referenced project.

Emilee C. Adamson	Emilee C. Adamson	July 3, 2014	26124
Name	Signature	Date	CTO PTL Number

Department of Environmental Quality Authorized Representative

An Operation and Maintenance Manual must be submitted to the DEQ Regional Office in accordance with 9 VAC 25-790 for sewage treatment plants, 9 VAC 25-740 for water reclamation systems and satellite reclamation systems and VPDES or VPA permit requirements.

For pump stations, an Operation and Maintenance Manual must be maintained for the facility in accordance with 9 VAC 25-790, but is NOT to be submitted to DEQ. The pump station must be operated and maintained in accordance with that manual.

Sussex Service Authority

4385 Beef Steak Road
Waverly, Virginia 23890
Phone: (804) 834-8930
Fax: (804) 834-8933

April 11, 2014

RECEIVED PRO
APR 11 2014

Adam Eller
Environmental Specialist II
Virginia DEQ, Piedmont Regional Office
4949-A Cox Road
Glen Allen, Virginia 23060

VIA: Hand Delivered

RE: Application for Certificate to Construct
Stony Creek Wastewater Treatment Facility
VPDES Permit No. VA0062669

Dear Mr. Eller:

Enclosed please find our completed Application for a Certificate to Construct (CTC) the Stony Creek Waste Water Facility improvements. This CTC was prepared by B & B Consulting, Inc. who has knowledge of this facility due to their prior involvement.

We would greatly appreciate an expedited review of this submission so that these improvements can be completed prior to the onset of the summer temperatures.

If you have any questions regarding this submission, please contact me at (804)834-6903.

Respectfully submitted,

Michael P. Kearns

Michael P. Kearns
Engineer / Deputy Director

CC: Robert Magette, Operations Manager, Sussex Service Authority
Frank H. Irving, III, Executive Director, Sussex Service Authority
Henry M. Bugg, P.E. B & B Consultants, Inc.

Virginia Department of Environmental Quality

APPLICATION for CERTIFICATE TO CONSTRUCT (CTC)

For Municipal Sewage Collection, Treatment, and/or Reclamation Systems

See Instructions. Do not submit plans and specifications. Submit 1 copy of this form with all attachments. Form will expand as you enter information.

Project Title: (as it appears on plans) Stony Creek WWTP Improvements P.E. Seal Date on Cover: April 8, 2014 Specifications Title and Date: NA	
Location of Project:	County/City: Stony Creek, VA
Receiving Wastewater Collection System(s): Stony Creek Collection System	
Receiving Sewage Treatment Plant(s)/Reclamation System: NA	
PROJECT OWNER:	**PROJECT ENGINEER**
Owner Contact Name: Mike Kearns	Name: Henry M. Bugg
Title: Deputy Director	Company Name: B & B Consultants, Inc.
Address: Sussex Service Authority 4385 Beef Steak Rd, Waverly, VA 23890	Address: 212 E. Ferrell Street PO Box 429, South Hill, VA 23970
Phone: 804-834-6903	Phone: 434-447-7621
Email: mkearns@ssa-va.org	Email: hmbugg@bandbcons.com
Owner Signature and date: Michael P. Kearns 4/11/14	

For Sewage Treatment Works and Sewage Collection Systems:

Attach Project Description Add surface aerators to existing two cell aerated lagoon

Attach Letter(s) of Acceptance from Receiving Facility/Utility for sewage collection system projects NA

Attach Reliability Class: (1) For Pump Stations attach Reliability Class Worksheet. (2) For Sewage Treatment Plants note the Reliability Class rating from the VPDES or VPA permit and method of meeting reliability classification requirements.

Reliability Class 2. Measures taken to satisfy this class requirement is same as existing WWTP

For a sewage treatment plant project, provide the VPDES or VPA permit number: VA0062669

Design Sewage Flow (Sewage Plant): (a) average daily flow (MGD): 0.419 (b) peak daily flow (MGD): 0.103

Design Sewage Flow (Pump Station): (a) average daily flow (MGD): NA (b) peak hour flow (MGD): NA

Please check the appropriate components of your project:

Gravity and/or Vacuum Sewer	☐	New Sewage Treatment Plant	☐
Pump Station(s)	☐	Modification of Existing Sewage Treatment Plant	☒
Force Main(s)	☐	Expansion of Existing Sewage Treatment Plant	☐

For Reclamation or Satellite Reclamation System, Attach Page 2: Page 2 Attached? Yes ☐ No ☒

The following statement must be signed and sealed by the Virginia licensed design engineer:

"As discussed in 9 VAC 25-790-240.C., the referenced design documents are in substantial compliance with Part III - Manual of Practice For Sewerage Systems and Treatment Works, of the Sewage Collection and Treatment Regulations (9 VAC 25-790-310 et seq.)"

COMMONWEALTH OF VIRGINIA
HENRY M. BUGG
Lic. No. 05194
4/9/14
PROFESSIONAL ENGINEER

Licensed Design Engineer's Signature and original seal (signed and dated)

☐ **Design exceptions and justifications are attached in accordance with 9 VAC 25-790-240.C.**

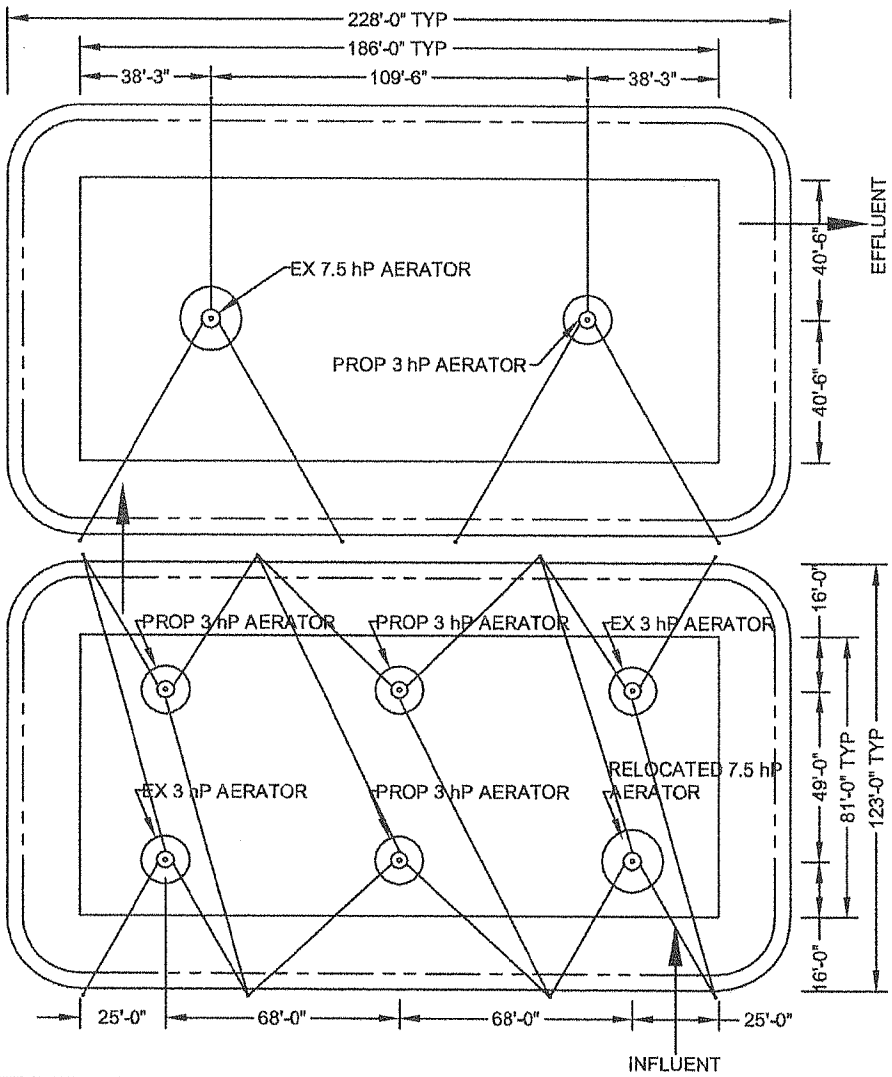
For DEQ use only:

In accordance with the *Code of Virginia* 1950, as amended, Title 62.1, Section 62.1-44.19, this form, signed by the appropriate DEQ representative, constitutes your Certificate to Construct. This Certificate is valid for a period of five years from the date of issuance. Other permits and authorizations may be necessary. Please contact your Regional DEQ Office if you have any questions.

Emilee C. Adamson	Emilee C. Adamson	April 15, 2014	26087
Name	Signature	Date	CTC PTL Number

Department of Environmental Quality Authorized Representative

Note: Once the project is complete, an application for a Certificate to Operate must be submitted to the appropriate DEQ Regional office.



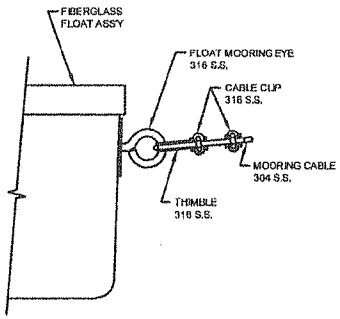
CALCULATIONS:
THE MANUFACTURER'S CALCS (PAGES 1-6) ARE INCLUDED AS PART OF THE DESIGN CONSTRUCTION DOCUMENTS.

COMMONWEALTH OF VIRGINIA
HENRY M. BUGG
Lic. No. 05194
4/8/14
PROFESSIONAL ENGINEER

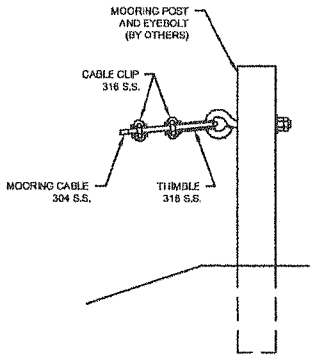
LAGOON #1:
RELOCATE (1) 7.5 hP AERATOR AND INSTALL (3) 3 hP AQUA-JET AERATORS OR APPROVED EQUAL AS SHOWN ON DRAWING AND IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.

LAGOON #2:
INSTALL (1) 3 hP AQUAT-JET AERATORS OR APPROVED EQUAL AS SHOWN ON DRAWING AND IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.

ELECTRICAL:
ALL ELECTRICAL COMPONENTS SHALL BE INSTALLED IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE BY A LICENSED ELECTRICIAN.



FLOAT MOORING DETAIL



SHORE MOORING DETAIL

SCALE: 1" = 50'	APRIL 07, 2014

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

SITE LAYOUT PLAN

STONY CREEK WWTP IMPROVEMENTS
SUSSEX COUNTY, VIRGINIA

Aeration Calculations
for
Stony Creek WWTP Improvement
Stony Creek, VA
Sussex Service Authority
April 8, 2014

Objective: Recommend quantity and size of Aqua-Jet aerators to upgrade an existing lagoon system to accommodate 50,000 GPD flow rate.

Design Data:

Wastewater Characteristics

Design Flow	=	0.05 MGD
Wastewater Temp	=	25 °C (summer, assumed)
	=	10 °C (winter, assumed)
Influent BOD	=	200 mg/l
Influent TSS	=	200 mg/l
Influent TKN	=	30 mg/l

Effluent Required

Effluent BOD	=	30 mg/l
Effluent TSS	=	30 mg/l

Basin Dimensions

		Lagoon 1	Lagoons 2
WS Dimensions	=	262 ft x 117 ft	262 ft x 117 ft
Bottom Dimensions	=	226 ft x 81 ft	226 ft x 81 ft
Water Depth	=	6 ft	6 ft
Side Slope	=	3:1	3:1
Volume at 6' SWD	=	1.09 MG	1.09 MG
Construction	=	lined	lined
Elevation	=	665 ft	665 ft

Scope:

The existing aerated lagoon system has 2 x 1-MG lagoons that are operated in series. Aqua-Jet aerators are sized to provide oxygen transfer and mixing to meet the effluent requirements at 50,000 GPD design flow rate.

Calculations:

Lagoons 1 - Complete Mix

Hydraulic Retention Time

HRT = 1.09 MG / 0.05 MG

= 21.8 days

BOD Removal

Based on complete mix kinetics, the Eckenfelder Model calculates the following effluent characteristics from cell 1:

	Summer	Winter
Soluble BOD (mg/l)	6	8

Refer to attached Lagoon 1 BOD removal calculations for details.

Actual Oxygen Requirement

The oxygen demand is based on 1.5 lb O2 / lb BOD removed and 4.6 lb O2 / lb TKN subject to nitrification.

AOR (BOD) = 1.5 lb/lb x (200 - 6) mg/l x 0.05 MGD x 8.34 / 24 hr
= 5 lb O_2 / hr

Nutrient TKN = 0.05 mg TKN /mg BOD x 200 mg/l
= 10 mg/l

TKN Remaining = 30 mg/l - 10 mg/l
= 20 mg/l

4.6 lb/lb x 20 mg/l x 0.05 MGD x 8.34 / 24 hr
AOR (TKN) = 2 lb O_2 / hr

Therefore:
AOR (Total) = 7 lb O_2 / hr

Field Oxygen Transfer Efficiency

$$FTE = \frac{SOTE \times [(Cs \times \beta) - Cr] \times 1.024^{(T-20)} \times \alpha}{9.09}$$

where:

SOTE	=	3.0 lbs O_2 / BHP-hr
T	=	25 °C (assumed)
Cs	=	8.06 mg/l (at 25oC and 665 ft)
β	=	0.95 (typical, assumed)
α	=	0.85 (typical, assumed)
Cr	=	2.0 mg/l
FTE	=	1.79 lbs O_2 / BHP-hr

Power Requirements

$$\text{Power (aeration)} = \frac{7 \text{ lb/hr}}{1.79 \text{ lb/BHP-hr} \times 0.92}$$

$$= 4 \text{ HP}$$

A mixing level of approximately 20 HP/MG is recommended to provide complete oxygen dispersion and to maintain uniform concentration of biological solids in suspension.

Power (mixing) = 20 HP/MG x 1.09 MG
= 22 HP

Lagoon 2 - Partial Mix

Hydraulic Retention Time

HRT = 21.8 days @ the average daily flow

BOD Removal

Based on partial mix kinetics, the Eckenfelder Model calculates the following effluent characteristics from Lagoon 2:

	Summer	Winter
Soluble BOD (mg/l)	0.4	0.9

Refer to attached Lagoon 2 BOD removal calculations for details.

Mixing Requirement

A mixing level of approximately 8 HP/MG is recommended to provide partial mix conditions.

Power (mixing)	=	8 HP/MG x 1.09 MG
	=	9 HP

Recommendation:

Lagoon 1: Recommend 1 x 7.5 HP Aqua-Jet aerator and 5 x 3 HP Aqua-Jet aerators, with all aerators equipped with anti-erosion assemblies. The 7.5 HP aerator should be located nearest to the lagoon influent.

Lagoon 2: Recommend 1 x 7.5 HP Aqua-Jet aerator and 1 x 3 HP Aqua-Jet aerators with both aerators equipped with anti-erosion assemblies. The 7.5 HP aerator should be located nearest to the lagoon influent.

TAJ

Lagoon 1: MLVSS vs BODr in Complete Mix Aerated Lagoon

Stoney Creek WWTP, Stoney Creek, VA

$$Xv = \frac{a\,(So - Se)}{1 + b * t} \qquad Se = \frac{So}{1 + (k * Xv * t)}$$

where:

Xv = MLVSS Concentration (mg/l)

a = Sludge Synthesis Coefficient
= 0.73 (typical, assumed)

b = Sludge Auto-Oxidation Coefficient
= 0.075 (typical, assumed)

So = Influent Total BOD_5 (mg/l)
= 200 mg/l

Se = Effluent Soluble BOD_5 (mg/l)

k = BOD Removal Rate Coefficient (l/mg-day)
= 0.03 (assumed, summer)
= 0.02 (assumed, winter)

t = Hydraulic Retention Time of Cell 1 (days)
= 21.8 days

Based on complete mix kinetics, the Eckenfelder Model calculates the following effluent characteristics:

	Summer	Winter
Xv (mg/l)	54	53
Soluble BOD	6	8

Lagoon 2: Effluent BOD5 (Se) in Partially Mixed Aerated Lagoon

Stoney Creek WWTP, Stoney Creek, VA

$$Se = \frac{So}{(1 + (k * Xv * t))^n}$$

where:

So = Influent Soluble BOD_5 (mg/l)
= 6 mg/l (summer)
= 8 mg/l (winter)

Se = Effluent Soluble BOD_5 (mg/l)

n = Number of equally sized partially mixed cells in series
= 1

k = BOD Removal Rate Coefficient (l/mg-day)
= 0.03 (assumed, summer)
= 0.02 (assumed, winter)

Xv = Average MLVSS Concentration in Cell (mg/l)
= 20 mg/l (under partial mix conditions, assumed)

t = Hydraulic Retention Time (days)
= 21.8 days per cell

Based on partial mix kinetics, the Eckenfelder Model calculates the following effluent characteristics:

	Summer	Winter
Soluble BOD	0.4	0.9

Attachment L – I&I CAP Conditional Approval (2012)

COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY
PIEDMONT REGIONAL OFFICE
4949A Cox Road, Glen Allen, Virginia 23060
(804) 527-5020 Fax (804) 527-5106
www.deq.virginia.gov

Douglas W. Domenech
Secretary of Natural Resources

David K. Paylor
Director

Michael P. Murphy
Regional Director

February 21, 2012

Michael P. Kearns, Engineer
Sussex Service Authority
4385 Beef Steak Road
Waverly, Virginia 23890

Via e-mail: MKearns@ssa-va.org

Subject: Inflow and Infiltration (I&I) Corrective Action Plan (CAP)
Conditional Approval
Stony Creek Wastewater Treatment Facility (VA0062669)

Dear Mr. Kearns:

The subject plan was received at the Department of Environmental Quality's (DEQ) Piedmont Regional Office (PRO) January 31, 2012. DEQ staff has reviewed the plan and hereby grants conditional approval, upon satisfactory integration of the following conditions:

1. Submittal of a master plan list of necessary improvements and a schedule for corrective actions to be implemented during the permit term for DEQ review and approval per Task 8 of the proposed plan;

2. Annual progress reports are submitted to the DEQ PRO no later than August 10th of each year, in accordance with Part I.C.16 of permit VA0062669. The annual progress report is to include a description of the permittee's corrective actions taken over the previous year, an evaluation of sewer line conditions and effectiveness of previous corrective actions, and a prioritization of improvement and schedule for corrective actions to be taken within the next calendar year;

3. If any of the improvements listed in the master plan referenced in part 1 above are not met as scheduled, the permittee must provide with the annual report an explanation of the situation and a description of completed and intended actions to bring corrective actions back on schedule in accordance with the DEQ approved plan;

4. Submittal of a plan to address treatment works design capacity flows in accordance with the 95% capacity reopener in Part I.C.1 of the permit if I&I corrective action does not result in compliance with this condition.

Please proceed with the corrective action plan schedule presented on page VI-4 of the plan.

If you have any questions, you may contact your permit writer, Emilee Carpenter at 804/527-5072 or emilee.carpenter@deq. virginia.gov.

Sincerely,

Curtis J. Linderman, P.E.
Water Permit Manager

cc: Robert Magette, Plant Manager, Sussex Service Authority: rmagette@ssa-va.org
Frank Irving, Executive Director, Sussex Service Authority: firving@ssa-va.org
Stephanie Hudik, P.E., Bowman Consulting Group: shudik@bowmanconsulting.com

CJL/ecc

4385 Beef Steak Road
Waverly, Virginia 23890
Phone: (804) 834-8930
Fax: (804) 834-8933

Sussex Service Authority

August 10, 2011

RECEIVED
AUG 11 2011
PRO

Emilee C. Carpenter
Water Permit Writer, Senior
Piedmont Regional Office
Department of Environmental Quality
4949-A Cox Road
Glenn Allen, VA 23060

Re: Stony Creek WWTF
VPDES Permit No. VA0062669

Dear Ms. Carpenter,

Please consider this letter as our written notice of compliance for the Inflow and Infiltration (I&I) Study Requirement as set forth in Part I.C.16 of the current effective Virginia Pollutant Discharge Elimination System (VPDES) permit for the Stony Creek Wastewater Treatment Facility. Based on our evaluation of water produced, sold, and flushed from the water treatment facility versus the volume of water discharged from the lagoon wastewater treatment facility, we feel that there is not a significant problem of infiltration into the sewage collection system.

According to data collected at the wastewater treatment facility, the average flow from the outfall may exceed design flow only during occasional heavy rain events. Initially, we will take into consideration the area of the lagoons and the amount of rainfall recorded in order to determine a volume of rainfall that may impact the discharge flow. As a result, we should be able to determine if there is actually I&I within the collection system.

In order to address the possible issue of I&I, we will continue to monitor the water produced and the wastewater collected. In addition, we will evaluate the collection system throughout the permit cycle by smoke testing, camera inspections, and manhole inspections. Through our monitoring efforts, we should be able to locate potential problem areas and schedule for repair or replacement of sewer collection system defects.

If you have any questions or comments, do not hesitate to contact me.

Sincerely,

Richard L. Thompson, Jr.

Richard L. Thompson, Jr.
Plant Manager

Cc: Robert L. Gunnell, Jr.
Executive Director, Sussex Service Authority

Attachment M – Owner Comments and DEQ Response to Owner Comments

4385 Beef Steak Road
Waverly, Virginia 23890
Phone: (804) 834-8930
Fax: (804) 834-8933

Sussex Service Authority

April 20, 2016
Adam Eller
Environmental Specialist II
Virginia DEQ, Piedmont Regional Office
4949-A Cox Road
Glen Allen, Virginia 23060

VIA: Email on 4/20/16

RE: DRAFT PERMIT COMMENTS
Stony Creek Wastewater Treatment Facility
VPDES Permit No. VA0062669

Dear Mr. Eller:

We write this letter to submit our comments and requests regarding the draft permit we received from your office on April 6, 2016 as listed below:

1. Total Residual Chlorine (TRC) monitoring requirement (3 per day at 4 hour intervals) seems excessive for our small plant and will further stretch our operator's hours spent operating the plant. The SCAT Regulations appear to call for one per day. 9 VAC 25-790-960.

2. We request that the Department add a provision stating that the Part I.B. 1 & 3 TRC 0.6 and 1.0 limits do not apply if an E.coli sample was pulled and the result was ≤ 126. The permit should allow an E.coli sample within 1 hour of any result<0.6 (and <1.0); and if the result is ≤126, the result is not a permit violation and does not count against the 10% allowance.

3. We request the Department remove the 85% TSS/BOD/CBOD removal requirement. We believe it to be inappropriate here where there are lower CBOD limits and a dilute influent.

4. We request that the Department write in seasonally tiered limits. For high stream flow months there may be a better chance of making the CBOD and TKN limits.

5. The CBOD and TKN limits for our existing plant will be very difficult to meet. We requested the 0.06 MGD tier to account for the increase in our influent to the plant. A good portion of this additional influent is coming from our water plant green sand filters which we currently have to backwash twice per week. We are working to address this matter and once corrected we might be able to only require a 0.05 MGD tier. What CBOD and TKN limits would this tier generate?

6. A flow of 60,000 GPD (41.67 GPM) mixing with a 7 Day, 10-Year Low Flow (7Q10) of 280,000GPD (194.44 GPM) is a considerable amount of dilution and should not produce such strict limits. We ask the Department to rerun the Regional Stream Model to check these limits.

7. We believe that our existing plant will not be able to meet these new limits without some type of plant modifications. Sussex Service Authority only has 122 customers in Stony Creek and our revenue most months does not cover our operating costs in Stony Creek.

8. We have had preliminary discussions with our engineering consultant what modifications could be made to the plant and what results those changes would produce. Additional sampling and testing is needed at this time to obtain CBOD, TKN, and DO effluent values for a Model run for a set of limits we could meet. Therefore, we request that our permit be administratively continued for a period of time to allow us to complete this evaluation.

We welcome your response to this letter and if you have any questions in the process please contact Michael P. Kearns at (804)834-6903.

Respectfully submitted,

Michael P. Kearns

Michael P. Kearns
Engineer/Deputy Director

Frank H. Irving III
Executive Director

MEMORANDUM

DEPARTMENT OF ENVIRONMENTAL QUALITY

Piedmont Regional Office

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

DATE: April 27, 2016

TO: Frank Irving, Executive Director, Sussex Service Authority (SSA)
Michael Kearns, Deputy Director, SSA

FROM: Adam C. Eller, Water Permit Writer, DEQ-PRO

SUBJECT: VA0062669: Stony Creek Wastewater Treatment Facility; Agency Response to Owner Review of Draft Permit Reissuance

Date Received	#	Owner Comment	Agency Response
4/20/2016	**1.**	"Total Residual Chlorine (TRC) monitoring requirement (3 per day at 4 hour intervals) seems excessive for our small plant and will further stretch our operator's hours spent operating the plant. The SCAT Regulations appear to call for one per day. 9 VAC 25-790-960."	The SCAT regulation at 9VAC25-790-960 recommends the *minimum* sampling schedules for all municipal sewage treatment works; however, the 0.060 MGD facility TRC monitoring requirement of 3 per day at 4 hour intervals is based on DEQ Guidance Memo No. 14-2003 (revised March 27, 2014), which provides guidance for VPDES individual permit development and sets forth standard operating procedures for DEQ. DEQ is currently implementing the 3 per day at 4 hour intervals TRC sampling requirement statewide for all municipal sewage treatment plants where the design capacity of the plant is 0.041-0.1 MGD. As such, the sampling schedule is consistent with other VPDES permits for municipal sewage treatment works and is appropriate for the 0.060 MGD facility flow tier.

4/20/2016	**2.**	"We request that the Department add a provision stating that the Part I.B. 1 & 3 TRC 0.6 and 1.0 limits do not apply if an E.coli sample was pulled and the result was < 126. The permit should allow an E.coli sample within 1 hour of any result<0.6 (and <1.0); and if the result is <126, the result is not a permit violation and does not count against the 10% allowance."	The draft permit will be revised to include the following highlighted language at Part I.B.1.c: *"b. No more than **three** of all samples taken at the outlet of the chlorine contact tank shall be less than **1.0 mg/L** for any one calendar month (DMR parameter 157).* *c. No TRC sample collected at the outlet of any operating chlorine contact tank shall be less than **0.60 mg/L** (DMR parameter 213) unless the E. coli in the final effluent is also less than 126 N/100mL. When the TRC concentration after the contact tank and prior to dechlorination is less than 0.60 mg/L, an E. coli sample of the final effluent may be taken within 15 minutes. If the E. coli sample is taken within fifteen minutes and is less than 126 N/100 mL, then the original TRC samples shall not be reported as one of the three allowable excursions identified in B.1.b above."* The draft permit will also be revised to include the following highlighted language at Part I.B.3.c: *"b. No more than **nine** of all samples taken at the outlet of the chlorine contact tank shall be less than **1.0 mg/L** for any one calendar month (DMR parameter 157).* *c. No TRC sample collected at the outlet of any operating chlorine contact tank shall be less than **0.60 mg/L** (DMR parameter 213) unless the E. coli in the final effluent is also less than 126 N/100mL. When the TRC concentration after the contact tank and prior to dechlorination is less than 0.60 mg/L, an E. coli sample of the final effluent may be taken within 15 minutes. If the E. coli sample is taken within fifteen minutes and is less than 126 N/100 mL, then the original TRC samples shall not be reported as one of the nine allowable excursions identified in B.1.b above."*

4/20/2016	**3.**	"We request the Department remove the 85% TSS/BOD/CBOD removal requirement. We believe it to be inappropriate here where there are lower CBOD limits and a dilute influent."	Per the Secondary Treatment Regulation at 40 CFR Part 133.102, the 30-day average percent removal shall not be less than 85% for BOD_5, $cBOD_5$ and TSS. From June 2011 to October 2015 the 95th percentile value for the monthly average BOD_5 and TSS were approximately 28 mg/L and 23 mg/L respectively, which demonstrate that the treatment works is capable of meeting secondary treatment limits. Given that this facility is capable of meeting conventional secondary treatment, the 85% removal narrative language must be included in the permit unless, as specified at 40 CFR 133.103: "*(d. Less concentrated influent wastewater for separate sewers.) The Regional Administrator or, if appropriate, State Director is authorized to substitute either a lower percent removal requirement or a mass loading limit for the percent removal requirements set forth in §§133.102(a)(3), 133.102(a)(4)(iii), 133.102(b)(3), 102.105(a)(3), 133.105(b)(3) and 133.105(e)(1)(iii) provided that the permittee satisfactorily demonstrates that: (1) The treatment works is consistently meeting, or will consistently meet, its permit effluent concentration limits but its percent removal requirements cannot be met due to less concentrated influent wastewater, (2) to meet the percent removal requirements, the treatment works would have to achieve significantly more stringent limitations than would otherwise be required by the concentration-based standards, and (3) the less concentrated influent wastewater is not the result of excessive I/I. The determination of whether the less concentrated wastewater is the result of excessive I/I will use the definition of excessive I/I in 40 CFR 35.2005(b)(16) plus the additional criterion that inflow is nonexcessive if the total flow to the POTW (i.e., wastewater plus inflow plus infiltration) is less than 275 gallons per capita per day.*"

4/20/2016	**4.**	"We request that the Department write in seasonally tiered limits. For high stream flow months there may be a better chance of making the CBOD and TKN limits."	As discussed on the 4/27/2016 conference call between DEQ staff and Mike Kearns (SSA), inclusion of seasonally tiered limits would require that a new DEQ stream sanitation analysis model be generated, which may or may not provide the relief being sought and could even result in lower limitations due to recent low flow years in the receiving stream. DEQ is open to remodeling if this is specifically requested by SSA after reviewing this response to owner comments memorandum. Alternatively, a site-specific stream analysis may be performed at the permittee's expense. **Please confirm if SSA would like DEQ to perform a new stream sanitation analysis, or if SSA intends to have a site-specific analysis performed at the permittee's expense.**
4/20/2016	**5.**	"The CBOD and TKN limits for our existing plant will be very difficult to meet. We requested the 0.06 MGD tier to account for the increase in our influent to the plant. A good portion of this additional influent is coming from our water plant green sand filters which we currently have to backwash twice per week. We are working to address this matter and once corrected we might be able to only require a 0.05 MGD tier. What CBOD and TKN limits would this tier generate?"	To determine the $cBOD_5$ and TKN limitations for a 0.05 MGD, a new stream sanitation analysis would be required. DEQ will remodel the stream if that is SSA's desired path; however, as mentioned above, this may not provide the relief being sought. **Please confirm if SSA would like DEQ to perform a new stream sanitation analysis, or if SSA intends to have a site-specific analysis performed at the permittee's expense.**

4/20/2016	**6.**	"A flow of 60,000 GPD (41.67 GPM) mixing with a 7 Day, 10-Year Low Flow (7Q10) of 280,000GPD (194.44 GPM) is a considerable amount of dilution and should not produce such strict limits. We ask the Department to rerun the Regional Stream Model to check these limits."	The 2004 Stream Sanitation Analysis model is correct and is consistent with the conservative assumptions used for other DEQ stream sanitation analyses. To "rerun" the model would require that DEQ use the most current stream data. As mentioned during the 4/27/16 conference call, SSA can either opt to perform a site-specific model at the permittee's expense, or request that DEQ perform a new stream sanitation analysis, which may or may not provide less stringent limitations. **Please confirm if SSA would like DEQ to perform a new stream sanitation analysis, or if SSA intends to have a site-specific analysis performed at the permittee's expense.**
4/20/2016	**7.**	"We believe that our existing plant will not be able to meet these new limits without some type of plant modifications. Sussex Service Authority only has 122 customers in Stony Creek and our revenue most months does not cover our operating costs in Stony Creek."	As mentioned on the 4/27/16 conference call, we understand that funding may be limited for upgrades to meet the 0.06 MGD flow tier limits and recommend that SSA confer with Walter Gills (DEQ Financial Manager) to determine if there are any available grant funds or zero-interest loan opportunities that SSA can pursue.
4/20/2016	**8.**	"We have had preliminary discussions with our engineering consultant what modifications could be made to the plant and what results those changes would produce. Additional sampling and testing is needed at this time to obtain CBOD, TKN, and DO effluent values for a Model run for a set of limits we could meet. Therefore, we request that our permit be administratively continued for a period of time to allow us to complete this evaluation."	As discussed on the 4/27/16 conference call, the permit includes a 0.04 MGD flow tier for the existing 0.04 MGD treatment works; any sampling needed to determine appropriate upgrades/modifications for the 0.06 MGD flow tier may occur after the permit has been issued. Specific upgrades to meet permit limits will later be reviewed by DEQ as part of a certificate to construct (CTC) and certificate to operate (CTO), or as part of a preliminary engineering report (PER) evaluation (when state funds are involved). There is therefore, no need to delay the reissuance of the permit to accommodate additional $cBOD_5$, TKN and DO sampling.

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