



Sheepsct Valley Conservation Association Water Quality Monitoring Program 2009 Season

By David Miller, WQM Technical Advisor

EXECUTIVE SUMMARY

This report is a summary of the 16th sampling season of the Sheepsct Valley Conservation Association's Water Quality Monitoring Program. In previous years, SVCA had monitored up to 30 sites along the watershed. This year, SVCA decided to focus on 9 sites that deserved continued attention based on trend data. The sites sampled were:

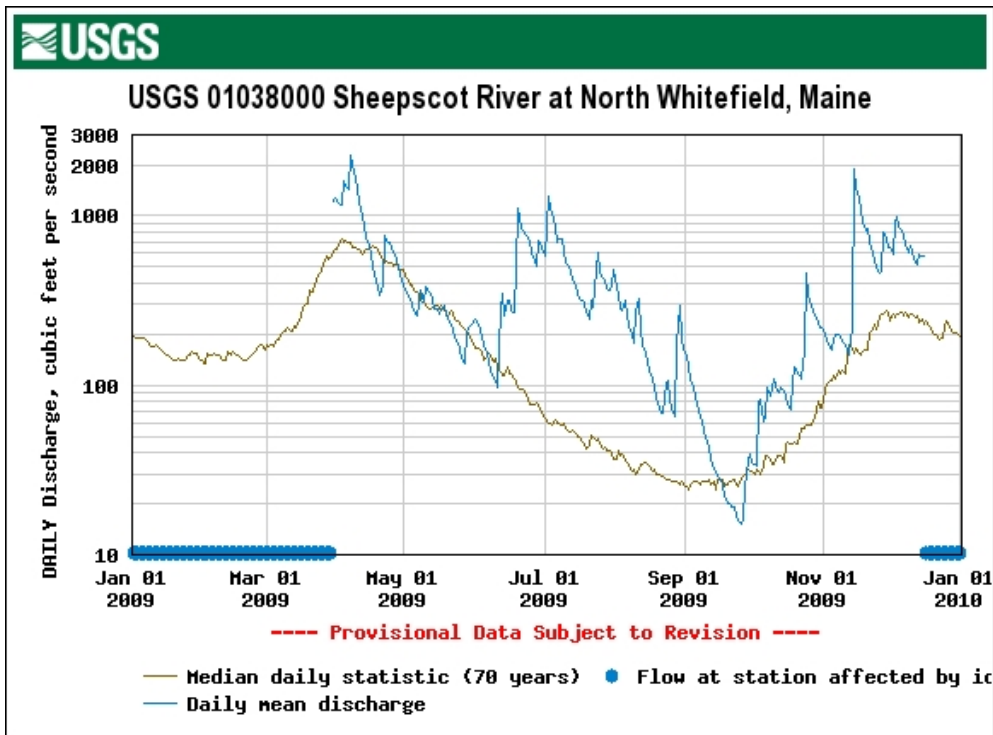
- DY001-E** (Dyer River, Sheepsct)
- S007-E** (Sheepsct River, Head Tide)
- CHABK001-F** (Chamberlain Brook, Kings Mills)
- S013-F** (Sheepsct River, Whitefield)
- CHBK001-F** (Choate Brook, Windsor)
- MEBK001-F** (Meadow Brook, China)
- WB001-F** (West Branch, Whitefield)
- WB002-F** (West Branch, Windsor)
- WB005-F** (West Branch, China)

Water samples were tested for bacteria and dissolved oxygen. Water temperature at all sites and salinity at one estuarine site were measured. Initially we were to have been a part of the new DEP volunteer monitoring program for rivers/streams. DEP supplied reporting forms, thermometers and conductivity pens. As it turned out the program was delayed and put on hold for this year, but we were able to collect conductivity data. DEP continued the turbidity study in 2009 by sampling 22 sites in the Sheepsct watershed during a June 19-20 storm event. The data continues to be used by the MDEP for water quality assessment as well as for their Salmon River and Stream Team Programs.

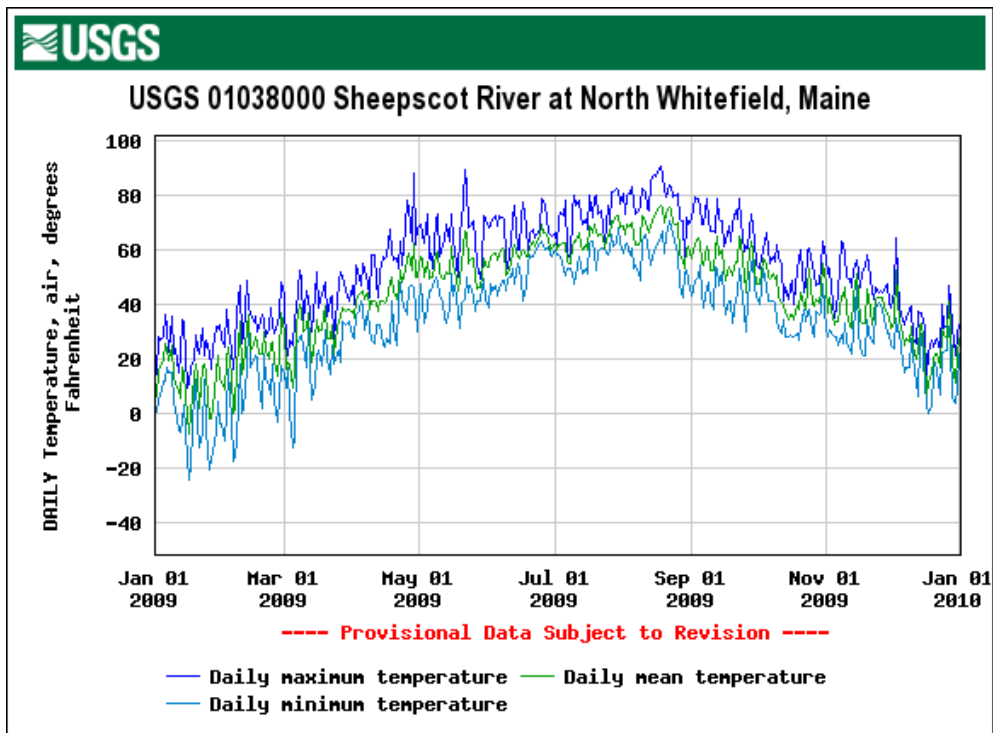
Weather

The year 2009 was much wetter and slightly warmer than normal. According to the National Weather Service's Portland reporting station, 2009 was one of the wettest years in its 139 years of record. Precipitation for the year at Portland was nearly 13 inches above normal. The summer of 2009 was the wettest summer on record. All three summer months had above average rainfall. The year actually started out drier than normal with the first three months at below normal precipitation. Temperatures for the year were only slightly warmer than average. A very warm spring was followed by a June and July with well below normal temperatures.

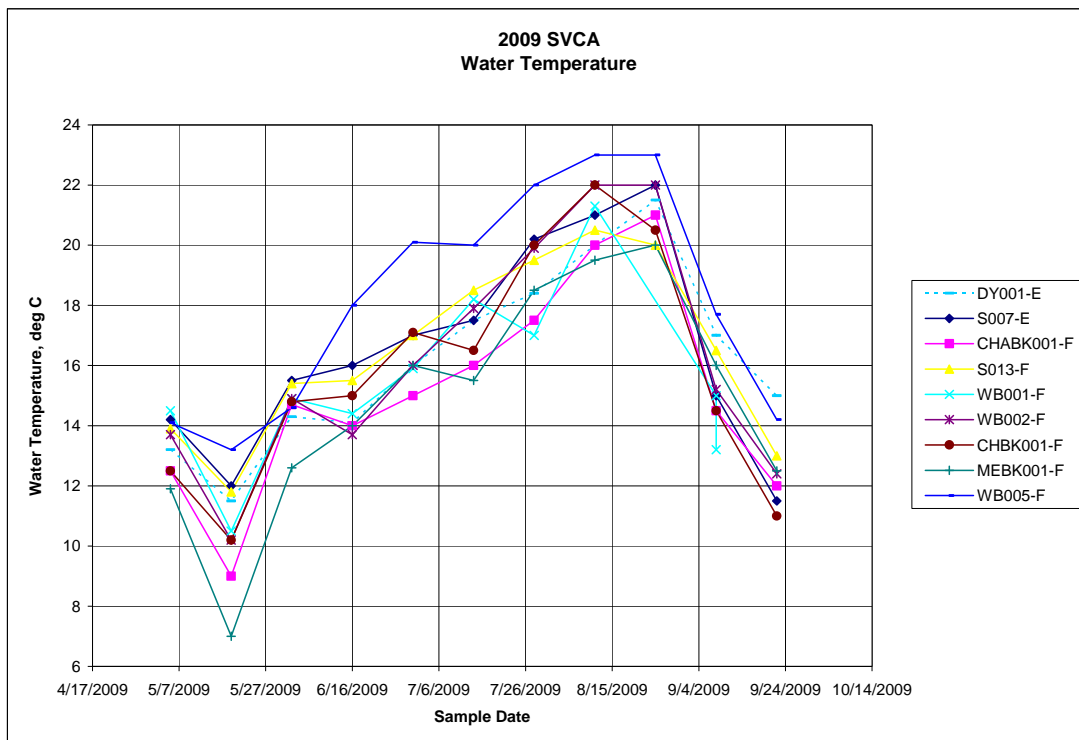
This weather is reflected in the data at the USGS gage station on the Sheepsct River at Whitefield (see Graphs 1-2). River flows stayed above the 70 year mean for most of the year. The water temperatures recorded at the SVCA sampling sites are shown in Graph #3. Peak temperatures were reached during mid to late August and subsequently rapidly fell.



Graph #1: Mean 2009 discharge at the Whitefield Gage station near site S013 and FB001



Graph #2: Recorded 2009 daily air temperature (in degrees Fahrenheit) at Whitefield gage station near sites S013 and FB001

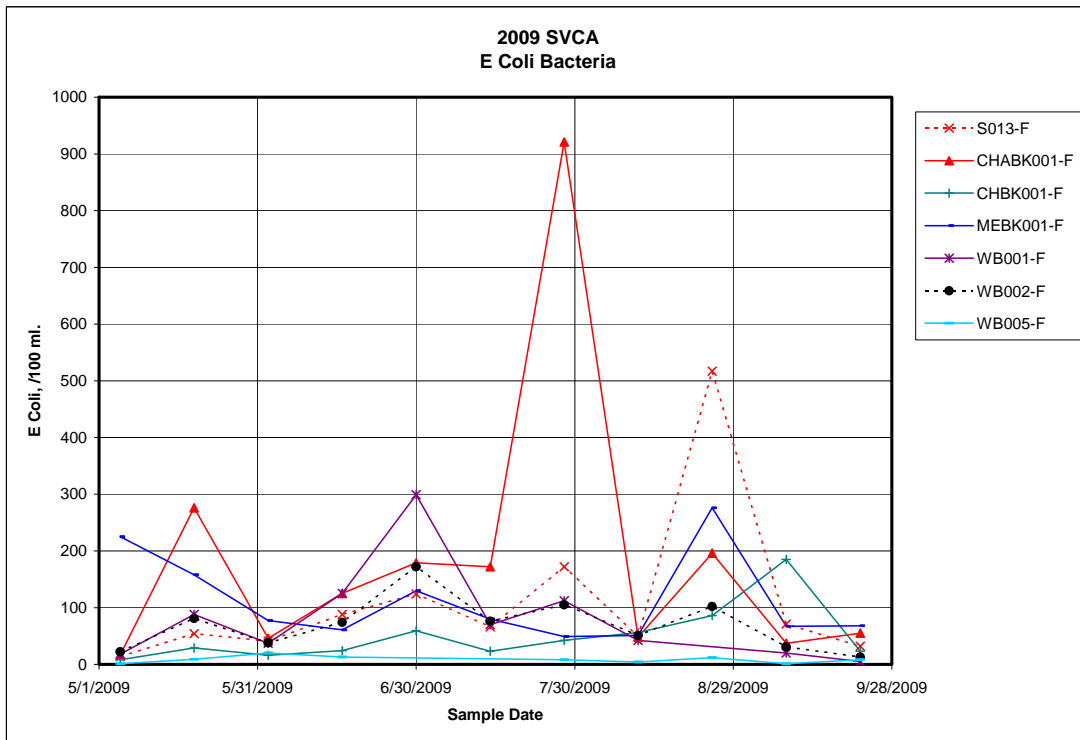


Graph #3: 2009 Summer Water temperature (in degrees Celsius) at SVCA Sample Sites

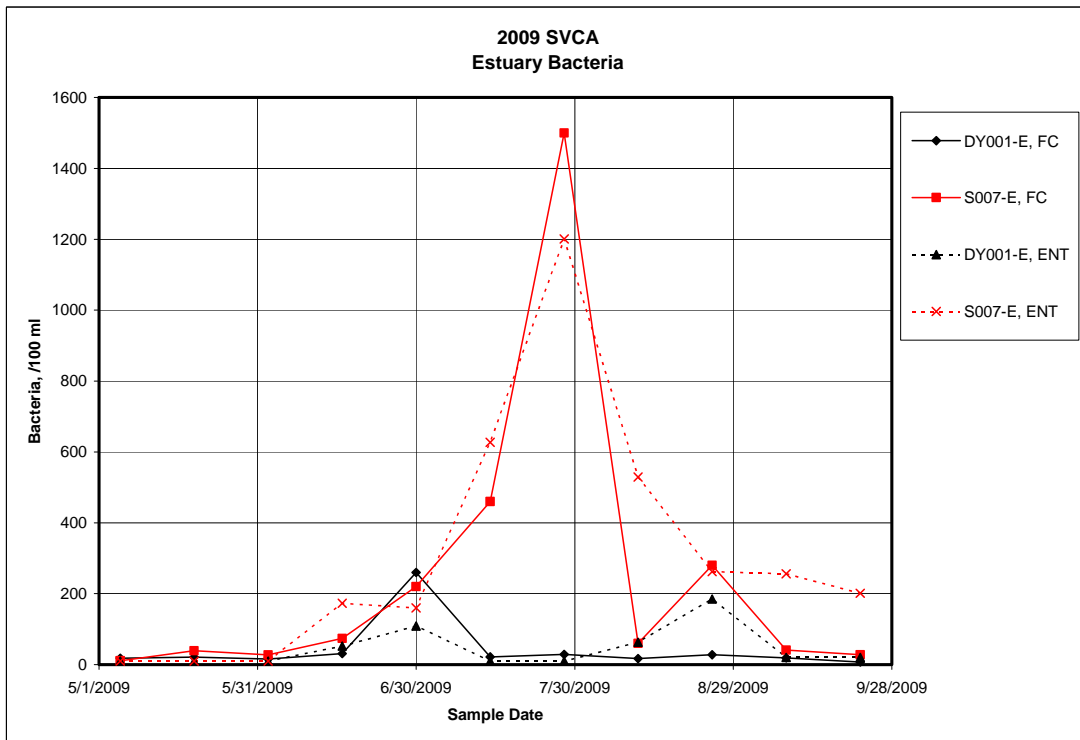
Water Quality Overview

Bacteria

The SVCA bacteria data are presented in the following two graphs. *E. coli* was sampled at freshwater sites while *Enterococcus* and *Fecal Coliform* were sampled at estuary sites. Two large spikes for *E. Coli* were measured at CHABK001-F on 7/28/09 (there was a 2 inch rain event on 7/24) and S013-F on 8/25/09 (there was a 3 inch rain event on 8/23). S007-E recorded spikes of both *Fecal Coliform* and *Enterococcus* on 7/28/09. Non-attainment events for bacteria standards for each site are summarized in the 1994-2009 summary tables at the end of this report. Only one site, WB005-F, met bacteria standards throughout the sampling period.



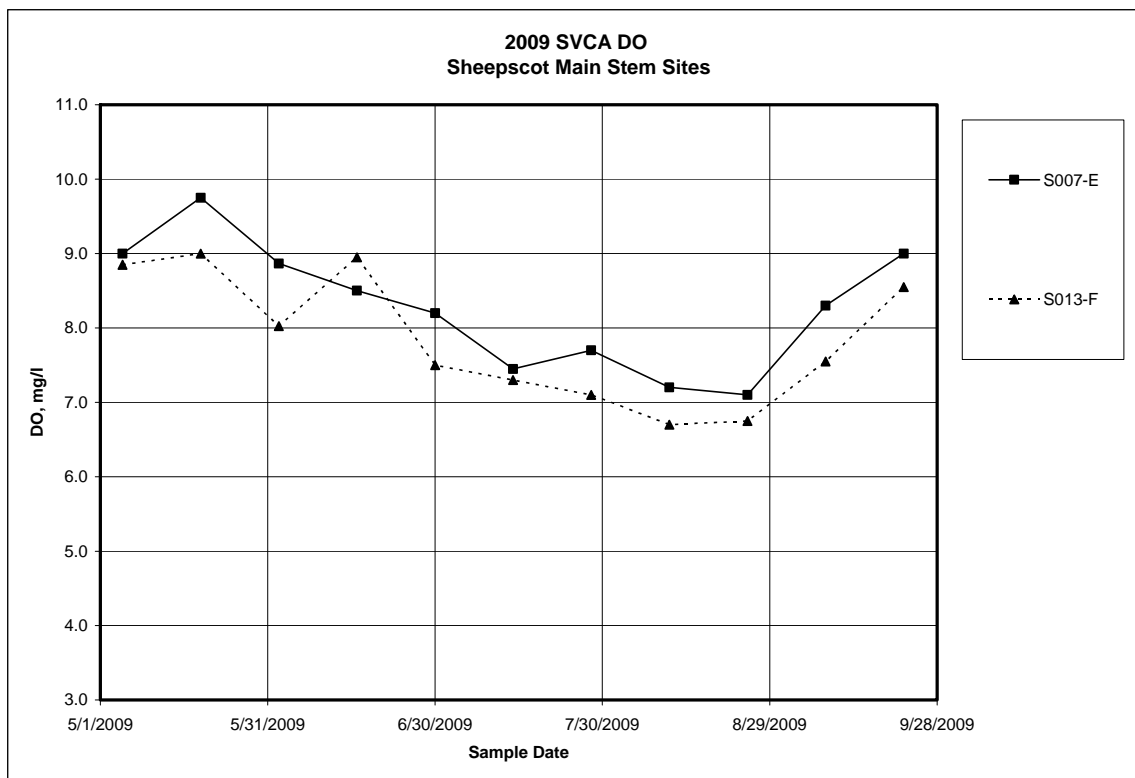
Graph #4: 2009 E Coli Bacteria



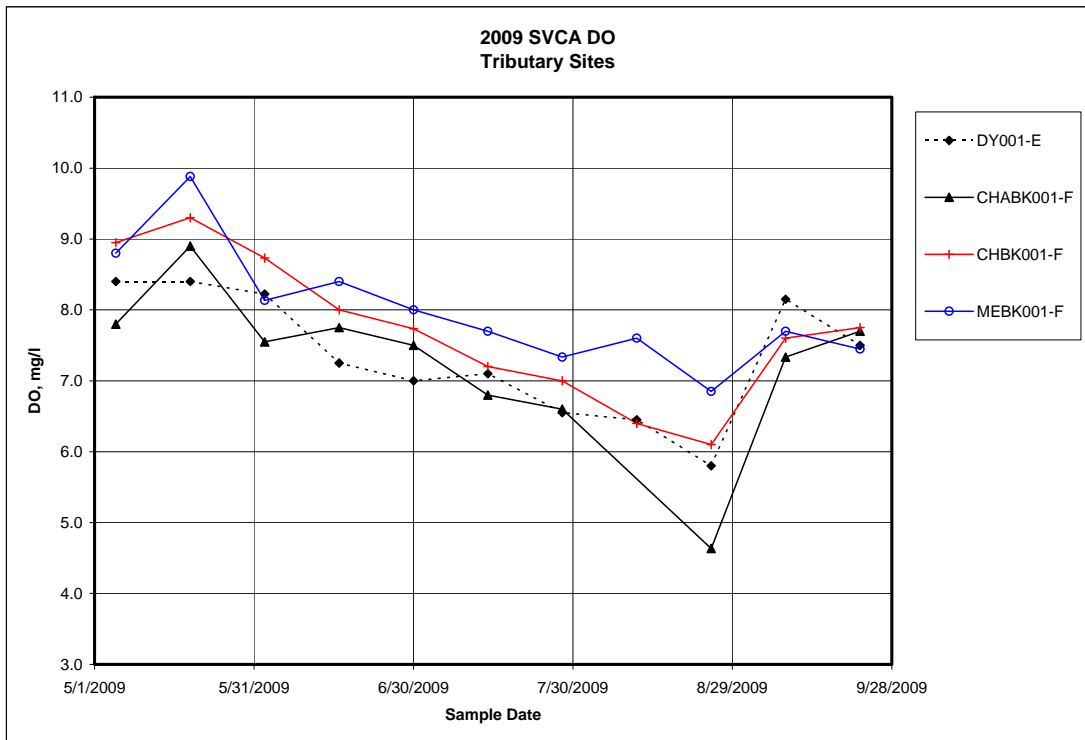
Graph #5: 2009 Estuary Bacteria

Dissolved Oxygen

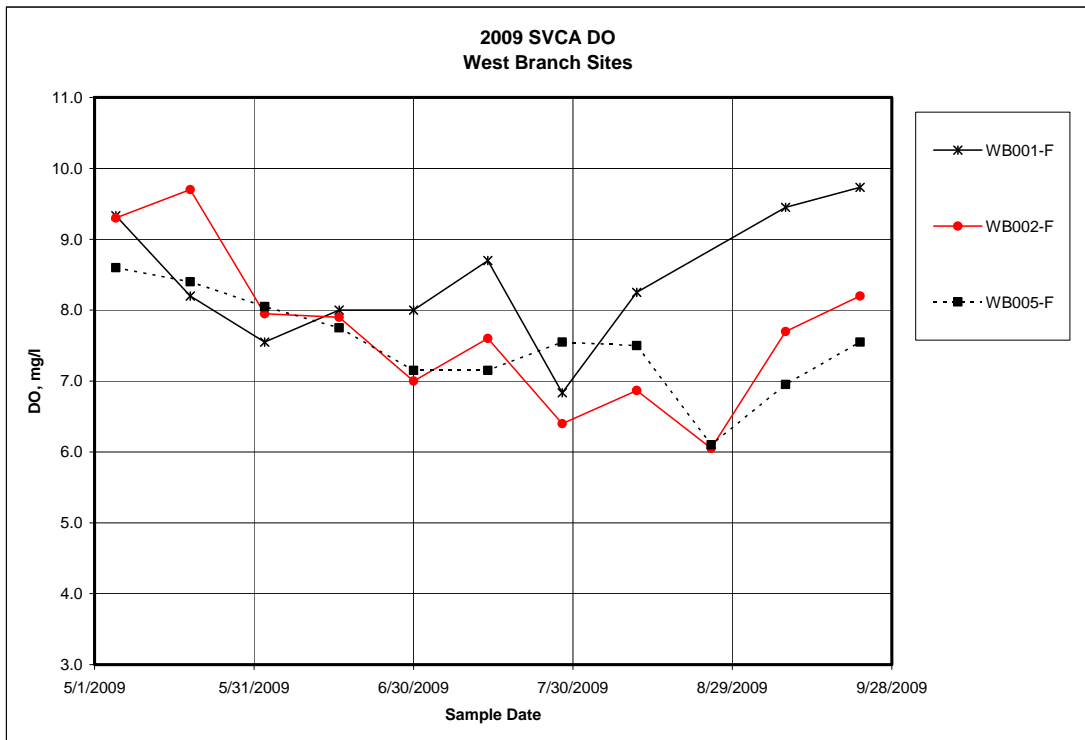
The SVCA dissolved oxygen (DO) data are presented in the following three graphs and two tables. The 2009 SVCA data showed values above 7 mg/l (the class A and B standard) until mid July and after early September. The tables present the percent DO saturation values for the estuarine sites. These two sites are class SB which has a DO standard of a minimum of 85% saturation. In general, given the high river flows throughout the summer it would be expected that DO values would be elevated. Descriptions of the DO standards and a table of non-attainment are given in the 1994-2009 summary at the end of this report.



Graph #6: 2009 Main Stem DO



Graph #7: 2009 Tributary DO



Graph #8: 2009 West Branch DO

DY001-E

Sample Date	Temp C	Salinity ppt	ave. DO ppm	DO Sat %
5/5/2009	13.2	0	8.4	80%
5/19/2009	11.5	15.1	8.4	85%
6/2/2009	14.3	14.5	8.2	88%
6/16/2009	14.1	15.7	7.3	78%
6/30/2009	16.0	10.5	7.0	76%
7/14/2009	17.5	10.6	7.1	79%
7/28/2009	18.4	6.5	6.55	73%
8/11/2009	20.0	15.2	6.45	78%
8/25/2009	21.5	14.3	5.8	71%
9/8/2009	17.0	6.7	8.15	88%
9/22/2009	15.0	18.5	7.5	83%

S007-E

Sample Date	Temp C	Salinity ppt	DO ppm	DO Sat %
5/5/2009	14.2	0	9.0	88%
5/19/2009	12	0	9.8	90%
6/2/2009	15.5	0	8.9	89%
6/16/2009	16	0	8.5	86%
6/30/2009	17.0	0	8.2	85%
7/14/2009	17.5	0	7.45	78%
7/28/2009	20.2	0	7.7	85%
8/11/2009	21.0	0	7.2	81%
8/25/2009	22.0	0	7.1	81%
9/8/2009	15.0	0	8.3	82%
9/22/2009	11.5	0	9.0	83%

Specific Conductance

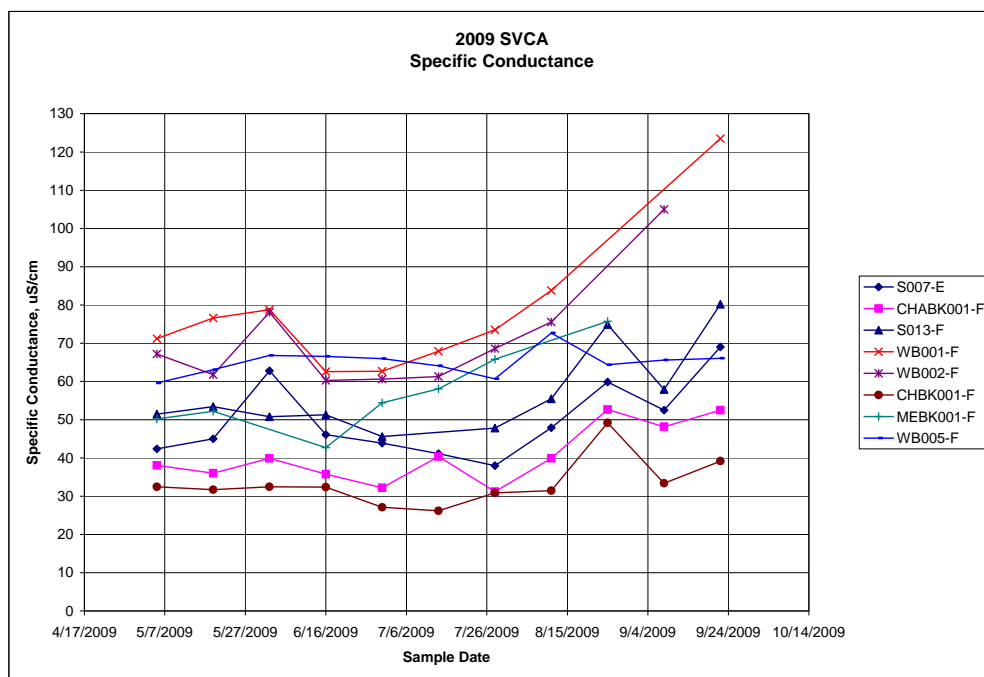
Conductivity is a measure of the ability of water to pass an electrical current. Therefore, conductivity is an indirect measure of the presence of dissolved solids such as chloride, nitrate, sulfate, phosphate, sodium, magnesium, calcium, and iron, and can be used as an indicator of water pollution. Conductivity is also affected by temperature: the warmer the water, the higher the conductivity. For this reason, conductivity is reported as conductivity at 25 degrees Celsius (25 C), or specific conductance (SC).

Specific Conductance in streams and rivers is affected primarily by the geology of the area through which the water flows. Ground water inflows can have the same effects depending on the bedrock they flow through. Discharges to streams can change the specific conductance depending on their make-up.

Specific Conductance is measured in micro siemens per centimeter ($\mu\text{S}/\text{cm}$). Generally, there aren't regulatory levels for SC. Instead, the concentration of total dissolved solids (TDS) is often regulated. However, SC is an easily-obtained parameter that is a good indicator of the amount of dissolved solids in a water and thus can be used to detect contaminants in water.

Pure water would theoretically have an SC value of zero $\mu\text{S}/\text{cm}$ at 25°C . Distilled or deionized water has an SC of at least $1\ \mu\text{S}/\text{cm}$. Rain water can have an SC value higher than distilled water, because it dissolves gases from the air and also particles of dust or other airborne material. Sea water has an SC of approximately $50,000\ \mu\text{S}/\text{cm}$, because of the large amount of dissolved salts it contains. The specific conductance of rivers in the United States generally ranges from 50 to $1500\ \mu\text{S}/\text{cm}$. Studies of inland fresh waters indicate that streams supporting good mixed fisheries have a range between 150 and $500\ \mu\text{S}/\text{cm}$. Industrial waters can range as high as $10,000\ \mu\text{S}/\text{cm}$.

The following graph presents the SC measurements at the SVCA 2009 sites. The results were generally consistent throughout the summer with values between 30 and $85\ \mu\text{S}/\text{cm}$ (there were two isolated readings of 105 and 123 at WB002 and WB001).



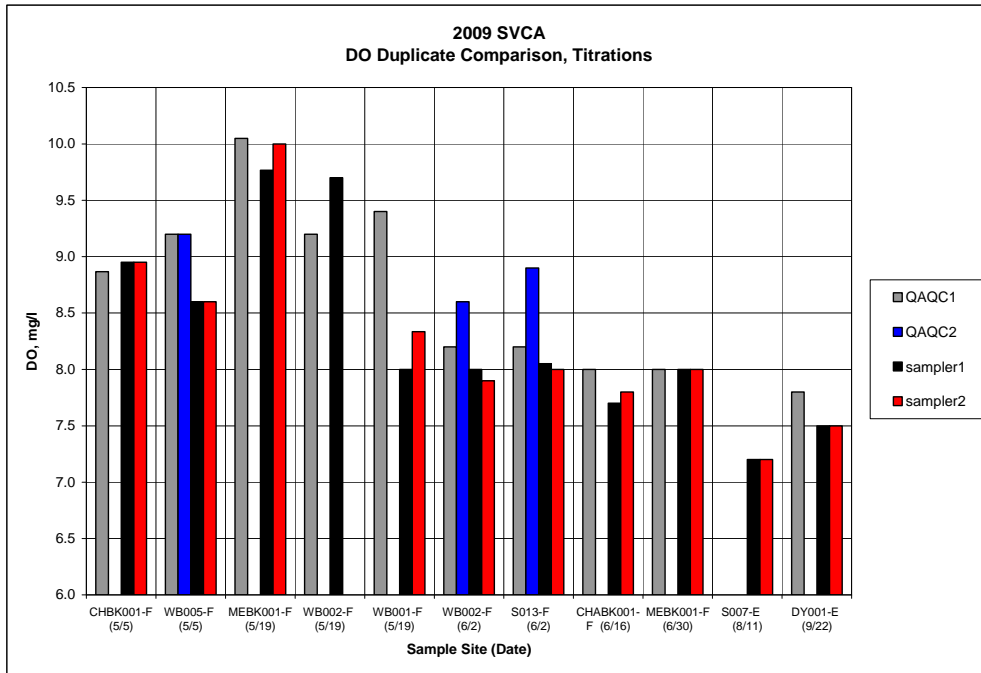
Graph #9: 2009 Specific Conductance

QAQC/Duplicates

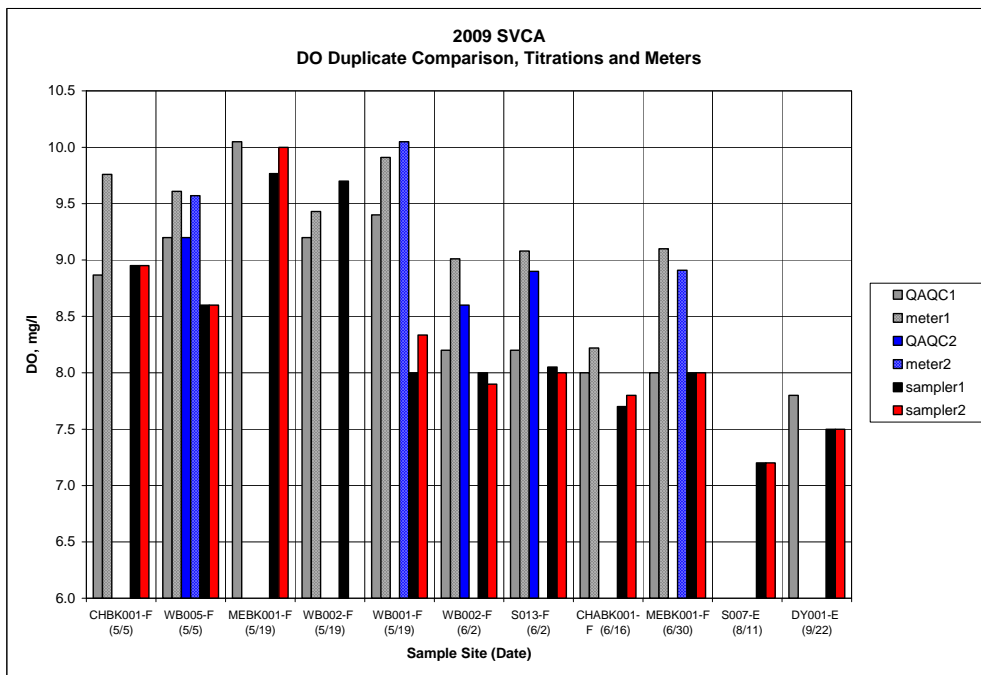
As a part of its monitoring program, SVCA includes at least one duplicate sampling per site during a sampling season. The following graphs show the comparison of duplicate sampling for dissolved oxygen and bacteria.

Graph 10 shows a comparison of DO reading duplicates using the titration method. The red value is the duplicate performed by the regular sampler and the gray and blue values are those performed by the QAQC team. In most cases the values are within the target range of $0.5\ \text{mg}/\text{l}$. In three cases only one value of multiple values was outside the range.

Graph 10a shows the same comparison of DO duplicates but also including meter readings. In general the meters readings were higher than the titration values, often outside the $0.5\ \text{mg}/\text{l}$ target. (The 3 meters used are aging and there were some functional problems with 2 of the 3 meters during the season)

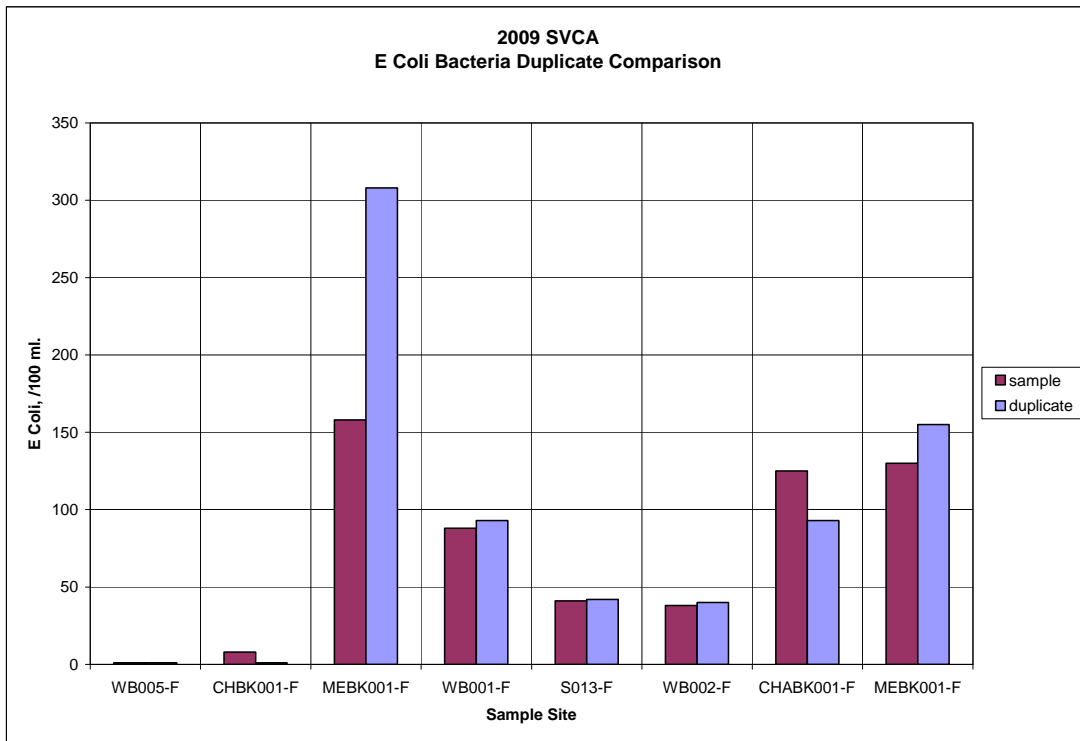


Graph #10: 2009 DO Duplicate Comparisons, Titrations

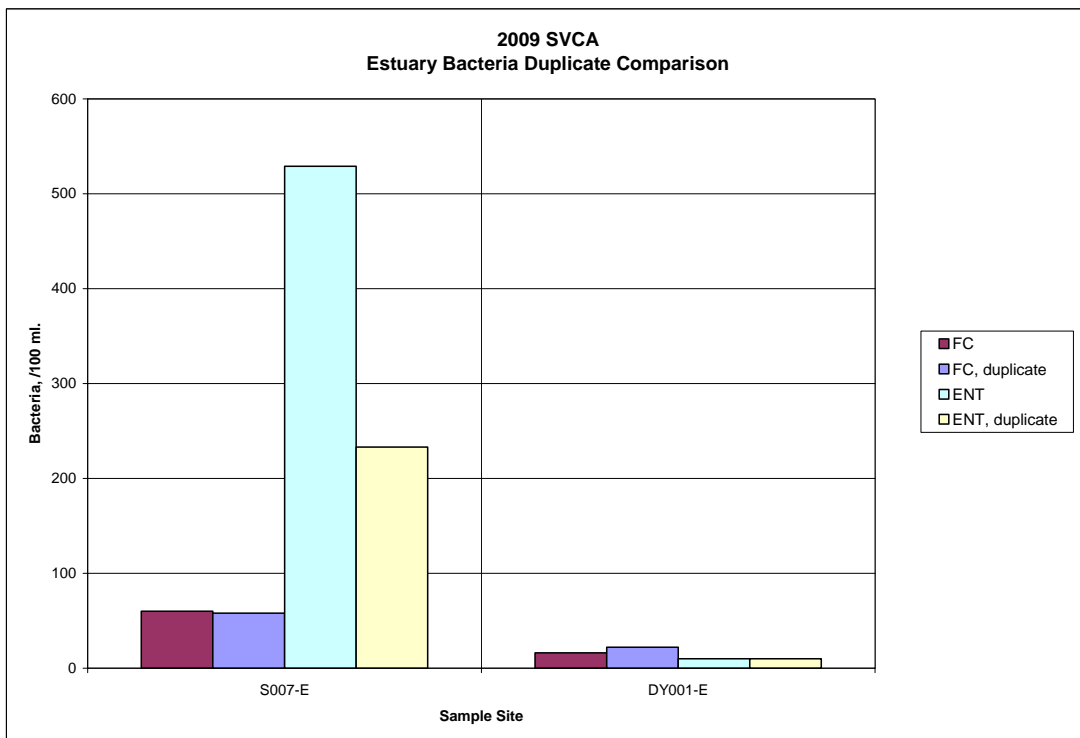


Graph #10a: 2009 DO Duplicate Comparisons, Titrations and Meters

Graphs 11 and 12 show comparisons of the bacteria duplicates. With two exceptions (MEBK001-F and S007-E, enterococcus) the results show good agreement of bacteria results.



Graph #11: 2009 E Coli Duplicate Comparisons



Graph #12: 2009 Estuary Bacteria Duplicate Comparisons

Turbidity Study

DEP continued the turbidity study in the Sheepscot watershed and Mark Whiting reported the results in the following table.

Location			Date	Time	Type	Turbidity, NTU	UTMs East	UTMs North
Sheepscot	Alna Dam	S008.5-F	6/19/2009	16:35	stormwater	69	450026	4884864
Sheepscot	Carlton Brook	CHABK001-F	6/19/2009	14:00	stormwater	5.6	450151	4891676
Sheepscot	N of WB confluence		6/20/2009	11:45	stormwater	3.5	454388	4898961
Sheepscot	Finn Brook	FBBK001-F	6/19/2009	11:15	stormwater	10		
Sheepscot	Finn Brook	FBBK001-F	6/20/2009	10:25	stormwater	10		
Sheepscot	Finn Brook	FBBK001-F	6/22/2009	13:45	stormwater	6.5		
West Branch	Howe Rd	WB001-F	6/20/2009	11:00	stormwater	19		
West Branch	Howe Rd	WB001-F	6/22/2009	18:15	stormwater	9.3		
	un-named stream at Townhouse Rd		6/19/2009	12:30	stormwater	85	449705	4893697
Sheepscot	Rt 126 gauge		6/20/2009	10:40	stormwater	15		
Sheepscot	Coopers Mills Dam		6/22/2009	13:30	stormwater	1.8		
Sheepscot	Rt 126 gauge		6/19/2009	11:30	stormwater	3		
Sheepscot	un-named stream N Whitefield		6/19/2009	11:50	stormwater	140	452045	4896119
Sheepscot	un-named stream N Whitefield, cows		6/19/2009	12:15	stormwater	180	450861	4895488
	Philbrick Brook		6/19/2009	13:15	stormwater	21	449459	4892852
	Philbrick Brook, upstream 200 ft		6/20/2009	9:50	stormwater	8.8	449393	4892796
Sheepscot	Rt 126 gauge	S013-F	6/22/2009	14:00	stormwater	6.5		
Sheepscot	un-named stream Alna		6/19/2009	16:20	stormwater	50	449836	4885046
Sheepscot	un-named stream Whitefield		6/19/2009	16:05	stormwater	610	449713	4886280
Sheepscot	Weaver Brook	WEBK001-F	6/19/2009	15:10	stormwater	350	450665	4888642
Sheepscot	Weaver Brook	WEBK001-F	6/20/2009	9:10	stormwater	19		
Sheepscot	Weaver Brook 50' upstream		6/19/2009	7:53	stormwater	1.8	450653	4888646

Notes: samples by Charlie Baeder, many taken by canoe on mainstem, huge storms on 6/19 and 6/20

Conclusion

Despite a high flow year all sites reported at least one day of non-attainment of DO standards. Only one site (WB005-F) showed attainment of bacteria standards throughout the season. The DO meters should be sent out for maintenance and still should be used in QAQC, but the titrations should be the primary QAQC method. It is planned to continue with the nine 2009 sites for the 2010 season.

We plan to continue to work closely with the new Volunteer River Monitoring Program, run by the MDEP, to come up with a new program that will fulfill the needs of both parties. We are also continuing to cooperate with DEP's Salmon River Program and plan to continue turbidity monitoring as a part of our program for better understanding of where protection needs to occur to prevent anthropogenic sources of sediment load.

We will also be conducting a parallel study during the season on the Dyer River, working with the Watershed Council who will be designing testing parameters and protocols for various sites along the Dyer.

The web site for MDEP Bureau of Land and Water Quality also has many interesting links, including documents using our data. You can find them at: <http://www.maine.gov/dep/blwq>

Thank you

To all of the dedicated volunteers who have made the past 16 years of sampling possible. We thank Kristin Pennock for office help and Mark Whiting for assistance with turbidity sampling. Thank you to Lili Pugh for her work in writing past yearly summaries and for developing the historical data tables.

Water Quality Monitoring Committee

Dede Heath, Co-coordinator
Karin Swanson, Co-coordinator
Alex Pugh, Technical Advisor
Lili Pugh, Technical Advisor
David Miller, Technical Advisor/Data Coordinator
Maureen Hoffman, Executive Director

QAQC Team

Dede Heath
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Denise Blanchette	Jim Crowley
Rick Kaselis	Susanne Meidel
Paul Mitnik	David Miller
Sharon Miller	Alex Pugh
Gabby Rigaud	

Couriers

Lee Murch
Alex & Lili Pugh

Back up monitors

Maureen Hoffman	Dede Heath
Karin Swanson	Lili Pugh

Appendix

Sheepscot River Water Quality Data 1994-2009

The following data has been summarized but not yet thoroughly analyzed. It should be considered as preliminary results until further analysis has been completed. Only the sites sampled in 2009 are shown. The number of sampling dates for a particular year for each site is listed in parentheses.

All **violations** of State of Maine Water Quality Standards for the Sheepscot Drainage in the data collected are in **BOLD**. *Violations are based on standards (or surrogates) in effect during the specific sample year and may not reflect current standards (see water quality classifications of the Sheepscot below).*

The Sheepscot Main Stem from Route 17 to tidewater and the West Branch are Class AA:

There are no specified numerical standards for AA waters. Class AA is the highest classification and sections of river that have this designation are "...outstanding natural resources and which should be preserved because of their ecological, social, scenic or recreational importance." For comparison purposes the following standards had been created (Note: with change in B standards, AA surrogate standards had been changed for 2007-2008). Maine's Statewide Bacteria TMDL was approved in 2009. The TMDL specifies the use of GPA standards for 'as naturally occurs' (table 4.1, pg 25 <http://www.maine.gov/dep/blwq/docmonitoring/TMDL/2009/report.pdf>).

Dissolved Oxygen:	7.0 mg/l or 75% saturation (class A standard)	
E Coli (1994-2006):	64 geometric mean	214 instantaneous
E Coli (2007-08, B standard):	64 geometric mean	236 instantaneous
E Coli (2007-08, 1/2 B standard):	32 geometric mean	118 instantaneous
E Coli (2009, GPA)	29 geometric mean	194 instantaneous

The Mainstem of the Sheepscot River from its headwaters to Sheepscot Lake and the tributaries Trout Brook, Choate Brook, Weaver Brook, Ben Brook, Finn Brook, Hewitt Brook, Dearborn Brook, and Culvert Pond Brook were upgraded in 2003 to Class A:

There are no specified numerical bacterial standards for A waters. Bacterial levels are to be as naturally occurs. For comparison purposes standards for these waters are the same as those used for Class AA waters above.

The Mainstem of the Sheepscot River from Sheepscot Lake to the Route 17 bridge in Whitefield and all tributaries not otherwise designated are Class B. The standards for Class B changed in 2005 (implemented in 2006). The standards are as follows:

Dissolved Oxygen:	7.0 mg/l or 75% O ₂ Sat., whichever is higher.	
E Coli (1994-2005):	64 geometric mean	427 instantaneous
E Coli (2006-2009):	64 geometric mean	236 instantaneous

Estuarine waters of the Sheepscot are Class SB. The standards for SB waters are as follows:

Dissolved Oxygen (1994-2008)	7.0 mg/l or 85% O ₂ Sat., whichever is higher*
Enterococci:	8 geometric mean 54 instantaneous
Dissolved Oxygen 2009	85% O ₂ Sat.
Fecal coliform** 2009	14 geometric mean 31 90 th percentile

*standard was/is actually 85% saturation, 7.0 mg/l was used for comparative purposes

**for approved shellfish harvesting waters

Estuary and Tributaries

DY001-E

Dyer River. At mouth, below bridge in Sheepscot Village. Class SB

<i>YEAR</i>	<i>FECAL COLIFORM GEO MEAN</i>	<i>ENTEROCOCCI GEO MEAN</i>	<i>ENTEROCOCCI DAYS IN VIOLATION</i>	<i>D.O. DAYS IN VIOLATION</i>	<i>AVERAGE WATER TEMP (°C)</i>
1994				9 (9)	
1995	18.4			4 (8)	
1996	48.3	36.0	4 (11)	8 (11)	
1997	9.9	3.5	0 (10)	5 (12)	
1998	22.3	20.6	4 (11)	4 (11)	
1999	20.6	19.2	2 (12)	4 (12)	
2000	42.0	115.5	8 (10)	0 (10)	
2001	14.9	27.4	3 (11)	3 (12)	
2002	19.0	25.4	4 (11)	1 (11)	16.1
2003	34.2	32.6	5 (11)	6 (11)	16.7
2004	56.6	22.7	2 (11)	3 (11)	17.6
2005	20.5	42.6	2 (12)	3 (12)	14.2
2006	96.0	118.1	8 (12)	6 (11)	18.3
2007	11.6	12.3	2 (11)	2 (10)	16.7
2008	54.6	28.8	3 (10)	3 (11)	17.8
2009	24.6	25.2	3 (11)	8 (11)*	16.2

*85% standard

S007-E

Sheepscoot River. Downriver from Head Tide Road Bridge; behind SVCA Office; river left. Class SB

<i>YEAR</i>	<i>FECAL COLIFORM GEO MEAN</i>	<i>ENTEROCOCCI GEO MEAN</i>	<i>ENTERO DAYS IN VIOLATION</i>	<i>E Coli Geo mean</i>	<i>D.O. DAYS IN VIOLATION</i>	<i>AVERAGE WATER TEMP (°C)</i>
1994	80.1				1 (10)	
1995	32.3				2 (12)	
1996	21.5	88.7	7 (12)		0 (12)	
1997	26.0	138.8	9 (12)		0 (12)	
1998	58.2	337.1	9 (12)		1 (12)	
1999	111	359	8 (11)	59 (6)	0 (7)	
2000	113.8	564	8 (9)		0 (12)	
2001	406.2	82.5	1 (2)	86.2 (10)	1 (12)	
2002	68.2	241.6	9 (11)	--	0 (12)	13.8
2003	201.4	19.1	1 (11)	--	0 (11)	17.0
2004	75.8	237.9	7 (10)	--	0 (10)	17.1
2005	22.1	45.6	4(12)		0(10)	18.0
2006	44.1	222.4	8 (12)		0 (9)	17.5
2007	35.7	17.0	2 (11)		0 (11)	14.8
2008	71.7	82.8	6 (11)		0 (11)	17.0
2009	88.2	127.8	8 (11)		5 (11)*	16.5

*85% standard

Sheepscoot Main Stem and Tributaries

CHABK001-F

Chamberlain Brook, King's Mills. Below route 194 Bridge. Class B

<i>YEAR</i>	<i>E COLI GEOMEAN</i>	<i>E COLI DAYS IN VIOLATION</i>	<i>D.O. DAYS IN VIOLATION</i>	<i>AVERAGE WATER TEMP (°C)</i>
1997	85.3	2 (8)		
1998	157.5	3 (12)	11 (12)	
1999	165	5 (12)	10 (12)	
2000	113.2	1 (9)	6 (8)	
2001	84.6	1 (12)	11(12)	
2002	49.1	1 (12)	9 (12)	16.5
2003	40.2	1 (9)	6 (9)	17.0
2004	96.6	1(11)	0 (11)	
2005	80.5	0 (12)	6 (10)	15.4
2006	133.3	0 (11)	8 (11)	17.0
2007	70.8	2 (11)	8 (11)	14.8
2008	63.0	3 (11)	4 (11)	16.6
2009	103.5	2 (11)	8 (10)*	15.1

*5(10) non-attainment of 75% standard only

S013-F

Sheepscot River. North Whitefield. Below Route 126. River right. Class AA

<i>YEAR</i>	<i>E COLI GEOMEAN</i>	<i>E COLI DAYS IN VIOLATION (1/2 B STD)</i>	<i>E COLI DAYS IN VIOLATION (B STANDARD)</i>	<i>E COLI DAYS IN VIOLATION (GPA)</i>	<i>D.O. DAYS IN VIOLATION</i>	<i>AVERAGE WATER TEMP (°C)</i>
1994	28.5	0 (9)			3 (9)	
1995	33.5	1 (11)			0 (12)	
1996	49.5	1 (5)				
1997	41.9	1 (10)			2 (8)	
1998	29.5	0 (8)			3 (8)	
1999	85.1	1 (11)			0 (5)	
2000	54.5	1 (12)				
2001	33.0	0 (11)			4 (11)	
2002	44.0	0 (11)			2 (12)	17.8
2003	34.5	0 (11)			2 (11)	18.4
2004	94.0	1 (9)			1 (9)	18.6
2005	55.3	1 (11)			1 (1)	18.1
2006	95.7	2 (12)			2 (11)	18.0
2007	42.9	1 (11)	1 (11)		2 (11)	16.3
2008	55.0	2 (11)	0 (11)		2 (11)	16.8
2009	70.7			1 (11)	2 (11)	16.5

West Branch and Tributaries

WB001-F

West Branch Sheepscoot River. Below Howe Road Bridge, Whitefield. Class AA

<i>YEAR</i>	<i>E COLI GEOMEAN</i>	<i>E COLI DAYS IN VIOLATION (1/2B STD)</i>	<i>E COLI DAYS IN VIOLATION (B STANDARD)</i>	<i>E COLI DAYS IN VIOLATION (GPA)</i>	<i>D.O. DAYS IN VIOLATION</i>	<i>AVERAGE WATER TEMP (°C)</i>
1994	19.9	0 (7)			0 (7)	
1995	17.7	0 (12)			1 (12)	
1996	36.2	0 (12)			4 (12)	
1997	23.0	0 (10)			0 (10)	
1998	50.3	1 (10)			0 (10)	
1999	30.3	1 (12)			0 (12)	
2000	28.9	1 (12)			0 (12)	
2001	16.2	0 (10)			0 (10)	
2002	23.2	0 (12)			0 (12)	15.5
2003	17.6	0 (10)			0 (10)	16.4
2004	43.6	1 (10)			0 (5)	17.6
2005	27.6	1 (11)			0 (10)	18.1
2006	76.6	1 (8)			3 (10)	17.9
2007	43.0	1 (8)	1 (8)		0 (10)	17.3
2008	63.5	2 (9)	1 (9)		1 (10)	16.1
2009	48.5			1 (10)	2 (10)*	15.5

*1(10) non-attainment of 75% standard only

WB002-F

West Branch Sheepscoot River. Above Route 105 Bridge, Whitefield. Class AA

<i>YEAR</i>	<i>E COLI GEOMEAN</i>	<i>E COLI DAYS IN VIOLATION (1/2B STD)</i>	<i>E COLI DAYS IN VIOLATION (B STANDARD)</i>	<i>E COLI DAYS IN VIOLATION (GPA)</i>	<i>D.O. DAYS IN VIOLATION</i>	<i>AVERAGE WATER TEMP (°C)</i>
1994	48.9	0 (8)			8 (10)	
1995	30.8	1 (11)			5 (10)	
1996	40.4	1 (12)			5 (12)	
1997	19.9	0 (12)			No data	
1998	40.3	1 (12)			7 (12)	
1999	49.9	1 (12)			8 (12)	
2000	64.8	0 (12)			4 (12)	
2001	51.7	1 (12)			5 (12)	
2002	33.0	0 (12)			7 (12)	17.2
2003	32.3	0 (12)			7 (11)	18.1
2004	79.3	1 (11)			3 (11)	17.8
2005	42.7	1 (13)			4(11)	20.3
2006	94.6	1 (12)			5 (9)	16.3
2007	36.6	1 (11)	1 (11)		2 (11)	16.7
2008	52.5	2 (11)	0 (11)		6 (11)	17.3
2009	55.2			0 (11)	4 (11)*	16.2

*1(11) non-attainment of 75% standard only

CHBK001-FChoate Brook. Above Sampson Road bridge just north of Route 105, Windsor. Class A (1997-2003)
Class AA (2004)

<i>YEAR</i>	<i>E COLI GEOMEAN</i>	<i>E COLI DAYS IN VIOLATION (1/2B STD)</i>	<i>E COLI DAYS IN VIOLATION (B STANDARD)</i>	<i>E COLI DAYS IN VIOLATION (GPA)</i>	<i>D.O. DAYS IN VIOLATION</i>	<i>AVERAGE WATER TEMP (°C)</i>
1997	42.1		0 (12)		7 (12)	
1998	131.6		0 (11)		2 (4)	
1999	108.9		1 (9)		4 (8)	
2000	63.3		1 (12)		7 (12)	
2001	104.2		1 (12)		11 (12)	
2002	91.0		2 (11)		8 (12)	15.0
2003	192.9		6 (11)		8 (11)	15.9
2004	135.7	1 (11)			7 (11)	16.3
2005	32.2	1 (12)			7 (12)	16.5
2006	103.5	1 (11)			6 (11)	17.1
2007	96.1	4 (11)	3 (11)		4 (11)	14.8
2008	73.0	3 (11)	3 (11)		5 (11)	15.6
2009	35.2			0 (11)	4 (11)*	15.8

*2(11) non-attainment of 75% standard only

MEBK001-F

Meadow Brook, below old railroad grade on Oliver Dairy Farm, Weeks Mills. Class B

<i>YEAR</i>	<i>E COLI GEOMEAN</i>	<i>E COLI DAYS IN VIOLATION</i>	<i>D.O. DAYS IN VIOLATION</i>	<i>AVERAGE WATER TEMP (°C)</i>
1997	104.2	3 (12)	6 (12)	
1998	279.0	2 (9)	2 (2)	
1999	64.8	1 (12)	7 (10)	
2000	147.3	3 (12)	0 (12)	
2001	173.0	3 (11)	7 (10)	
2002	61.0	2 (12)	6 (11)	15.5
2003	63.4	0 (11)	7 (11)	14.9
2004	623.5	6 (9)	6 (9)	15.0
2005	86.3	0 (13)	5 (12)	16.4
2006	160.9	2 (13)	4 (10)	15.8
2007	179.5	4 (9)	3 (9)	12.7
2008	129.0	3 (11)	3 (11)	14.6
2009	94.6	1 (11)	2 (11)*	14.9

*1(11) non-attainment of 75% standard only

WB005-F

West Branch Sheepscot River. Below Foot Bridge off of Water Street, Palermo. Class AA

<i>YEAR</i>	<i>E COLI GEOMEAN</i>	<i>E COLI DAYS IN VIOLATION (1/2B STD)</i>	<i>E COLI DAYS IN VIOLATION (B STANDARD)</i>	<i>E COLI DAYS IN VIOLATION (GPA)</i>	<i>D.O. DAYS IN VIOLATION</i>	<i>AVERAGE WATER TEMP (°C)</i>
1995	23.4	0 (10)			8 (12)	
1996	7.7	0 (12)			2 (12)	
1997	21.5	0 (10)			8 (12)	
1998	71.1	1 (11)			4 (11)	
1999	55.6	1 (12)			2 (12)	
2000	51.7	1 (11)			5 (11)	
2001	71.7	0 (12)			7 (12)	
2002	32.0	0 (12)			6 (12)	17.3
2003	12.5	0 (11)			4 (11)	17.9
2004	13.2	0 (8)			3 (8)	18.8
2005	8.2	0 (11)			0 (11)	19.4
2006	8.7	0 (12)			1 (7)	20.3
2007	13.3	0 (11)	0 (11)		5 (10)	18.6
2008	14.1	0 (11)	0 (11)		2 (10)	18.8
2009	5.8			0 (9)	3 (11)*	18.2

*1(11) non-attainment of 75% standard only