APPENDIX A

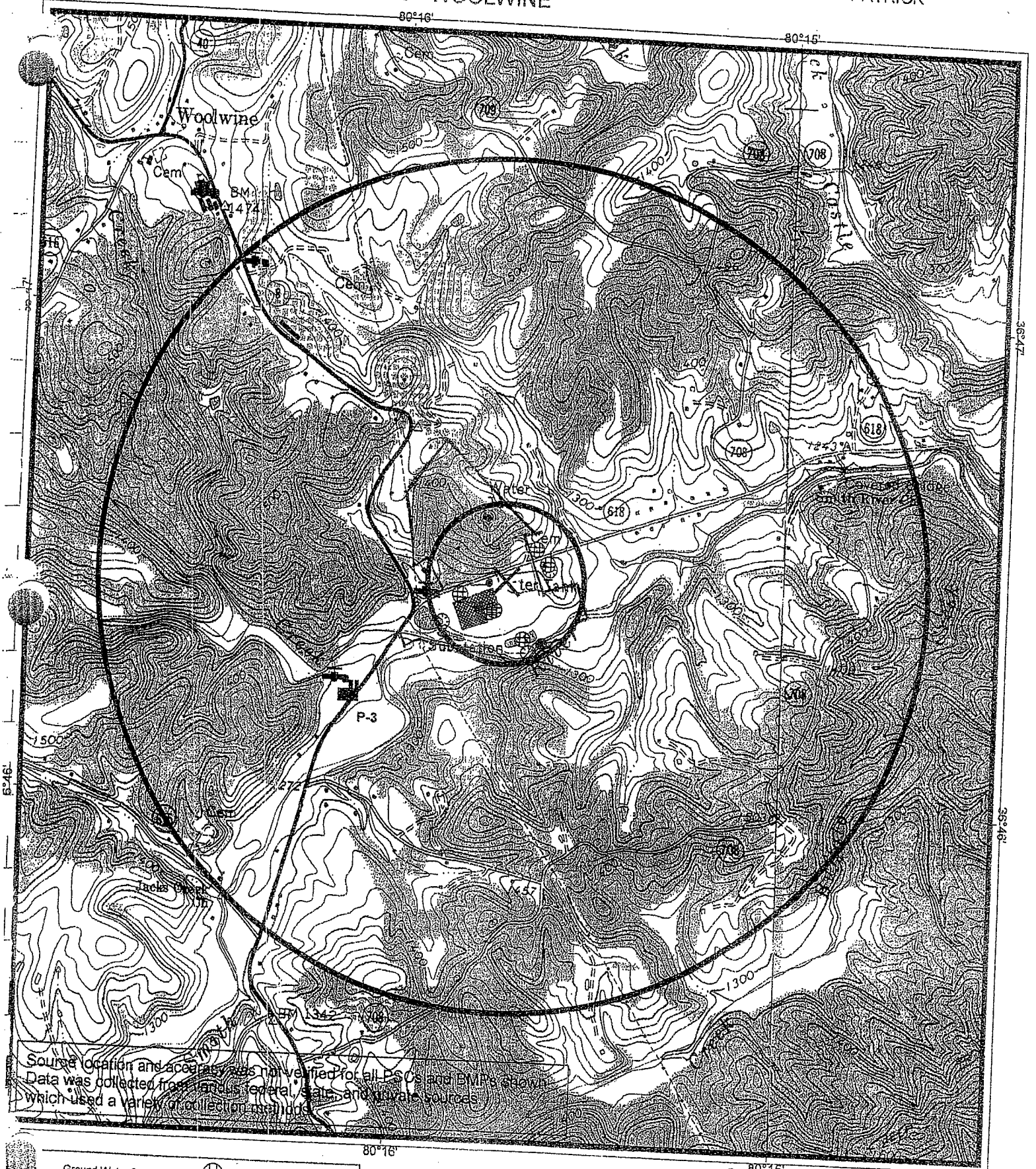
FACILITY INFORMATION

Site/Flow Diagram
USGS Map
Site Visit Memo
Flow Frequency Memo

SWAP Zone 2 Map

FACILITY:WELL NO. 3
WATERWORKS:LIBERTY FABRICS - WOOLWINE

DISTRICT 12B
COUNTY/CITY: PATRICK



Source location and accuracy was not verified for all PSCs and BMP's shown. Data was collected from local, federal, state, and private sources which used a variety of collection methods.

Ground Water Sources
Selected Water Source
LUA Polygons
PC Polygons
Land Use Activities (L-#)
Potential Conduits (C-#)
Best Management Practices (B-#)

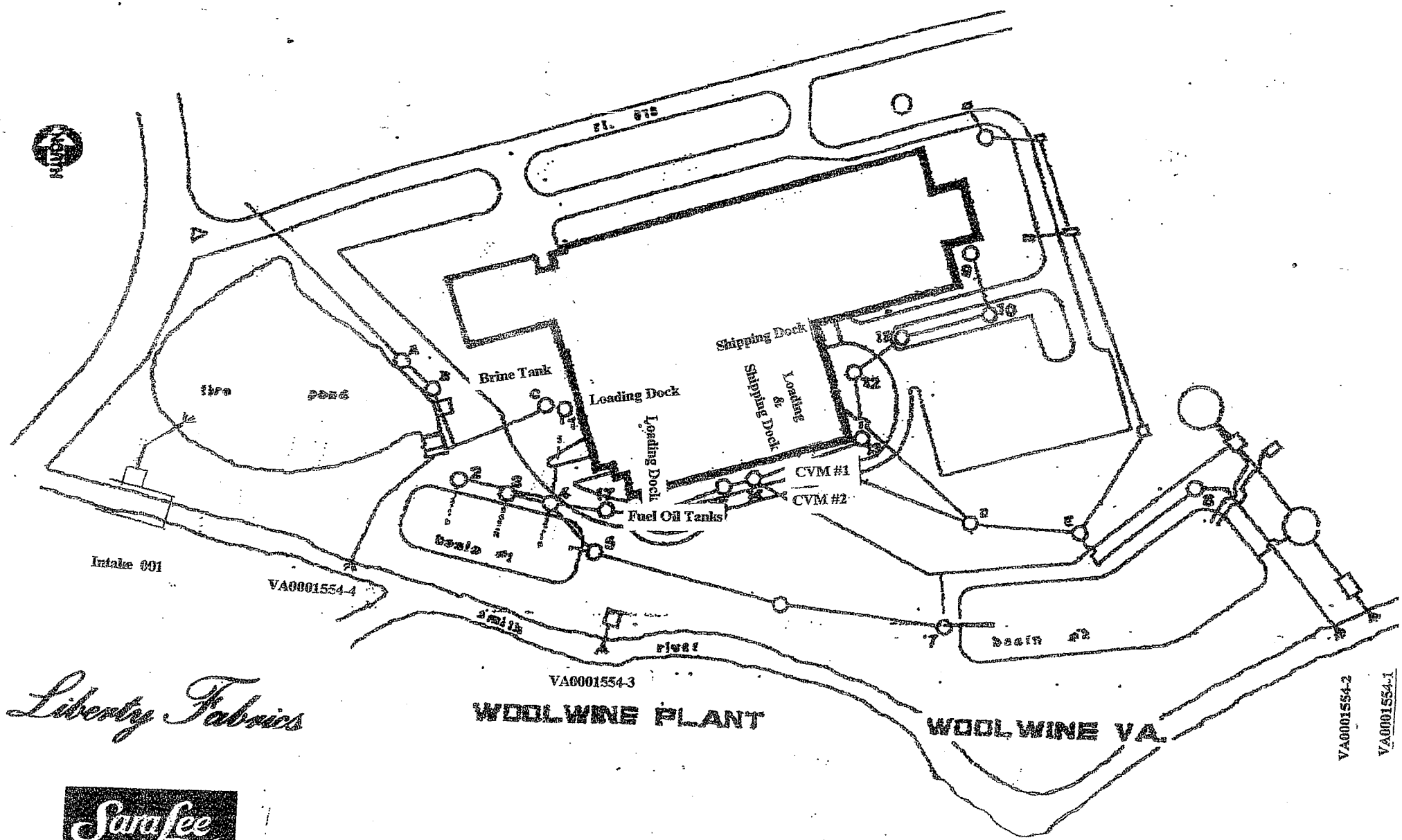
VDH VIRGINIA DEPARTMENT OF HEALTH
Protecting You and Your Environment
Division of Drinking Water

N
800 0 800 1600 Feet
Print Date:May 2002

Potential Sources of Contamination (P-#)

Landfills
Discharge – No Discharge Facilities
Discharge
No Discharge
DEQSWRO – Storage Tank Releases
Active
Closed

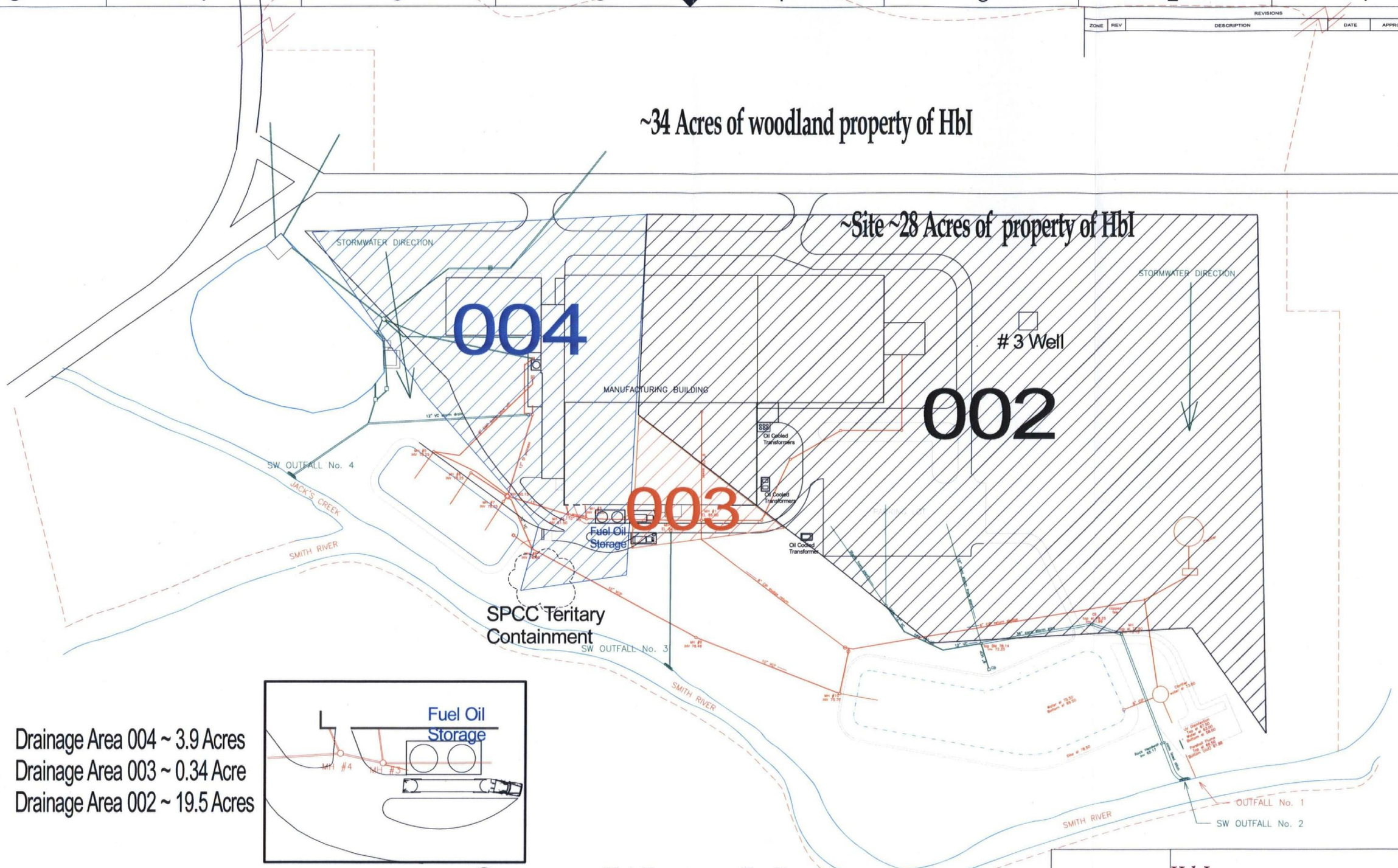
Airports
Industrial Sites
Superfund Sites
Golf Courses
Underground Injection Wells
Hazardous and RCRA Sites
Hospitals



Liberty Fabrics

Sara Lee

REVISIONS				
ZONE	REV	DESCRIPTION	DATE	APPROVED



Drainage Area 004 ~ 3.9 Acres
Drainage Area 003 ~ 0.34 Acre
Drainage Area 002 ~ 19.5 Acres

Storm Water Map

HbI
HANESbrandsINC
Woolwine Facility

DWG NO.

REV

SHEET

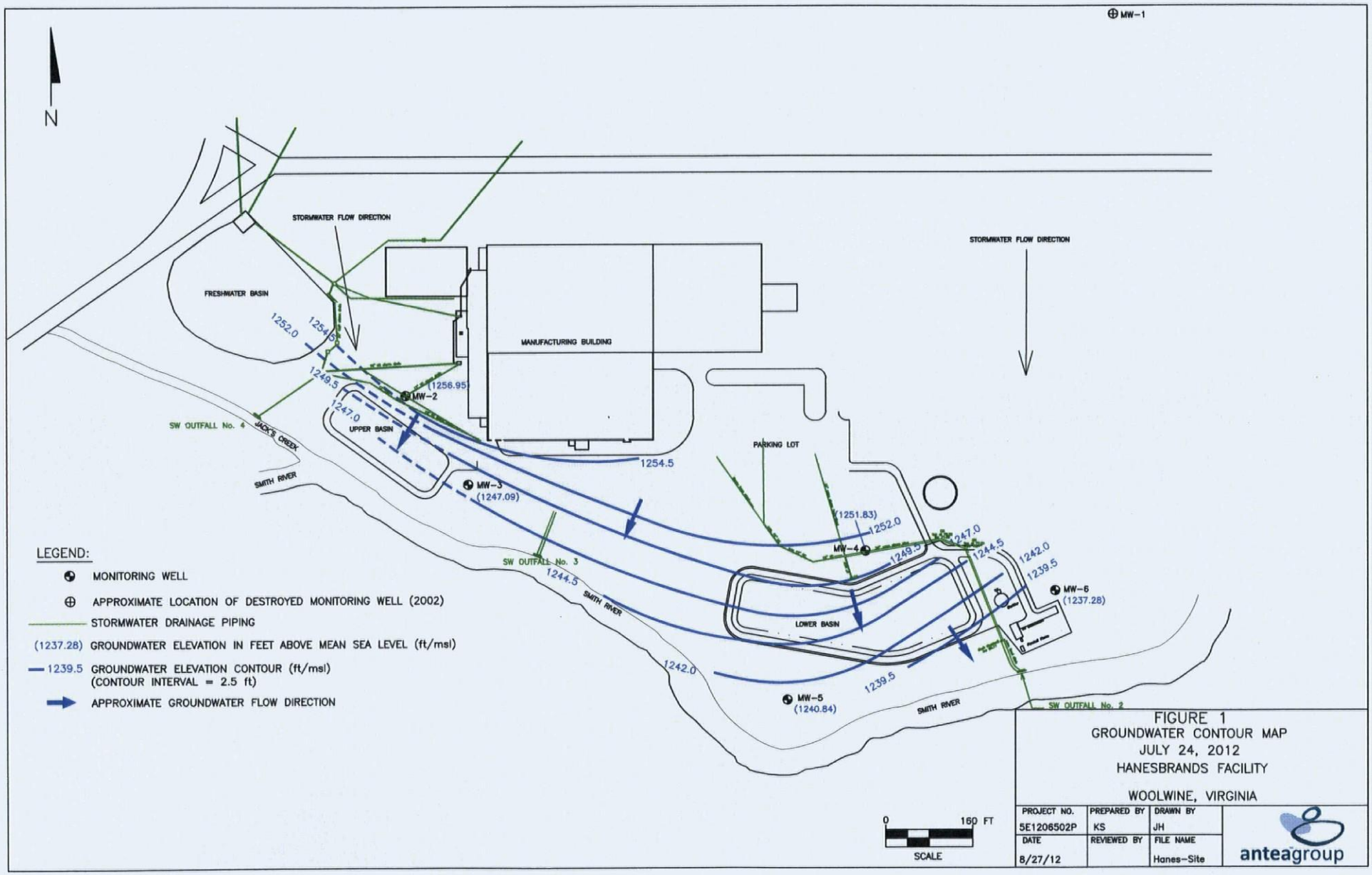
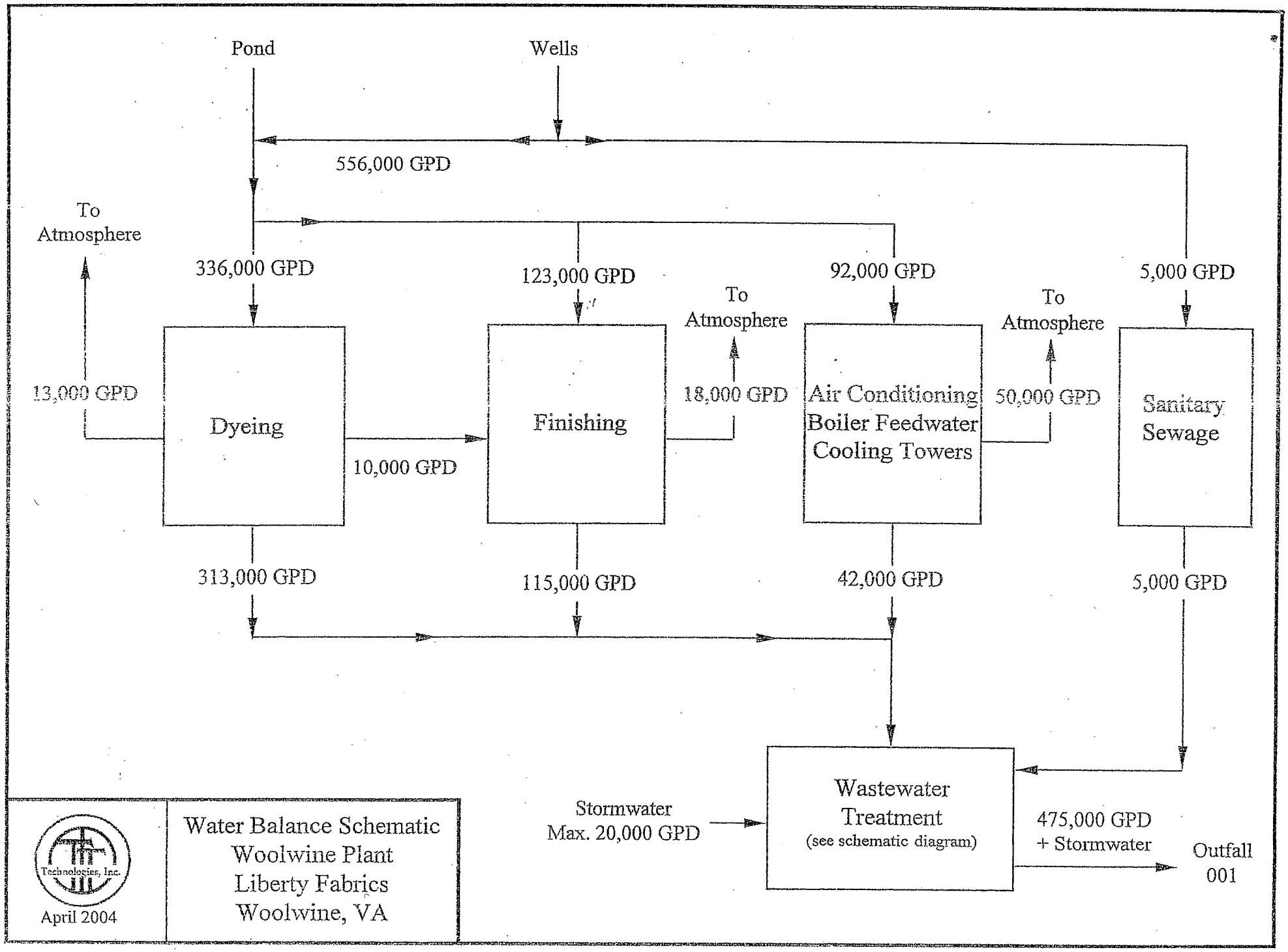


FIGURE 1
GROUNDWATER CONTOUR MAP
JULY 24, 2012
HANESBRANDS FACILITY

WOOLWINE, VIRGINIA

PROJECT NO.	PREPARED BY	DRAWN BY
5E1206502P	KS	JH
DATE	REVIEWED BY	FILE NAME
8/27/12		Hanes-Site


Pond
Wells
556,000 GPD
To Atmosphere
336,000 GPD
123,000 GPD
92,000 GPD
5,000 GPD
To Atmosphere
To Atmosphere
13,000 GPD
Dyeing
10,000 GPD
Finishing
18,000 GPD
Air Conditioning
Boiler Feedwater
Cooling Towers
50,000 GPD
Sanitary Sewage
313,000 GPD
115,000 GPD
42,000 GPD
5,000 GPD
Stormwater
Max. 20,000 GPD
Wastewater Treatment
(see schematic diagram)
475,000 GPD
+ Stormwater
Outfall 001
Technologies, Inc.
April 2004
Water Balance Schematic
Woolwine Plant
Liberty Fabrics
Woolwine, VA

Facility Name:Hanesbrands Incorporated
Permit No:VA0001554

Data from discharge monitoring reports

		FLOW, MGD			E. coli/100 ml		pH, SU		Temp	BOD	BOD	BOD	BOD	Cr, total	Cr, total	Cr, total	Cr, total
		Mo ave	Max	annual ave	geo mean	max	min	max	C	kg/d ave	kg/d max	mg/l ave	mg/l max	kg/d ave	kg/d max	mg/l ave	mg/l max
	Limit =>				*126*		*6.00*	*9.00*		*31*	*63*			*0.63*	*1.27*		
2012	1	0.2592	0.3862		1	3	7.33	8.2	14	<QL	<QL	<QL	<QL	0.031	0.031	0.037	0.037
	2	0.2666	0.3645		0	0	7.2	8.06	14	5	5	6	6	0.028	0.028	0.029	0.029
	3	0.2562	0.3136		2	11	7.26	7.81	19	<QL	<QL	<QL	<QL	0.029	0.029	0.027	0.027
	4	0.2467	0.3504		3	3	7.24	7.73	18	<QL	<QL	<QL	<QL	0.022	0.022	0.029	0.029
	5	0.2617	0.399		1	1	7.6	7.82	**22**	<QL	<QL	<QL	<QL	0.036	0.036	0.035	0.035
	6	0.2259	0.348		3	8	7.65	8.08	**24**	<QL	<QL	<QL	<QL	0.027	0.027	0.043	0.043
	7	0.205	0.3162		4	42	7.82	8.27	**25**	<QL	<QL	<QL	<QL	0.057	0.057	0.054	0.054
	8	0.2088	0.3225		1	1	7.66	8.24	**24**	<QL	<QL	<QL	<QL	0.030	0.030	0.049	0.049
	9	0.1043	0.3948		0	1	7.77	8.15	**24**	<QL	<QL	<QL	<QL	0.031	0.031	0.044	0.044
	10	0.2388	0.3482		2	13	7.58	8.4	**20**	1	4	1	5	0.056	0.056	0.064	0.064
	11	0.2481	0.3715		0	0	7.21	8.25	12	<QL	<QL	<QL	<QL	0.036	0.036	0.037	0.037
	12	0.2182	0.2792	0.228	0	1	7.27	8.22	12	<QL	<QL	<QL	<QL	0.020	0.020	0.023	0.023
		production from new machine started at beginning of 2013															
2013	1	0.205	0.3705		2	13	7.62	8.08	14	<QL	<QL	<QL	<QL	0.024	0.024	0.029	0.029
	2	0.2174	0.3324		5	31	7.71	8.14	9	3	10	4	14	0.013	0.013	0.020	0.020
	3	0.2258	0.3566		118	288	7.69	8.09	11	<QL	<QL	<QL	<QL	0.052	0.052	0.047	0.047
	4	0.2161	0.3146		14	119	7.63	8.07	20	<QL	<QL	<QL	<QL	0.057	0.057	0.080	0.080
	5	0.2526	0.4542		22	186	7.4	8.09	**23**	<QL	<QL	<QL	<QL	**0.109**	**0.109**	**0.146**	**0.146**
	6	0.2367	0.3338		17	980	7.2	8.05	**26**	<QL	<QL	<QL	<QL	0.066	0.066	0.068	0.068
	7	0.2773	0.4053		7	66	7.02	7.95	**26**	6	6	7	7	0.057	0.057	0.061	0.061
	8	0.3153	0.4043		2	3	7.24	8.04	**26**	<QL	<QL	<QL	<QL	0.055	0.055	0.060	0.060
	9	0.3005	0.4494		11	17	7	7.94	**26**	<QL	<QL	<QL	<QL	0.026	0.026	0.044	0.044
	10	0.2747	0.3547		16	179	7.32	8.06	**22**	<QL	<QL	<QL	<QL	0.024	0.024	0.026	0.026
	11	0.268	0.3794		3	15	7.21	8.04	18	<QL	<QL	<QL	<QL	0.020	0.020	0.025	0.025
	12	0.2646	0.4005	0.255	15	138	7.02	8.1	17	<QL	<QL	<QL	<QL	0.012	0.012	0.011	0.011
2014	1	0.2618	0.4085		5	36	7.02	7.86	10	<QL	<QL	<QL	<QL	0.011	0.011	0.012	0.012
	2	0.2942	0.3953		22	345	7.19	7.75	13	2	7	2	6	0.049	0.049	0.040	0.040
	3	0.2711	0.38		14	39	7.04	7.99	14	2	8	2	9	0.039	0.039	0.035	0.035
	4	0.2726	0.3912		5	22	7.38	7.88	18	3	13	2	10	0.052	0.052	0.041	0.041
	5	0.27	0.3712		4	16	7.25	7.77	**23**	<QL	<QL	<QL	<QL	0.051	0.051	0.051	0.051
	6	0.2762	0.3729		9	42	7.45	7.85	**25**	<QL	<QL	<QL	<QL	0.049	0.049	0.050	0.050
	7	0.2891	0.3467		13	167	7.31	7.83	**24**	<QL	<QL	<QL	<QL	0.061	0.061	0.050	0.050
	8	0.295	0.4121	0.279	6	46	7.69	8.04	**26**	<QL	<QL	<QL	<QL	0.042	0.042	0.041	0.041
	9	0.2838	0.4332	0.299	6	32	7.5	7.98	**24**	<QL	<QL	<QL	<QL	<0.029	<0.029	<0.037	<0.037
	10	0.3047	0.4478		7	20	7.6	7.92	**21**	<QL	<QL	<QL	<QL	0.042	0.042	0.036	0.036
	11	0.3043	0.4261		9	47	7.37	7.95	15	<QL	<QL	<QL	<QL	0.026	0.026	0.023	0.023
	12	0.3036	0.3899		7	68	7.46	7.77	12	2	6	2	5	0.011	0.011	0.009	0.009
2015	1	0.3291	0.452		34	1120	7.48	7.95	10	23	37	15	22	0.019	0.019	0.014	0.014
	2	0.2875	0.3741		21	184	7.59	8.07	11	10	20	10	18	0.015	0.015	0.012	0.012
	3	0.2659	0.3531		4	109	7.31	7.83	14	2	5	2	5	0.02	0.02	0.02	0.02
	4	0.2931	0.4824		13	579	7.46	7.85	19	2	9	3	10	<QL	<QL	<QL	<QL
	5	0.2585	0.3419		11	56	7.63	7.85	**22**	<QL	<QL	<QL	<QL	0.046	0.046	0.038	0.038
	6	0.2697	0.3509		6	13	7.55	7.86	**26**	1	5	1	5	0.045	0.045	0.038	0.038
	7	0.2528	0.355		2	3	7.63	7.98	**23**	<QL	<QL	<QL	<QL	0.038	0.038	0.028	0.028

Facility Name:Hanesbrands Incorporated
Permit No:VA0001554
Data from discharge monitoring reports

		COD kg/d ave/max	COD mg/L max	TSS kg/d ave/max	TSS mg/L max	Cr kg/d ave/max	Cr mg/L max	Sulfide kg/d ave/max	Sulfide* mg/L max		Chloride mg/L Att A
permit limit =>		*635/1270*	*NL*	*138/276*	*NL*	*0.63/1.27*	*NL*	*1.27/2.54*	*NL*		*NL*
		1/mo				1/mo		1/mo			***
2012	1	77	**93**	2	3	0.031	0.037	*<0.826*	*<1.00*	**	
	2	49	51	4	4	0.028	0.029	*<0.478*	*<0.500*	**	
	3	52	50	6	6	0.029	0.027	*<0.262*	*<0.250*	**	
	4	34	46	4	5	0.022	0.029	*<0.369*	*<0.50*	**	
	5	36	35	7	7	0.036	0.035	*<0.515*	*<0.50*	**	
	6	15	24	3	5	0.027	0.043	*<0.308*	*<0.50*	**	
	7	49	46	2	2	0.057	0.054	*<0.264*	*<0.25*	**	
	8	44	74	2	3	0.03	0.049	*<0.299*	*<0.50*	**	
	9	23	33	2	3	0.031	0.0443	*<0.137*	*<0.200*	**	
	10	35	40	5	6	0.056	0.064	*<0.433*	*<0.50*	**	
	11	37	39	<QL	<QL	0.036	0.037	*<0.478*	*<0.050*	**	
	12	40	46	3	3	0.02	0.023	*<0.219*	*<0.25*	**	
		production from new machine started at beginning of 2013									
2013	1	35	42	6	7	0.024	0.029	*<0.210*	*<0.25*	**	144
	2	28	47	2	4	0.013	0.02	*<0.15*	*<0.25*	**	147
	3	85	78	9	8	0.052	0.047	*<0.27*	*<0.25*	**	75
	4	63	89	4	6	0.057	0.08	*<0.177*	*<0.25*	**	46
	5	70	95	7	10	0.109	**0.146**	*<0.186*	*<0.25*	**	32
	6	97	**99**	10	10	0.066	0.068	*<0.24*	*<0.25*	**	30
	7	84	90	5	5	0.057	0.061	*<0.233*	*<0.25*	**	52
	8	58	63	8	9	0.055	0.06	*<0.23*	*<0.25*	**	256
	9	65	60	2	4	0.026	0.044	*<0.144*	*<0.25*	**	264
	10	48	52	5	5	0.024	0.026	*<0.23*	*<0.25*	**	274
	11	47	59	4	5	0.02	0.025	*<0.40*	*<0.50*	**	257
	12	45	45	5	5	0.012	0.011	0.43	0.42		196
											expected value 160
2014	1	33	38	5	6	0.011	0.012	*<0.22*	*<0.25*	**	
	2	144	**119**	22	18	0.049	0.04	*<0.303*	*<0.25*	**	
	3	119	106	21	19	0.039	0.035	*<0.28*	*<0.25*	**	
	4	85	67	14	11	0.052	0.041	*<0.317*	*<0.25*	**	
	5	73	74	8	8	0.051	0.051	*<0.25*	*<0.25*	**	
	6	69	71	15	15	0.049	0.05	*<0.24*	*<0.25*	**	
	7	80	66	13	11	0.061	0.05	*<0.305*	*<0.25*	**	
	8	46	45	5	5	0.042	0.041	*<0.25*	*<0.25*	**	
	9	43	56	5	6	<0.029	<0.037	*<0.193*	*<0.25*	**	
	10	31	27	16	14	0.042	0.036	*<0.289*	*<0.25*	**	
	11	56	51	4	4	0.026	0.023	*<0.274*	*<0.25*	**	
	12	48	41	7	6	0.011	0.009	*<0.29*	*<0.25*	**	
2015	1	**172**	**132**	10	8	0.019	0.014	1.048	0.85		
	2	111	93	10	8	0.015	0.012	*<0.599*	*<0.50*	**	
	3	95	97	18	18	0.02	0.02	*<0.25*	*<0.25*	**	
	4	68	62	28	26	<QL	<QL	<QL	<QL		
	5	80	66	27	22	0.046	0.038	0.061	0.05		REIC
	6	66	56	14	12	0.045	0.038	0.06	0.06		GEO-chem
	7	70	52	8	6	0.038	0.028	0.068	< 0.05		

* QL 0.05 mg/L required
** QL higher than required

*** water softening backwash rerouted July 2015

Facility Name:Hanesbrands Incorporated
Permit No:VA0001554

Data from discharge monitoring reports

Monitoring period			PHENOLICS, TOTAL RECOVERABLE				TPH	
from	to	due date:	kg/d ave	kg/d max	mg/l ave	mg/l max	mg/l ave	mg/l max
Apr-11	Sep-11	10-Oct-11	0.008	0.008	<0.005	<0.005	<QL	<QL
Oct-11	Mar-12	10-Apr-12	<0.010	<0.020	<0.008	<0.015	<QL	<QL
Apr-12	Sep-12	10-Oct-12	<QL	<QL	<QL	<QL	<QL	<QL
Oct-12	Mar-13	10-Apr-13	0.009	0.009	0.012	0.012	<QL	<QL
Apr-13	Sep-13	10-Oct-13	<QL	<QL	<QL	<QL	<QL	<QL
Oct-13	Mar-14	10-Apr-14	<0.011	<0.011	<0.01	<0.01	<QL	<QL
Apr-14	Sep-14	10-Oct-13	<QL	<QL	<QL	<QL	<QL	<QL
Oct-14	Mar-15	10-Apr-14	<QL	<QL	<QL	<QL	<QL	<QL

Hanesbrands pH values from DMRs

sorted monthly DMR data

1	8.4			
2	8.27			
3	8.25			
4	8.24			
5	8.22			
6	8.2			
7	**8.15**	**90%**		
8	8.14			
9	8.1			
10	8.09			
11	8.09		51	7.4
12	8.08		52	7.38
13	8.08		53	7.33
14	8.07		54	7.32
15	8.06		55	7.31
16	8.06		56	7.27
17	8.05		57	7.26
18	8.04		58	7.25
19	8.04		59	7.24
20	8.04		60	7.24
21	7.99		61	7.21
22	7.95		62	7.21
23	7.94		63	7.2
24	7.92		64	7.2
25	7.91		65	7.19
26	7.88		66	7.04
27	7.86		67	7.02
28	7.85		68	7.02
29	7.85		69	7.02
30	7.83		70	7
31	7.82			
32	7.82			
33	7.81			
34	7.77			
35	7.77			
36	7.75			
37	7.73			
38	7.71			
39	7.69			
40	7.69			
41	7.66			
42	7.65			
43	7.63			
44	7.62			
45	7.6			
46	7.59			
47	7.58			
48	7.46			
49	7.45			
50	7.42			

Hanesbrands Temp values from DMRs

sorted monthly DMR data

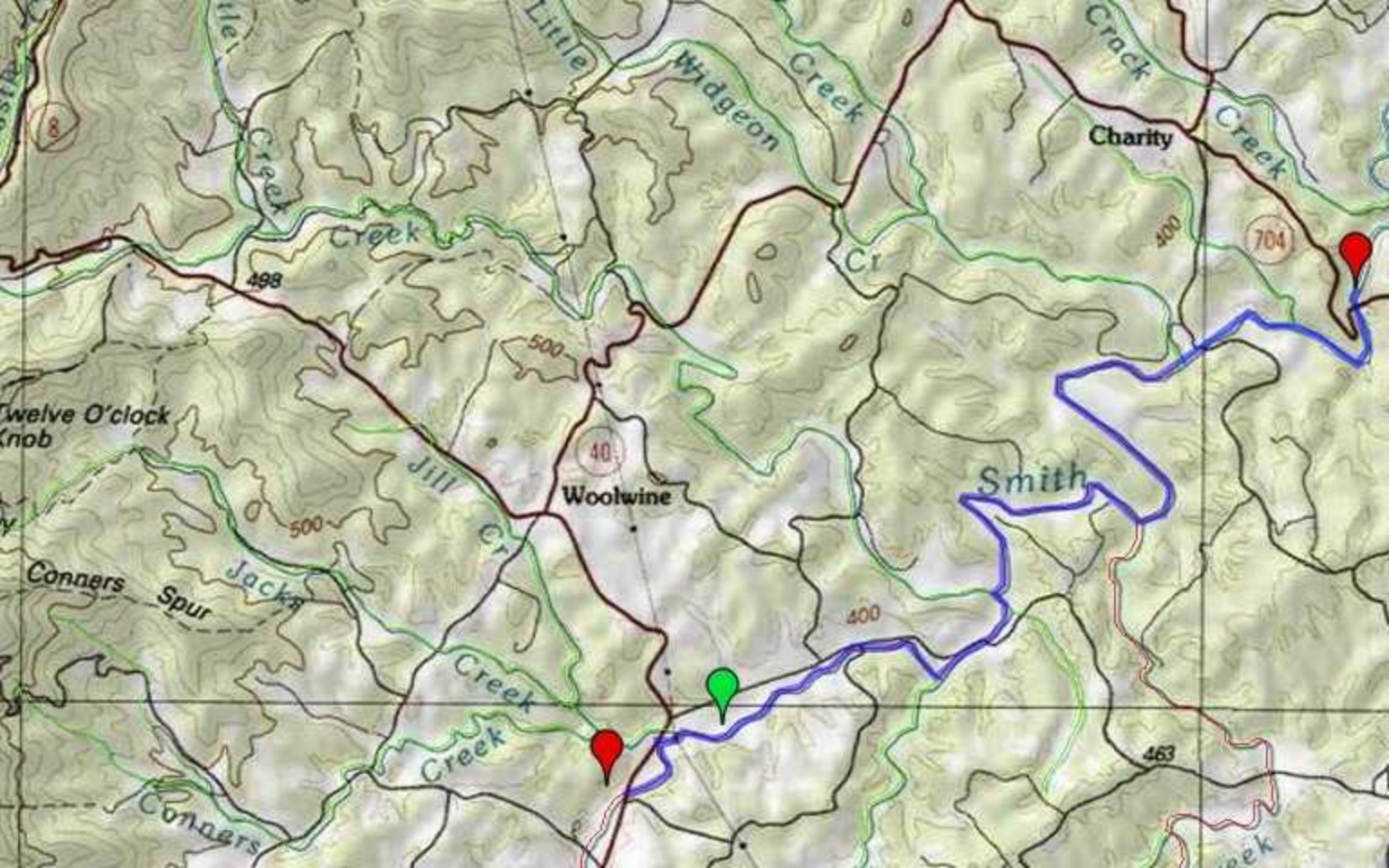
	Temp, C	rank
	26	1
	26	2
	26	3
90% =	**26**	4
	26	5
	25	6
	25	**7**
	25	8
	24	9
	24	10
	24	11
	24	12
	24	13
	23	14
	23	15
	22	16
	22	17
	20	18
	20	19
	19	20
	19	21
	18	22
	18	23
	18	24
	17	25
	15	26
	14	27
	14	28
	14	29
	14	30
	13	31
	13	32
	12	33
	12	34
	11	35
	10	36
	9	37

APPENDIX B

Receiving Stream information

Flow Frequency Documentation
STOReT Data

3f	IV	PWS	North Mayo River and South Mayo River and their tributaries from the Virginia-North Carolina state line to points 5 miles upstream.
3g	IV		Interstate streams in the Dan River watershed above the point where the Dan crosses the Virginia-North Carolina state line just east of Draper, N. C., (including the Mayo and the Smith watersheds), unless otherwise designated in this chapter.
	V		**Stockable Trout Waters in Section 3g**
	vi		Dan River from the Virginia-North Carolina state line upstream to the Pinnacles Power House.
	***		Little Dan River from its confluence with the Dan River 7.8 miles upstream.
	v		Smith River from river mile 61.14 (just below the confluence of Small Creek), to Route 704 (river mile 69.20).
	VI		**Natural Trout Waters in Section 3g**
	ii		Dan River from Pinnacles Power House to Townes Dam.
	ii		Dan River from headwaters of Townes Reservoir to Talbott Dam.
	iii		Little Dan River from 7.8 miles above its confluence with the Dan River upstream including all named and unnamed tributaries.
	i		North Prong of the North Fork Smith River from its confluence with the North Fork Smith River upstream including all named and unnamed tributaries.
	ii		North Fork Smith River from its confluence with the Smith River upstream including all named and unnamed tributaries.
	iii		Smith River from Route 704 (river mile 69.20) to Route 8 (river mile 77.55).
	ii		Smith River from Route 8 (approximate river mile 77.55) upstream including all named and unnamed tributaries.
	ii		South Mayo River from river mile 38.8 upstream including all named and unnamed tributaries.
3h	IV	PWS	South Mayo River and its tributaries from the Town of Stuart's raw water intake 0.4 mile upstream of its confluence with the North Fork Mayo River to points 5 miles upstream.
	VI		**Natural Trout Waters in Section 3h**
	iii		Brushy Fork from its confluence with the South Mayo River upstream including all named and unnamed tributaries.
	iii		Lily Cove Branch from its confluence with Rye Cove Creek upstream including all named and unnamed tributaries.
	iii		Rye Cove Creek from its confluence with the South Mayo River upstream including all named and unnamed tributaries.
	iii		South Mayo River from river mile 33.8 upstream including all named and unnamed tributaries.



Little
Widgeon
Creek
Crack
Creek
Charity
Creek
Creek
Cr
400
704
498
500
Twelve O'clock
Knob
40
Woolwine
Jill
Cr
Smith
500
Conners
Spur
Jacks
400
Creek
Creek
463
Conners

Critical low flows at Hanesbrands, Woolwine VA0001554

from USGS Low Flow Characteristics of Virginia Streams, Scientific Investigation Report 2011-5143

Index	Station number	Station description	T	Mean elevation (ft)	Drainage area (mi^2)	Number of complete climatic years	Number of years with zero flow	1Q10, cfs	7Q10, cfs	30Q5, cfs	30Q10, cfs
226	02071530	Smith River at Smith River Church (Route 708) near Woolwine, Va.	(p)	2304.9	26.3	11	0	5.28	6.29	9.74	8.13
			weighted					*5.21*	*6.21*	*9.61*	*8.03*
			p = log-Pearson type III								
							MGD =	3.412464	4.065227	6.294962	5.254419

Drainage area between outfall 001 and the gage is about 1.54 sq. mi.

26.3 - 1.54 = 24.76 sq. mi. cfs 4.97 5.92 9.17 7.65

OR 94.14% of gage area

convert to MGD 3.21 3.83 5.93 4.95

Gage is about one mile downstream of Hanesbrands outfall 001.

Effluent flow from 001 is subtracted from gage flow to obtain critical flows at outfall

max Mo ave flow = 0.333 MGD 2.88 3.49 5.59 4.61

1Q10 7Q10 30Q5 30Q10

Hanesbrands

Mix.exe variation

Smith River width per DEQ GIS, below outfall 20'-36'

use new critical flow data from Smith river gage 02071530, 5407' below outfall 001

bottom type 1 is silt and 5 is extremely rocky, normal stream channel assumed

width	Bottom scale	slope	est % mixing at 1Q10
20	**3**	**0.006**	**100**
25	**3**	**0.006**	**100**
26	**3**	**0.006**	**100**
27	**3**	**0.006**	**100**
28	**3**	**0.006**	**100**
29	3	0.006	93
30	3	0.006	85
35	3	0.006	54

width	Bottom sca	slope	est % mixing at 1Q10
20	**2**	**0.004**	**100**
25	**2**	**0.004**	**100**
26	2	0.004	100
27	2	0.004	84.6
29	2	0.004	68.7
30	2	0.004	62.2
35	2	0.004	39.7

20	**3**	**0.004**	**100**
25	**3**	**0.004**	**100**
26	**3**	**0.004**	**100**
27	**3**	**0.004**	**100**
28	**3**	**0.004**	**100**
29	3	0.004	91.7
30	3	0.004	83
35	3	0.004	53

20	**2**	**0.006**	**100**
25	**2**	**0.006**	**100**
26	**2**	**0.006**	**100**
27	2	0.006	86.2
29	2	0.006	70
30	2	0.006	63

Mixing Zone Predictions for Hanesbrands

Effluent Flow = 0.33 MGD
Stream 7Q10 = 3.49 MGD
Stream 30Q10 = 4.61 MGD
Stream 1Q10 = 2.88 MGD
Stream slope = 0.006 ft/ft
Stream width = 27 ft
Bottom scale = 2
Channel scale = 1

Mixing Zone Predictions @ 7Q10

Depth = .3258 ft
Length = 2398.58 ft
Velocity = .6723 ft/sec
Residence Time = .0413 days

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

Mixing Zone Predictions @ 30Q10

Depth = .3807 ft
Length = 2101.16 ft
Velocity = .7439 ft/sec
Residence Time = .0327 days

Recommendation:

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

Mixing Zone Predictions @ 1Q10

Depth = .2932 ft
Length = 2622.75 ft
Velocity = .6277 ft/sec
Residence Time = 1.1607 hours

Recommendation:

A complete mix assumption is appropriate for this situation providing no more than 86.15% of the 1Q10 is used.

Virginia DEQ Mixing Zone Analysis Version 2.1

Station ID 4ASRE075.69

Instream temp in last 10 years of record

Chronological Collection Date Time	Temp Celcius
01/10/2002 14:00	7.2
02/21/2002 14:00	10
03/14/2002 13:30	11.9
05/15/2002 11:50	14
06/19/2002 13:00	20.7
07/16/2002 14:35	**24.3**
08/20/2002 09:30	22.6
09/19/2002 11:30	20.7
10/22/2002 11:10	12.7
11/18/2002 12:35	8
12/19/2002 11:15	6.8
02/03/2003 12:30	6.3
02/13/2003 13:30	3
03/11/2003 13:00	6.3
04/16/2003 13:00	14.6
06/25/2003 14:30	17.9
08/04/2003 15:00	**20.4**
10/07/2003 14:00	18.7
12/03/2003 14:00	6.9
02/10/2004 13:30	6
04/05/2004 15:00	8.8
06/02/2004 14:00	17.9
08/02/2004 15:30	21.6
10/06/2004 14:30	14.7
12/08/2004 15:00	11.4
02/14/2005 12:35	8.41
04/21/2005 15:00	17.3
06/09/2005 14:30	20.5
08/25/2005 13:45	**21**
10/20/2005 13:40	17.2
12/14/2005 10:30	0.95
02/22/2006 11:00	6.5
04/13/2006 11:30	14.5
06/22/2006 13:00	22.1
08/29/2006 11:30	**22.5**
10/18/2006 10:00	13.3
12/13/2006 10:30	NULL
02/21/2007 15:30	10.3
04/12/2007 15:30	14.9
06/20/2007 15:00	21.7
08/02/2007 16:00	22.7
10/18/2007 15:00	17.9
02/28/2008 16:00	5.8
04/09/2008 15:00	13.8
06/24/2008 15:30	**21.9**
06/24/2008 15:31	NULL
08/28/2008 15:30	19.5
10/28/2008 16:00	8.7
12/22/2008 16:30	3
01/29/2009 15:30	6.3
03/31/2009 15:00	10.6
05/12/2009 15:00	15.8
07/30/2009 14:30	**20.3**
09/10/2009 15:30	17.8
11/23/2009 14:30	11.2
01/28/2010 14:00	9.4
03/09/2010 15:00	12.2
05/17/2010 14:30	15.7
07/29/2010 15:00	**25.2**
09/15/2010 15:00	20.3
11/22/2010 15:30	11.1
02/24/2011 15:30	6.7
04/13/2011 15:00	16.3
06/29/2011 14:30	22.5
08/25/2011 13:30	**23.6**
10/13/2011 14:30	17.6
12/29/2011 15:00	7.1
02/28/2012 14:00	11
03/14/2012 15:00	17.3
05/15/2012 14:30	17.3

	Collection Date Time	sorted by Temp Temp Celcius
1	07/29/2010 15:00	25.2
2	07/16/2002 14:35	24.3
3	08/25/2011 13:30	23.6
4	08/02/2007 16:00	22.7
5	08/20/2002 09:30	22.6
6	06/29/2011 14:30	22.5
7	**08/29/2006 11:30**	**22.5**
8	06/22/2006 13:00	22.1
9	06/24/2008 15:30	21.9
10	06/20/2007 15:00	21.7
11	08/02/2004 15:30	21.6
12	08/25/2005 13:45	21
13	09/19/2002 11:30	20.7
14	06/19/2002 13:00	20.7
15	06/09/2005 14:30	20.5
16	08/04/2003 15:00	20.4
17	09/15/2010 15:00	20.3
18	07/30/2009 14:30	20.3
19	08/28/2008 15:30	19.5
20	10/07/2003 14:00	18.7
21	10/18/2007 15:00	17.9
22	06/02/2004 14:00	17.9
23	06/25/2003 14:30	17.9
24	09/10/2009 15:30	17.8
25	10/13/2011 14:30	17.6
26	05/15/2012 14:30	17.3
27	03/14/2012 15:00	17.3
28	04/21/2005 15:00	17.3
29	10/20/2005 13:40	17.2
30	04/13/2011 15:00	16.3
31	05/12/2009 15:00	15.8
32	05/17/2010 14:30	15.7
33	04/12/2007 15:30	14.9
34	10/06/2004 14:30	14.7
35	04/16/2003 13:00	14.6
36	04/13/2006 11:30	14.5
37	05/15/2002 11:50	14
38	04/09/2008 15:00	13.8
39	10/18/2006 10:00	13.3
40	10/22/2002 11:10	12.7
41	03/09/2010 15:00	12.2
42	03/14/2002 13:30	11.9
43	12/08/2004 15:00	11.4
44	11/23/2009 14:30	11.2
45	11/22/2010 15:30	11.1
46	02/28/2012 14:00	11
47	03/31/2009 15:00	10.6
48	02/21/2007 15:30	10.3
49	02/21/2002 14:00	10
50	01/28/2010 14:00	9.4
51	04/05/2004 15:00	8.8
52	10/28/2008 16:00	8.7
53	02/14/2005 12:35	8.41
54	11/18/2002 12:35	8
55	01/10/2002 14:00	7.2
56	12/29/2011 15:00	7.1
57	12/03/2003 14:00	6.9
58	12/19/2002 11:15	6.8
59	02/24/2011 15:30	6.7
60	02/22/2006 11:00	6.5
61	01/29/2009 15:30	6.3
62	03/11/2003 13:00	6.3
63	02/03/2003 12:30	6.3
64	02/10/2004 13:30	6
65	02/28/2008 16:00	5.8
66	12/22/2008 16:30	3
67	02/13/2003 13:30	3
68	12/14/2005 10:30	0.95
69	06/24/2008 15:31	NULL
70	12/13/2006 10:30	NULL

12/29/2009 12:25:04 PM

Facility = STOReT Station 4ASRE075.69
Chemical = Chloride
Chronic averaging period = 4
WLAa = 860
WLAc = 230
Q.L. = 5
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 6
Expected Value = 12.4333
Variance = 55.6516
C.V. = 0.6
97th percentile daily values = 30.2554
97th percentile 4 day average = 20.6864
97th percentile 30 day average= 14.9952
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

No Limit is required for this material

The data are:

25.1
14
15.2
8.6
5
6.7

12/23/2009 11:27:17 AM

Facility = USGS 1994-5 data
Chemical = Dissolved Chromium Data
Chronic averaging period = 4
WLAa = 500
WLAc = 70
Q.L. = 0.5
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 11
Expected Value = .422073
Variance = .064132
C.V. = 0.6
97th percentile daily values = 1.02708
97th percentile 4 day average = .702242
97th percentile 30 day average= .509043
< Q.L. = 8
Model used = BPJ Assumptions, Type 1 data

No Limit is required for this material

The data are:

0.6
0
0.6
0
0
0.6
0
0
0
0
0

12/23/2009 11:32:40 AM

Facility = USGS stream data 1994 - 1995
Chemical = Dissolved Copper Data
Chronic averaging period = 4
WLAa = 9.9
WLAc = 8.1
Q.L. = 0.5
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 11
Expected Value = .286421
Variance = .029533
C.V. = 0.6
97th percentile daily values = .696983
97th percentile 4 day average = .476545
97th percentile 30 day average= .345439
< Q.L. = 10
Model used = BPJ Assumptions, Type 1 data

No Limit is required for this material

The data are:

0
0
0
0
0
0
0
0
0
0
0.9

12/23/2009 12:06:02 PM

Facility = USGS 1994-5 Data
Chemical = Dissolved Zinc Data
Chronic averaging period = 4
WLAa = 99
WLAc = 110
Q.L. = 0.5
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 11
Expected Value = .968696
Variance = .337814
C.V. = 0.6
97th percentile daily values = 2.35724
97th percentile 4 day average = 1.61170
97th percentile 30 day average= 1.16829
< Q.L. = 2
Model used = BPJ Assumptions, Type 1 data

No Limit is required for this material

The data are:

0
0
0.6
1.7
2
2.5
1
1.9
1.2
1.1
0.7

APPENDIX C

PERMIT LIMIT DEVELOPMENT

Waste Load Allocation Spreadsheet
STATS printouts

FRESHWATER
WATER QUALITY CRITERIA / WASTELOAD ALLOCATION ANALYSIS

Facility Name: Hanesbrands Permit No.: VA0001554

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

Stream Information

Mean Hardness (as CaCO3) =	25	mg/L
90% Temperature (Annual) =	22.5	deg C
90% Temperature (Wet season) =	22.5	deg C
90% Maximum pH =	8.1	SU
10% Maximum pH =	6.9	SU
Tier Designation (1 or 2) =	2	
Public Water Supply (PWS) Y/N? =	n	
Trout Present Y/N? =	y	
Early Life Stages Present Y/N? =	y	

Stream Flows

1Q10 (Annual) =	2.88	MGD
7Q10 (Annual) =	3.49	MGD
30Q10 (Annual) =	4.61	MGD
1Q10 (Wet season) =	2.88	MGD
30Q10 (Wet season)	4.61	MGD
30Q5 =	5.59	MGD
Harmonic Mean =	17	MGD

Mixing Information

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

Effluent Information

Mean Hardness (as CaCO3) =	25	mg/L
90% Temp (Annual) =	26	deg C
90% Temp (Wet season) =	16	deg C
90% Maximum pH =	8.14	SU
10% Maximum pH =	7.2	SU
Discharge Flow =	0.333	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	1.8E+04	--	--	na	9.9E+01	--	--	na	1.8E+03	**--**	**--**	**na**	**1.8E+03**
Acrolein	0	--	--	na	9.3E+00	--	--	na	1.7E+02	--	--	na	9.3E-01	--	--	na	1.7E+01	**--**	**--**	**na**	**1.7E+01**
Acrylonitrile[C]	0	--	--	na	2.5E+00	--	--	na	1.3E+02	--	--	na	2.5E-01	--	--	na	1.3E+01	**--**	**--**	**na**	**1.3E+01**
Aldrin [C]	0	3.0E+00	--	na	5.0E-04	2.9E+01	--	na	2.6E-02	7.5E-01	--	na	5.0E-05	7.2E+00	--	na	2.6E-03	**7.2E+00**	**--**	**na**	**2.6E-03**
Ammonia-N (mg/l) (Yearly)	0	4.61E+00	1.23E+00	na	--	4.44E+01	1.83E+01	na	--	1.15E+00	3.07E-01	na	--	1.11E+01	4.56E+00	na	--	**1.11E+01**	**4.56E+00**	**na**	**--**
Ammonia-N (mg/l) (High Flow)	0	4.61E+00	1.28E+00	na	--	4.44E+01	1.91E+01	na	--	1.15E+00	3.21E-01	na	--	1.11E+01	4.77E+00	na	--	**1.11E+01**	**4.77E+00**	**na**	**--**
Anthracene	0	--	--	na	4.0E+04	--	--	na	7.1E+05	--	--	na	4.0E+03	--	--	na	7.1E+04	**--**	**--**	**na**	**7.1E+04**
Antimony	0	--	--	na	6.4E+02	--	--	na	1.1E+04	--	--	na	6.4E+01	--	--	na	1.1E+03	**--**	**--**	**na**	**1.1E+03**
Arsenic	o	3.4E+02	1.5E+02	na	--	3.3E+03	1.7E+03	na	--	8.5E+01	3.8E+01	na	--	8.2E+02	4.3E+02	na	--	**8.2E+02**	**4.3E+02**	**na**	**--**
Barium	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	**--**	**--**	**na**	**--**
Benzene [C]	0	--	--	na	5.1E+02	--	--	na	2.7E+04	--	--	na	5.1E+01	--	--	na	2.7E+03	**--**	**--**	**na**	**2.7E+03**
Benzidine[C]	0	--	--	na	2.0E-03	--	--	na	1.0E-01	--	--	na	2.0E-04	--	--	na	1.0E-02	**--**	**--**	**na**	**1.0E-02**
Benzo (a) anthracene [C]	0	--	--	na	1.8E-01	--	--	na	9.4E+00	--	--	na	1.8E-02	--	--	na	9.4E-01	**--**	**--**	**na**	**9.4E-01**
Benzo (b) fluoranthene [C]	0	--	--	na	1.8E-01	--	--	na	9.4E+00	--	--	na	1.8E-02	--	--	na	9.4E-01	**--**	**--**	**na**	**9.4E-01**
Benzo (k) fluoranthene [C]	0	--	--	na	1.8E-01	--	--	na	9.4E+00	--	--	na	1.8E-02	--	--	na	9.4E-01	**--**	**--**	**na**	**9.4E-01**
Benzo (a) pyrene [C]	0	--	--	na	1.8E-01	--	--	na	9.4E+00	--	--	na	1.8E-02	--	--	na	9.4E-01	**--**	**--**	**na**	**9.4E-01**
Bis2-Chloroethyl Ether [C]	0	--	--	na	5.3E+00	--	--	na	2.8E+02	--	--	na	5.3E-01	--	--	na	2.8E+01	**--**	**--**	**na**	**2.8E+01**
Bis2-Chloroisopropyl Ether	0	--	--	na	6.5E+04	--	--	na	1.2E+06	--	--	na	6.5E+03	--	--	na	1.2E+05	**--**	**--**	**na**	**1.2E+05**
Bis 2-Ethylhexyl Phthalate [C]	0	--	--	na	2.2E+01	--	--	na	1.1E+03	--	--	na	2.2E+00	--	--	na	1.1E+02	**--**	**--**	**na**	**1.1E+02**
Bromoform [C]	0	--	--	na	1.4E+03	--	--	na	7.3E+04	--	--	na	1.4E+02	--	--	na	7.3E+03	**--**	**--**	**na**	**7.3E+03**
Butylbenzylphthalate	0	--	--	na	1.9E+03	--	--	na	3.4E+04	--	--	na	1.9E+02	--	--	na	3.4E+03	**--**	**--**	**na**	**3.4E+03**
Cadmium	0	8.2E-01	3.8E-01	na	--	7.9E+00	4.4E+00	na	--	2.1E-01	9.5E-02	na	--	2.0E+00	1.1E+00	na	--	**2.0E+00**	**1.1E+00**	**na**	**--**
Carbon Tetrachloride [C]	0	--	--	na	1.6E+01	--	--	na	8.3E+02	--	--	na	1.6E+00	--	--	na	8.3E+01	**--**	**--**	**na**	**8.3E+01**
Chlordane [C]	0	2.4E+00	4.3E-03	na	8.1E-03	2.3E+01	4.9E-02	na	4.2E-01	6.0E-01	1.1E-03	na	8.1E-04	5.8E+00	1.2E-02	na	4.2E-02	**5.8E+00**	**1.2E-02**	**na**	**4.2E-02**
Chloride	0	8.6E+05	2.3E+05	na	--	8.3E+06	2.6E+06	na	--	2.2E+05	5.8E+04	na	--	2.1E+06	6.6E+05	na	--	**2.1E+06**	**6.6E+05**	**na**	**--**
TRC	0	1.9E+01	1.1E+01	na	--	1.8E+02	1.3E+02	na	--	4.8E+00	2.8E+00	na	--	4.6E+01	3.2E+01	na	--	**4.6E+01**	**3.2E+01**	**na**	**--**
Chlorobenzene	0	--	--	na	1.6E+03	--	--	na	2.8E+04	--	--	na	1.6E+02	--	--	na	2.8E+03	**--**	**--**	**na**	**2.8E+03**

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				**Most Limiting Allocations**			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	**Acute**	**Chronic**	**HH (PWS)**	**HH**
Chlorodibromomethane[C]	0	--	--	na	1.3E+02	--	--	na	6.8E+03	--	--	na	1.3E+01	--	--	na	6.8E+02	**--**	**--**	**na**	**6.8E+02**
Chloroform	0	--	--	na	1.1E+04	--	--	na	2.0E+05	--	--	na	1.1E+03	--	--	na	2.0E+04	**--**	**--**	**na**	**2.0E+04**
2-Chloronaphthalene	0	--	--	na	1.6E+03	--	--	na	2.8E+04	--	--	na	1.6E+02	--	--	na	2.8E+03	**--**	**--**	**na**	**2.8E+03**
2-Chlorophenol	0	--	--	na	1.5E+02	--	--	na	2.7E+03	--	--	na	1.5E+01	--	--	na	2.7E+02	**--**	**--**	**na**	**2.7E+02**
Chlorpyrifos	0	8.3E-02	4.1E-02	na	--	8.0E-01	4.7E-01	na	--	2.1E-02	1.0E-02	na	--	2.0E-01	1.2E-01	na	--	**2.0E-01**	**1.2E-01**	**na**	**--**
Chromium III	0.422	1.8E+02	2.4E+01	na	--	1.8E+03	2.7E+02	na	--	4.6E+01	6.3E+00	na	--	4.4E+02	6.8E+01	na	--	**4.4E+02**	**6.8E+01**	**na**	**--**
Chromium VI	0	1.6E+01	1.1E+01	na	--	1.5E+02	1.3E+02	na	--	4.0E+00	2.8E+00	na	--	3.9E+01	3.2E+01	na	--	**3.9E+01**	**3.2E+01**	**na**	**--**
Chromium, Total	0	--	--	1.0E+02	--	--	--	na	--	--	--	1.0E+01	--	--	--	1.8E+02	--	**--**	**--**	**na**	**--**
Chrysene [C]	0	--	--	na	1.8E-02	--	--	na	9.4E-01	--	--	na	1.8E-03	--	--	na	9.4E-02	**--**	**--**	**na**	**9.4E-02**
Copper	0.286	3.6E+00	2.7E+00	na	--	3.3E+01	2.8E+01	na	--	1.1E+00	9.0E-01	na	--	8.4E+00	7.3E+00	na	--	**8.4E+00**	**7.3E+00**	**na**	**--**
Cyanide, Free	0	2.2E+01	5.2E+00	na	1.6E+04	2.1E+02	6.0E+01	na	2.8E+05	5.5E+00	1.3E+00	na	1.6E+03	5.3E+01	1.5E+01	na	2.8E+04	**5.3E+01**	**1.5E+01**	**na**	**2.8E+04**
DDD [C]	0	--	--	na	3.1E-03	--	--	na	1.6E-01	--	--	na	3.1E-04	--	--	na	1.6E-02	**--**	**--**	**na**	**1.6E-02**
DDE [C]	0	--	--	na	2.2E-03	--	--	na	1.1E-01	--	--	na	2.2E-04	--	--	na	1.1E-02	**--**	**--**	**na**	**1.1E-02**
DDT [C]	0	1.1E+00	1.0E-03	na	2.2E-03	1.1E+01	1.1E-02	na	1.1E-01	2.8E-01	2.5E-04	na	2.2E-04	2.7E+00	2.9E-03	na	1.1E-02	**2.7E+00**	**2.9E-03**	**na**	**1.1E-02**
Demeton	0	--	1.0E-01	na	--	--	1.1E+00	na	--	--	2.5E-02	na	--	--	2.9E-01	na	--	**--**	**2.9E-01**	**na**	**--**
Diazinon	0	1.7E-01	1.7E-01	na	--	1.6E+00	2.0E+00	na	--	4.3E-02	4.3E-02	na	--	4.1E-01	4.9E-01	na	--	**4.1E-01**	**4.9E-01**	**na**	**--**
Dibenz(a,h)anthracene [C]	0	--	--	na	1.8E-01	--	--	na	9.4E+00	--	--	na	1.8E-02	--	--	na	9.4E-01	**--**	**--**	**na**	**9.4E-01**
1,2-Dichlorobenzene	0	--	--	na	1.3E+03	--	--	na	2.3E+04	--	--	na	1.3E+02	--	--	na	2.3E+03	**--**	**--**	**na**	**2.3E+03**
1,3-Dichlorobenzene	0	--	--	na	9.6E+02	--	--	na	1.7E+04	--	--	na	9.6E+01	--	--	na	1.7E+03	**--**	**--**	**na**	**1.7E+03**
1,4-Dichlorobenzene	0	--	--	na	1.9E+02	--	--	na	3.4E+03	--	--	na	1.9E+01	--	--	na	3.4E+02	**--**	**--**	**na**	**3.4E+02**
3,3-Dichlorobenzidine[C]	0	--	--	na	2.8E-01	--	--	na	1.5E+01	--	--	na	2.8E-02	--	--	na	1.5E+00	**--**	**--**	**na**	**1.5E+00**
Dichlorobromomethane [C]	0	--	--	na	1.7E+02	--	--	na	8.8E+03	--	--	na	1.7E+01	--	--	na	8.8E+02	**--**	**--**	**na**	**8.8E+02**
1,2-Dichloroethane [C]	0	--	--	na	3.7E+02	--	--	na	1.9E+04	--	--	na	3.7E+01	--	--	na	1.9E+03	**--**	**--**	**na**	**1.9E+03**
1,1-Dichloroethylene	0	--	--	na	7.1E+03	--	--	na	1.3E+05	--	--	na	7.1E+02	--	--	na	1.3E+04	**--**	**--**	**na**	**1.3E+04**
1,2-trans-dichloroethylene	0	--	--	na	1.0E+04	--	--	na	1.8E+05	--	--	na	1.0E+03	--	--	na	1.8E+04	**--**	**--**	**na**	**1.8E+04**
2,4-Dichlorophenol	0	--	--	na	2.9E+02	--	--	na	5.2E+03	--	--	na	2.9E+01	--	--	na	5.2E+02	**--**	**--**	**na**	**5.2E+02**
2,4-Dichlorophenoxy acetic acid (2,4-D)	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	**--**	**--**	**na**	**--**
1,2-Dichloropropane[C]	0	--	--	na	1.5E+02	--	--	na	7.8E+03	--	--	na	1.5E+01	--	--	na	7.8E+02	**--**	**--**	**na**	**7.8E+02**
1,3-Dichloropropene [C]	0	--	--	na	2.1E+02	--	--	na	1.1E+04	--	--	na	2.1E+01	--	--	na	1.1E+03	**--**	**--**	**na**	**1.1E+03**
Dieldrin [C]	0	2.4E-01	5.6E-02	na	5.4E-04	2.3E+00	6.4E-01	na	2.8E-02	6.0E-02	1.4E-02	na	5.4E-05	5.8E-01	1.6E-01	na	2.8E-03	**5.8E-01**	**1.6E-01**	**na**	**2.8E-03**
Diethyl Phthalate	0	--	--	na	4.4E+04	--	--	na	7.8E+05	--	--	na	4.4E+03	--	--	na	7.8E+04	**--**	**--**	**na**	**7.8E+04**
2,4-Dimethylphenol	0	--	--	na	8.5E+02	--	--	na	1.5E+04	--	--	na	8.5E+01	--	--	na	1.5E+03	**--**	**--**	**na**	**1.5E+03**
Dimethyl Phthalate	0	--	--	na	1.1E+06	--	--	na	2.0E+07	--	--	na	1.1E+05	--	--	na	2.0E+06	**--**	**--**	**na**	**2.0E+06**
Di-n-Butyl Phthalate	0	--	--	na	4.5E+03	--	--	na	8.0E+04	--	--	na	4.5E+02	--	--	na	8.0E+03	**--**	**--**	**na**	**8.0E+03**
2,4 Dinitrophenol	0	--	--	na	5.3E+03	--	--	na	9.4E+04	--	--	na	5.3E+02	--	--	na	9.4E+03	**--**	**--**	**na**	**9.4E+03**
2-Methyl-4,6-Dinitrophenol	0	--	--	na	2.8E+02	--	--	na	5.0E+03	--	--	na	2.8E+01	--	--	na	5.0E+02	**--**	**--**	**na**	**5.0E+02**
2,4-Dinitrotoluene [C]	0	--	--	na	3.4E+01	--	--	na	1.8E+03	--	--	na	3.4E+00	--	--	na	1.8E+02	**--**	**--**	**na**	**1.8E+02**
Dioxin 2,3,7,8-tetrachlorodibenzo-p-dioxin	0	--	--	na	5.1E-08	--	--	na	9.1E-07	--	--	na	5.1E-09	--	--	na	9.1E-08	**--**	**--**	**na**	**9.1E-08**
1,2-Diphenylhydrazine[C]	0	--	--	na	2.0E+00	--	--	na	1.0E+02	--	--	na	2.0E-01	--	--	na	1.0E+01	**--**	**--**	**na**	**1.0E+01**
Alpha-Endosulfan	0	2.2E-01	5.6E-02	na	8.9E+01	2.1E+00	6.4E-01	na	1.6E+03	5.5E-02	1.4E-02	na	8.9E+00	5.3E-01	1.6E-01	na	1.6E+02	**5.3E-01**	**1.6E-01**	**na**	**1.6E+02**
Beta-Endosulfan	0	2.2E-01	5.6E-02	na	8.9E+01	2.1E+00	6.4E-01	na	1.6E+03	5.5E-02	1.4E-02	na	8.9E+00	5.3E-01	1.6E-01	na	1.6E+02	**5.3E-01**	**1.6E-01**	**na**	**1.6E+02**
Alpha + Beta Endosulfan	0	2.2E-01	5.6E-02	--	--	2.1E+00	6.4E-01	--	--	5.5E-02	1.4E-02	--	--	5.3E-01	1.6E-01	--	--	**5.3E-01**	**1.6E-01**	**--**	**--**
Endosulfan Sulfate	0	--	--	na	8.9E+01	--	--	na	1.6E+03	--	--	na	8.9E+00	--	--	na	1.6E+02	**--**	**--**	**na**	**1.6E+02**
Endrin	0	8.6E-02	3.6E-02	na	6.0E-02	8.3E-01	4.1E-01	na	1.1E+00	2.2E-02	9.0E-03	na	6.0E-03	2.1E-01	1.0E-01	na	1.1E-01	**2.1E-01**	**1.0E-01**	**na**	**1.1E-01**
Endrin Aldehyde	0	--	--	na	3.0E-01	--	--	na	5.3E+00	--	--	na	3.0E-02	--	--	na	5.3E-01	**--**	**--**	**na**	**5.3E-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	3.7E+04	--	--	na	2.1E+02	--	--	na	3.7E+03	**--**	**--**	**na**	**3.7E+03**
Fluoranthene	0	--	--	na	1.4E+02	--	--	na	2.5E+03	--	--	na	1.4E+01	--	--	na	2.5E+02	**--**	**--**	**na**	**2.5E+02**
Fluorene	0	--	--	na	5.3E+03	--	--	na	9.4E+04	--	--	na	5.3E+02	--	--	na	9.4E+03	**--**	**--**	**na**	**9.4E+03**
Foaming Agents	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	**--**	**--**	**na**	**--**
Guthion	0	--	1.0E-02	na	--	--	1.1E-01	na	--	--	2.5E-03	na	--	--	2.9E-02	na	--	**--**	**2.9E-02**	**na**	**--**
Heptachlor [C]	0	5.2E-01	3.8E-03	na	7.9E-04	5.0E+00	4.4E-02	na	4.1E-02	1.3E-01	9.5E-04	na	7.9E-05	1.3E+00	1.1E-02	na	4.1E-03	**1.3E+00**	**1.1E-02**	**na**	**4.1E-03**
Heptachlor Epoxide[C]	0	5.2E-01	3.8E-03	na	3.9E-04	5.0E+00	4.4E-02	na	2.0E-02	1.3E-01	9.5E-04	na	3.9E-05	1.3E+00	1.1E-02	na	2.0E-03	**1.3E+00**	**1.1E-02**	**na**	**2.0E-03**
Hexachlorobenzene[C]	0	--	--	na	2.9E-03	--	--	na	1.5E-01	--	--	na	2.9E-04	--	--	na	1.5E-02	**--**	**--**	**na**	**1.5E-02**
Hexachlorobutadiene[C]	0	--	--	na	1.8E+02	--	--	na	9.4E+03	--	--	na	1.8E+01	--	--	na	9.4E+02	**--**	**--**	**na**	**9.4E+02**
Hexachlorocyclohexane Alpha-BHC[C]	0	--	--	na	4.9E-02	--	--	na	2.6E+00	--	--	na	4.9E-03	--	--	na	2.6E-01	**--**	**--**	**na**	**2.6E-01**
Hexachlorocyclohexane Beta-BHC[C]	0	--	--	na	1.7E-01	--	--	na	8.8E+00	--	--	na	1.7E-02	--	--	na	8.8E-01	**--**	**--**	**na**	**8.8E-01**
Hexachlorocyclohexane Gamma-BHC[C] (Lindane)	0	9.5E-01	na	na	1.8E+00	9.2E+00	--	na	9.4E+01	2.4E-01	--	na	1.8E-01	2.3E+00	--	na	9.4E+00	**2.3E+00**	**--**	**na**	**9.4E+00**
Hexachlorocyclopentadiene	0	--	--	na	1.1E+03	--	--	na	2.0E+04	--	--	na	1.1E+02	--	--	na	2.0E+03	**--**	**--**	**na**	**2.0E+03**
Hexachloroethane[C]	0	--	--	na	3.3E+01	--	--	na	1.7E+03	--	--	na	3.3E+00	--	--	na	1.7E+02	**--**	**--**	**na**	**1.7E+02**
Hydrogen Sulfide	0	--	2.0E+00	na	--	--	2.3E+01	na	--	--	5.0E-01	na	--	--	5.7E+00	na	--	**--**	**5.7E+00**	**na**	**--**
Indeno (1,2,3-cd) pyrene [C]	0	--	--	na	1.8E-01	--	--	na	9.4E+00	--	--	na	1.8E-02	--	--	na	9.4E-01	**--**	**--**	**na**	**9.4E-01**
Iron	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	**--**	**--**	**na**	**--**
Isophorone[C]	0	--	--	na	9.6E+03	--	--	na	5.0E+05	--	--	na	9.6E+02	--	--	na	5.0E+04	**--**	**--**	**na**	**5.0E+04**
Kepone	0	--	0.0E+00	na	--	--	0.0E+00	na	--	--	0.0E+00	na	--	--	0.0E+00	na	--	**--**	**0.0E+00**	**na**	**--**
Lead	0	2.0E+01	2.3E+00	na	--	2.0E+02	2.7E+01	na	--	5.1E+00	5.8E-01	na	--	4.9E+01	6.6E+00	na	--	**4.9E+01**	**6.6E+00**	**na**	**--**
Malathion	0	--	1.0E-01	na	--	--	1.1E+00	na	--	--	2.5E-02	na	--	--	2.9E-01	na	--	**--**	**2.9E-01**	**na**	**--**
Manganese	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	**--**	**--**	**na**	**--**
Mercury	0	1.4E+00	7.7E-01	- -	- -	1.4E+01	8.8E+00	- -	- -	3.5E-01	1.9E-01	- -	--	3.4E+00	2.2E+00	- -	--	**3.4E+00**	**2.2E+00**	**- -**	**- -**
Methyl Bromide	0	--	--	na	1.5E+03	--	--	na	2.7E+04	--	--	na	1.5E+02	--	--	na	2.7E+03	**--**	**--**	**na**	**2.7E+03**
Methylene Chloride [C]	0	--	--	na	5.9E+03	--	--	na	3.1E+05	--	--	na	5.9E+02	--	--	na	3.1E+04	**--**	**--**	**na**	**3.1E+04**
Methoxychlor	0	--	3.0E-02	na	--	--	3.4E-01	na	--	--	7.5E-03	na	--	--	8.6E-02	na	--	**--**	**8.6E-02**	**na**	**--**
Mirex	0	--	0.0E+00	na	--	--	0.0E+00	na	--	--	0.0E+00	na	--	--	0.0E+00	na	--	**--**	**0.0E+00**	**na**	**--**
Nickel	0	5.6E+01	6.3E+00	na	4.6E+03	5.4E+02	7.2E+01	na	8.2E+04	1.4E+01	1.6E+00	na	4.6E+02	1.4E+02	1.8E+01	na	8.2E+03	**1.4E+02**	**1.8E+01**	**na**	**8.2E+03**
Nitrate (as N)	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	**--**	**--**	**na**	**--**
Nitrobenzene	0	--	--	na	6.9E+02	--	--	na	1.2E+04	--	--	na	6.9E+01	--	--	na	1.2E+03	**--**	**--**	**na**	**1.2E+03**
N-Nitrosodimethylamine[C]	0	--	--	na	3.0E+01	--	--	na	1.6E+03	--	--	na	3.0E+00	--	--	na	1.6E+02	**--**	**--**	**na**	**1.6E+02**
N-Nitrosodiphenylamine[C]	0	--	--	na	6.0E+01	--	--	na	3.1E+03	--	--	na	6.0E+00	--	--	na	3.1E+02	**--**	**--**	**na**	**3.1E+02**
N-Nitrosodi-n-propylamine[C]	0	--	--	na	5.1E+00	--	--	na	2.7E+02	--	--	na	5.1E-01	--	--	na	2.7E+01	**--**	**--**	**na**	**2.7E+01**
Nonylphenol	0	2.8E+01	6.6E+00	--	--	2.7E+02	7.6E+01	na	--	7.0E+00	1.7E+00	--	--	6.8E+01	1.9E+01	--	--	**6.8E+01**	**1.9E+01**	**na**	**--**
Parathion	0	6.5E-02	1.3E-02	na	--	6.3E-01	1.5E-01	na	--	1.6E-02	3.3E-03	na	--	1.6E-01	3.7E-02	na	--	**1.6E-01**	**3.7E-02**	**na**	**--**
PCB Total[C]	0	--	1.4E-02	na	6.4E-04	--	1.6E-01	na	3.3E-02	--	3.5E-03	na	6.4E-05	--	4.0E-02	na	3.3E-03	**--**	**4.0E-02**	**na**	**3.3E-03**
Pentachlorophenol [C]	0	8.1E+00	6.2E+00	na	3.0E+01	7.8E+01	7.1E+01	na	1.6E+03	2.0E+00	1.5E+00	na	3.0E+00	1.9E+01	1.8E+01	na	1.6E+02	**1.9E+01**	**1.8E+01**	**na**	**1.6E+02**
Phenol	0	--	--	na	8.6E+05	--	--	na	1.5E+07	--	--	na	8.6E+04	--	--	na	1.5E+06	**--**	**--**	**na**	**1.5E+06**
Pyrene	0	--	--	na	4.0E+03	--	--	na	7.1E+04	--	--	na	4.0E+02	--	--	na	7.1E+03	**--**	**--**	**na**	**7.1E+03**
Radionuclides	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	**--**	**--**	**na**	**--**
Gross Alpha Activity (pCi/L)	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	**--**	**--**	**na**	**--**
Beta and Photon Activity (mrem/yr)	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	**--**	**--**	**na**	**--**
Radium 226 + 228 (pCi/L)	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	**--**	**--**	**na**	**--**
Uranium (ug/l)	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	**--**	**--**	**na**	**--**

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				**Most Limiting Allocations**			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	**Acute**	**Chronic**	**HH (PWS)**	**HH**
Selenium, Total Recoverable	0	2.0E+01	5.0E+00	na	4.2E+03	1.9E+02	5.7E+01	na	7.5E+04	5.0E+00	1.3E+00	na	4.2E+02	4.8E+01	1.4E+01	na	7.5E+03	**4.8E+01**	**1.4E+01**	**na**	**7.5E+03**
Silver	0	3.2E-01	--	na	--	3.1E+00	--	na	--	7.9E-02	--	na	--	7.7E-01	--	na	--	**7.7E-01**	**--**	**na**	**--**
Sulfate	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	**--**	**--**	**na**	**--**
1,1,2,2-Tetrachloroethane[C]	0	--	--	na	4.0E+01	--	--	na	2.1E+03	--	--	na	4.0E+00	--	--	na	2.1E+02	**--**	**--**	**na**	**2.1E+02**
Tetrachloroethylene[C]	0	--	--	na	3.3E+01	--	--	na	1.7E+03	--	--	na	3.3E+00	--	--	na	1.7E+02	**--**	**--**	**na**	**1.7E+02**
Thallium	0	--	--	na	4.7E-01	--	--	na	8.4E+00	--	--	na	4.7E-02	--	--	na	8.4E-01	**--**	**--**	**na**	**8.4E-01**
Toluene	0	--	--	na	6.0E+03	--	--	na	1.1E+05	--	--	na	6.0E+02	--	--	na	1.1E+04	**--**	**--**	**na**	**1.1E+04**
Total dissolved solids	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	**--**	**--**	**na**	**--**
Toxaphene [C]	0	7.3E-01	2.0E-04	na	2.8E-03	7.0E+00	2.3E-03	na	1.5E-01	1.8E-01	5.0E-05	na	2.8E-04	1.8E+00	5.7E-04	na	1.5E-02	**1.8E+00**	**5.7E-04**	**na**	**1.5E-02**
Tributyltin	0	4.6E-01	7.2E-02	na	--	4.4E+00	8.3E-01	na	--	1.2E-01	1.8E-02	na	--	1.1E+00	2.1E-01	na	--	**1.1E+00**	**2.1E-01**	**na**	**--**
1,2,4-Trichlorobenzene	0	--	--	na	7.0E+01	--	--	na	1.2E+03	--	--	na	7.0E+00	--	--	na	1.2E+02	**--**	**--**	**na**	**1.2E+02**
1,1,2-Trichloroethane[C]	0	--	--	na	1.6E+02	--	--	na	8.3E+03	--	--	na	1.6E+01	--	--	na	8.3E+02	**--**	**--**	**na**	**8.3E+02**
Trichloroethylene [C]	0	--	--	na	3.0E+02	--	--	na	1.6E+04	--	--	na	3.0E+01	--	--	na	1.6E+03	**--**	**--**	**na**	**1.6E+03**
2,4,6-Trichlorophenol [C]	0	--	--	na	2.4E+01	--	--	na	1.2E+03	--	--	na	2.4E+00	--	--	na	1.2E+02	**--**	**--**	**na**	**1.2E+02**
2-(2,4,5-Trichlorophenoxy) propionic acid (Silvex)	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	**--**	**--**	**na**	**--**
Vinyl Chloride[C]	0	--	--	na	2.4E+01	--	--	na	1.2E+03	--	--	na	2.4E+00	--	--	na	1.2E+02	**--**	**--**	**na**	**1.2E+02**
Zinc	0.969	3.6E+01	3.6E+01	na	2.6E+04	3.4E+02	4.1E+02	na	4.6E+05	9.8E+00	9.9E+00	na	2.6E+03	8.6E+01	1.0E+02	na	4.6E+04	**8.6E+01**	**1.0E+02**	**na**	**4.6E+04**

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	1.1E+03
Arsenic	2.6E+02
Barium	na
Cadmium	6.6E-01
Chromium III	4.1E+01
Chromium VI	1.5E+01
Copper	3.4E+00
Iron	na
Lead	4.0E+00
Manganese	na
Mercury	1.3E+00
Nickel	1.1E+01
Selenium	8.6E+00
Silver	3.1E-01
Zinc	3.4E+01

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

0.333 MGD DISCHARGE FLOW - STREAM MIX PER "Mix.exe"

Discharge Flow Used for WQS-WLA Calculations (MGI 0.333

	Stream Flows Allocated to Mix (MGD)		Total Mix Flows Stream + Discharge (MGD)	
	Dry Season	Wet Season	Dry Season	Wet Season
1Q10	2.880	2.880	3.213	3.213
7Q10	3.490	N/A	3.823	N/A
30Q10	4.610	4.610	4.943	4.943
30Q5	5.590	N/A	5.923	N/A
Harm. Mean	17.000	N/A	17.333	N/A
Annual Avg.	0.000	N/A	0.333	N/A

Stream/Discharge Mix Values

	Dry Season	Wet Season
1Q10 90th% Temp. Mix (deg C)	22.863	21.826
30Q10 90th% Temp. Mix (deg C)	22.736	22.062
1Q10 90th% pH Mix (SU)	8.104	8.104
30Q10 90th% pH Mix (SU)	8.103	8.103
1Q10 10th% pH Mix (SU)	6.923	N/A
7Q10 10th% pH Mix (SU)	6.919	N/A

	Calculated	Formula Inputs
1Q10 Hardness (mg/L as CaCO3)	25.0	25.0
7Q10 Hardness (mg/L as CaCO3)	25.0	25.0

Ammonia - Dry Season - Acute

90th Percentile pH (SU)	8.104
(7.204 - pH)	-0.900
(pH - 7.204)	0.900
Trout Present Criterion (mg N/l	4.605
Trout Absent Criterion (mg N/L	6.895
Trout Present?	y
Effective Criterion (mg N/L)	4.605

Ammonia - Dry Season - Chronic

90th Percentile Temp. (deg C)	22.736
90th Percentile pH (SU)	8.103
MIN	1.678
MAX	22.736
(7.688 - pH)	-0.415
(pH - 7.688)	0.415
Early LS Present Criterion (mg N	1.230
Early LS Absent Criterion (mg N/	1.230
Early Life Stages Present?	y
Effective Criterion (mg N/L)	1.230

Ammonia - Wet Season - Acute

90th Percentile pH (SU)	8.104
(7.204 - pH)	-0.900
(pH - 7.204)	0.900
Trout Present Criterion (mg N/l	4.605
Trout Absent Criterion (mg N/L	6.895
Trout Present?	y
Effective Criterion (mg N/L)	4.605

Ammonia - Wet Season - Chronic

90th Percentile Temp. (deg C)	22.062
90th Percentile pH (SU)	8.103
MIN	1.752
MAX	22.062
(7.688 - pH)	-0.415
(pH - 7.688)	0.415
Early LS Present Criterion (mg N	1.284
Early LS Absent Criterion (mg N/	1.284
Early Life Stages Present?	y
Effective Criterion (mg N/L)	1.284

0.333 MGD DISCHARGE FLOW - COMPLETE STREAM MIX

Discharge Flow Used for WQS-WLA Calculations (MGI 0.333

	100% Stream Flows Allocated to Mix (MGD)		Total Mix Flows Stream + Discharge (MGD)	
	Dry Season	Wet Season	Dry Season	Wet Season
1Q10	2.880	2.880	3.213	3.213
7Q10	3.490	N/A	3.823	N/A
30Q10	4.610	4.610	4.943	4.943
30Q5	5.590	N/A	5.923	N/A
Harm. Mean	17.000	N/A	17.333	N/A
Annual Avg.	0.000	N/A	0.333	N/A

Stream/Discharge Mix Values

	Dry Season	Wet Season
1Q10 90th% Temp. Mix (deg C)	22.863	21.826
30Q10 90th% Temp. Mix (deg C)	22.736	22.062
1Q10 90th% pH Mix (SU)	8.104	8.104
30Q10 90th% pH Mix (SU)	8.103	8.103
1Q10 10th% pH Mix (SU)	6.923	N/A
7Q10 10th% pH Mix (SU)	6.919	N/A

	Calculated	Formula Inputs
1Q10 Hardness (mg/L as CaCO3) =	25.000	25.000
7Q10 Hardness (mg/L as CaCO3) =	25.000	25.000

Ammonia - Dry Season - Acute

90th Percentile pH (SU)	8.104
(7.204 - pH)	-0.900
(pH - 7.204)	0.900
Trout Present Criterion (mg N/l	4.605
Trout Absent Criterion (mg N/L	6.895
Trout Present?	y
Effective Criterion (mg N/L)	4.605

Ammonia - Dry Season - Chronic

90th Percentile Temp. (deg C)	22.736
90th Percentile pH (SU)	8.103
MIN	1.678
MAX	22.736
(7.688 - pH)	-0.415
(pH - 7.688)	0.415
Early LS Present Criterion (mg N	1.230
Early LS Absent Criterion (mg N/	1.230
Early Life Stages Present?	y
Effective Criterion (mg N/L)	1.230

Ammonia - Wet Season - Acute

90th Percentile pH (SU)	8.104
(7.204 - pH)	-0.900
(pH - 7.204)	0.900
Trout Present Criterion (mg N/l	4.605
Trout Absent Criterion (mg N/L	6.895
Trout Present?	y
Effective Criterion (mg N/L)	4.605

Ammonia - Wet Season - Chronic

90th Percentile Temp. (deg C)	22.062
90th Percentile pH (SU)	8.103
MIN	1.752
MAX	22.062
(7.688 - pH)	-0.415
(pH - 7.688)	0.415
Early LS Present Criterion (mg N	1.284
Early LS Absent Criterion (mg N/	1.284
Early Life Stages Present?	y
Effective Criterion (mg N/L)	1.284

Federal Effluent Guideline Limitations

BOD_5: max = 5 lbs/1000 lbs product/day (BPT) 40CFR410.52
= 5 x 28 = 140 lbs BOD_5/day = 63.5 Kg/day
average = 2.5 lbs/1000 lbs product/day
= 2.5 x 28 = 70 lbs BOD_5/day = 31.75 Kg/day

TSS: max = 21.8 lbs/1000 lbs production/day = (BPT)
= 21.8 x 28 = 610 lbs/day = 276.87 Kg/day
ave = 10.9 lbs/1000 lbs production/day
= 10.9 x 28 = 305.2 lbs/day = 138.4 Kg/day

COD: max = 60 lbs/1000 lbs production/day + 40 lbs/1000 lbs production/day (BAT)
= 100 x 28 = 2800 lbs/day = 1270.06 Kg/day
ave = 30 lbs/1000 lbs production/day + 20 lbs/1000 lbs production/day
= 50 x 28 = 1400 lbs/day = 635.03 Kg/day

40CFR410.53

Sulfide: max = 0.20 lbs/1000 lbs production/day (BAT)
= 0.20 x 28 = 5.6 lbs/day = 2.54 Kg/day
ave = 0.10 lbs/1000 lbs production/day
= 0.10 x 28 = 2.8 lbs/day = 1.27 Kg/day

Phenols: max = 0.10 lbs/1000 lbs production/day (BAT)
= 0.10 x 28 = 2.8 lbs/day = 1.27 Kg/day
ave = 0.05 lbs/1000 lbs production/day
= 0.05 x 28 = 1.4 lbs/day = 0.635 Kg/day

Total Chromium: max = 0.10 lbs/1000 lbs production/day (BAT)
= 0.10 x 28 = 2.8 lbs/day = 1.27 Kg/day
ave = 0.05 lbs/1000 lbs production/day
= 0.05 x 28 = 1.4 lbs/day = 0.635 Kg/day

pH min 6.0 su max 9.0 su

Antidegradation Wasteload Allocations

0.25 (WQS - Existing Conc) + Existing Conc = baseline conc.

Cu:

acute - $0.25(3.6 - 0.84) + 0.84 = 1.53\ \mu g/l$ (baseline = new standard)

$$aWLA_a = \frac{C_a(Q_e + Q_s) - C_s(Q_s)}{Q_e} = \frac{1.53(0.3354 + 5) - 0.29(5)}{0.3354} = 20\ \mu g/l$$

chronic - $0.25(2.7 - 0.74) + 0.74 = 1.23\ \mu g/l$

$$aWLA_c = \frac{1.23(0.3354 + 5.4) - 0.29(5.4)}{0.3354} = 16.4\ \mu g/l$$

Cr III:

acute - $0.25(180 - 1.9) + 1.9 = 46.4\ \mu g/l$

(no background data)

$$aWLA_a = \frac{46.4(0.3354 + 5) - \cancel{0(5)}}{0.3354} = 738\ \mu g/l$$

chronic - $0.25(24 - 1.58) + 1.58 = 7.2\ \mu g/l$

$$aWLA_c = \frac{7.2(0.3354 + 5.4) - \cancel{0(5.4)}}{0.3354} = 123\ \mu g/l$$

Cr VI:

acute - $0.25(16 - 1.57) + 1.57 = 5.2\ \mu g/l$

$$aWLA_a = \frac{5.2(0.3354 + 5) - 0.72(5)}{0.3354} = 72\ \mu g/l$$

chronic - $0.25(11 - 1.42) + 1.42 = 3.8\ \mu g/l$

$$aWLA_c = \frac{3.8(0.3354 + 5.4) - 0.72(5.4)}{0.3354} = 534\ \mu g/l$$

Antidegradation Wasteload Allocations (cont'd)

Zn:

acute baseline = $0.25(36-27.8)+27.8 = 29.8\ \mu g/l$

$$aWLA_a = \frac{29.8(0.3354+5) - 0.97(5)}{0.3354} = 460\ \mu g/l$$

chronic baseline = $0.25(36-23.2)+23.2 = 26.4\ \mu g/l$

$$aWLA_c = \frac{26.4(0.3354+5.4) - 0.97(5.4)}{0.3354} = 436\ \mu g/l$$

APPENDIX D

2012 Impaired Waters Fact Sheets

2012 Impaired Waters

Category 4 & 5 by 2012 Impaired Area ID*

Roanoke and Yadkin River Basins

Cause Group Code: **L50R-01-BAC** - **Smith River and Sycamore Creek**

Location:	Smith River from the mouth of Rich Run on the Smith River downstream to the mouth of Widgeon Creek on the Smith River spanning the Woolwine and Charity Quads. And Sycamore Creek from it's mouth on the Smith River upstream to the Pole Branch confluence.
City/County	Patrick Co.
Use(s):	Recreation
Cause(s) / VA Category:	Escherichia coli / 4A

The Recreation Use is impaired based on 2012 data showing excessive Escherichia coli (E.coli) counts recoded at 4ASRE075.69. The Dan River Bacteria TMDL Study received U.S. EPA approval on 12/08/2008 [Fed ID 35748]; and SWCB approval on 4/28/2009.

4ASRE075.69 (Rt. 708 Bridge) Escherichia coli (E.coli) exceed the 235 cfu/100 ml criterion in six of 36 samples. Excursions range from 250 to 1200 cfu/100 ml.

4ASYC002.02 (Elamsville Road Bridge) E.coli exceed the 235 WQS instantaneous criterion in two of 12 samples. The exceeding values are 380 and 1000 cfy/100 ml.

Assessment Unit	Water name	Location Description	Cause Category	Cause Name	Cycle First Listed	TMDL Schedule	Size
VAW-L50R_SRE01A00	Smith River	Smith River mainstem from the Liberty Fabrics outfall downstream to Widgeon Creek at the watershed boundary.	4A	Escherichia coli	2012	2024	5.61
VAW-L50R_SRE02A00	Smith River	Smith River mainstem from the Jacks Creek mouth downstream to Liberty Fabrics outfall.	4A	Escherichia coli	2012	2024	0.25
VAW-L50R_SRE03A00	Smith River	Smith River mainstem WQS Class VI end of section, as described in WQS, downstream to mouth of Jacks Creek.	4A	Escherichia coli	2012	2024	0.59
VAW-L50R_SRE04A00	Smith River	Smith River mainstem from the Rich Run mouth downstream to WQS Natural Trout section, as described in WQS.	4A	Escherichia coli	2012	2024	2.73
VAW-L50R_SYC01A12	Sycamore Creek	Sycamore Creek from it's mouth on the Smith River upstream to the Pole Branch confluence.	4A	Escherichia coli	2012	2024	5.77

Smith River and Sycamore Creek		**Estuary (sq. miles)**	**Reservoir (acres)**	**River (miles)**
Impaired area ID: VAW-L50R-01	Escherichia coli / 4A Total impaired size by water type:			14.95
Recreation				

Sources:

- Livestock (Grazing or Feeding Operations)

- On-site Treatment Systems (Septic Systems and Similar Decentralized Systems)
- Unspecified Domestic Waste
- Wet Weather Discharges (Non-Point Source)
- Wildlife Other than Waterfowl

* Narrative descriptions, location and city/county describe the entire extent of the impairment. Sizes may not represent the total size of the impairment.

2012 Impaired Waters

Category 4 & 5 by 2012 Impaired Area ID*

Roanoke and Yadkin River Basins

Cause Group Code: **L50R-01-TEMP** - **Smith River**

Location:	The temperature impaired waters begin at the mouth of Rich Run on the Smith River and extend downstream to the mouth of Widgeon Creek on the Smith River spanning the Woolwine and Charity Quads.
City/County	Patrick Co.
Use(s):	Aquatic Life
Cause(s) / VA Category:	Temperature, water / 5C

Exceedance of the WQS Class VI 20°C temperature criterion for this natural trout water caused the original 2002 303(d) Listing of these waters. The 9.18 mile Aquatic Life Use impairment remains.

4ASRE075.69- (Rt. 708 Bridge) Temperature exceeds the 20°C natural trout criterion in ten of 35 measurements within the 2012 data window. The range of exceedance is from 20.5 to 25.2°C all occurring in the summer months. 2010 data find nine of 37 temperature measurements exceeding the 20°C criterion in the summer months. Excursions range from 20.4° to 22.7°C. Temperature exceeds the 20°C natural trout criterion in 12 of 41 measurements with the 2008 assessment. The range of exceedance is from 20.4 to 24.3°C all occurring in the summer months. 2006 records nine of 33 measurements exceeding the criterion and ranging from 21 to 24°C. Excursions are found primarily during the 1999-2002 drought. The temperature impairment, originally listed in 2002, is based on 4ASRE075.69 data where three of 20 measurements exceed the criterion.

Supplemental information: (Outside 2008 Assessment data window 2000 - 2004): Two of eight exceedances of the 20°C criterion are recorded by the US Geological Survey (USGS) station 02071510. The excursions are from July 18 (23°C) and August 15 (24°C) 1995. The USGS station is located 1.19 miles upstream of any known potential anthropogenic source of heat at the Rt. 615 crossing.

Assessment Unit	Water name	Location Description	Cause Category	Cause Name	Cycle First Listed	TMDL Schedule	Size
VAW-L50R_SRE01A00	Smith River	Smith River mainstem from the Liberty Fabrics outfall downstream to Widgeon Creek at the watershed boundary.	5C	Temperature, water	2002	2014	5.61
VAW-L50R_SRE02A00	Smith River	Smith River mainstem from the Jacks Creek mouth downstream to Liberty Fabrics outfall.	5C	Temperature, water	2002	2014	0.25
VAW-L50R_SRE03A00	Smith River	Smith River mainstem WQS Class VI end of section, as described in WQS, downstream to mouth of Jacks Creek.	5C	Temperature, water	2002	2014	0.59
VAW-L50R_SRE04A00	Smith River	Smith River mainstem from the Rich Run mouth downstream to WQS Natural Trout section, as described in WQS.	5C	Temperature, water	2002	2014	2.73

Smith River		**Estuary (sq. miles)**	**Reservoir (acres)**	**River (miles)**
Impaired area ID: VAW-L50R-01	Temperature, water / 5C Total impaired size by water type:			9.18
Aquatic Life				

Sources:

- Source Unknown

* Narrative descriptions, location and city/county describe the entire extent of the impairment. Sizes may not represent the total size of the impairment.