Division of Water Quality
Intensive Survey Unit

January 8, 2007

MEMORANDUM

To: Pam Behm, Modeling/TMDL Unit

Through: Dianne Reid, Intensive Survey Unit

From: Harold Quidley, Intensive Survey Unit

Subject: Mercury Study Extension Data, 2005-2006

Accompanying this memo is the water and sediment data from the North Carolina Mercury Study Extension (2004-2006). This study is an extension of the Eastern Regional Mercury Study (ERMS) conducted by the Division of Water Quality in 2002 and 2003. If you need additional information regarding these data please contact Dianne Reid or Harold Quidley (Intensive survey Unit (919) 733-6510).

Cc: Alan Clark
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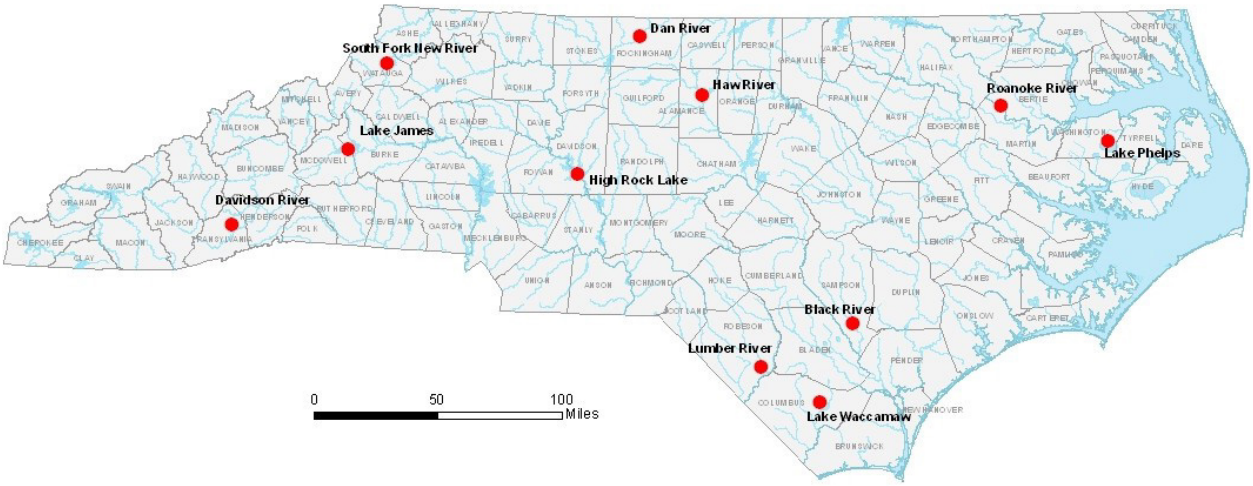
North Carolina Mercury Study Extension 2004-2006

The Eastern Regional Mercury Study (ERMS) to determine low level mercury concentrations in eastern North Carolina surface waters and sediments began in November 2002. That study was completed in July 2003 and consisted of quarterly (fall, winter, spring and summer) surface water and sediment sampling at 11 sites in Eastern North Carolina. One-time total mercury sampling (winter only) of effluents at 38 NPDES wastewater treatment facilities was also conducted.

In 2004 the study was extended to include additional sampling at three of the 2002-2003 sites and at eight new sites. This report presents those data. The study was expanded to included waters in the central and western portions of the state (Fig. 1). Sampling locations for the North Carolina Mercury Study Extension 2004-2006 are as follows:

Sampling Location	Subbasin
Lake Phelps, Washington Co.	030253
Black River near Hwy 411, Sampson Co.	030619
Lake Waccamaw, Columbus Co.	030756
Roanoke River at Hwy 11, Martin Co.	030208
Lumber River at SR2121, Robeson Co.	030757
Haw River at Haw River, Alamance Co.	030602
High Rock Lake, Davidson Co.	030704
Dan River near Wentworth, Rockingham Co.	030203
Lake James, Burke Co.	030830
South Fork New River, Ashe Co.	050701
Davidson River near Brevard, Transylvania Co.	040303

Figure 1: Mercury Study Extension 2004-2006 Sampling Locations



Resulting data from the ERMS and the Mercury Study Extension are intended to provide useful information regarding the ambient levels of mercury in surface water and sediment, and to assist in the development of Total Maximum Daily Loads (TMDLs). Quarterly sampling was conducted during both studies to address seasonal variations at the study sites. Additional parameters collected at the sites included field-filtered total and monomethyl mercury, sediment mercury analysis, sulfate, dissolved organic carbon, nutrients and physical parameters.

Trace-level mercury sampling (total and monomethyl) was conducted using EPA's Method 1669 (Sampling Ambient Water for Trace Metals at EPA Water Criteria Levels). This method allowed detection levels at three orders of magnitude lower than the method currently used by DWQ for water and sediment. This water sampling methodology includes the use of clean hands/dirty hands procedures and peristaltic pumping of the sample through PTFE tubing into laboratory cleaned and certified Teflon bottles. This methodology significantly reduces the risk of contamination at these low levels of detection. The method is performance based with strict adherence to QA procedures including field and laboratory blanks. Brooks Rand LLC in Seattle, Washington performed trace-level analysis and equipment cleaning and certification.

Pumping a Hg Field Blank sample using clean/dirty hands procedure.

Data for the North Carolina Mercury Study Extension 2004-2006 are presented in Tables 1 through 3 (see attached). Mercury data with sulfate and DOC are presented in Table 1, sediment data is presented in Table 2 and corresponding physical and chemical data can be found in Table 3. A total of 138 total mercury samples were collected consisting of 69 field samples each with an accompanying field blank sample. Of the 69 sets of total mercury samples, data from 5 sets were discarded due to contamination of field blank samples. A total of 138 monomethyl mercury samples were also collected consisting of 69 field samples and 69 field blank samples. Of the 69 sets of monomethyl mercury samples, 1 set was discarded due to contamination of the field blank.

Total mercury values for field samples ranged from 0.18 ng/L to 5.80 ng/L with no sample exceeding the North Carolina state standard of 12 ng/L. The mean value for all total mercury field samples was 1.60 ng/L (median value 1.08 ng/L). Both of the highest values for total mercury and monomethyl mercury were from the Lumber River basin. Monomethyl mercury field sample values ranged from 0.02 ng/L (method detection limit) to 0.82 ng/L. The mean value for all monomethyl mercury field samples was 0.07 ng/L (median value 0.04 ng/L).

Sediment analysis consisted of total mercury, monomethyl mercury, TOC and percent solids. Total mercury in sediments ranged from 1.05 ng/g to 81.73 ng/g with an average value of 13.75 ng/g (dry). Monomethyl mercury in sediments ranged from 0.01 ng/g to 1.14 ng/g with an average of 0.11 ng/g (dry). The sediment containing the highest total mercury and monomethyl mercury was collected in the Roanoke River basin. TOC values ranged from 500.00 mg/kg (dry) to 19000.00 mg/kg (dry).

Chemical and physical values were reported at levels that were considered seasonally typical for each of the subbasins where the sampling sites were located. Data qualifier codes are presented at the bottom of Table 1.

Table 1.Trace-level Mercury Study 2004-2006 - Water Samples (Mercury, DOC and Sulfate)

	Quarter	Sample Type	ID Number	Date	Time	Hg Total ng/L	Hg Monomethyl ng/L	DOC mg/L	Sulfate mg/L
Lake Phelps									
	fall	field blank	DWQ5	11/17/04	1100	0.100 (U)		2.20	20.50
		sample	DWQ7	11/17/04	1100	0.513			
		field blank	DWQ6	11/17/04	1100		0.020 (U)		
		sample	DWQ8	11/17/04	1100		0.060		
	winter	field blank	DWQ29	02/08/05	1135	0.100 (U)		1.00 (H, ND)	20.4 (H)
		sample	DWQ31	02/08/05	1135	3.120			
		field blank	DWQ30	02/08/05	1135		0.020 (U, H)		
		sample	DWQ32	02/08/05	1135		0.279 (H)		
(field filtered)		field blank	DWQ33	02/08/05	1135	(FBC)			
(field filtered)		sample	DWQ35	02/08/05	1135	(FBC)			
(field filtered)		field blank	DWQ34	02/08/05	1135		0.020 (U, H)		
(field filtered)		sample	DWQ36	02/08/05	1135		0.034 (B, H)		
	spring	field blank	DWQ93	04/19/05	1200	0.100 (U)		1.33 (H)	20.90 (H)
		sample	DWQ95	04/19/05	1200	1.640			
		field blank	DWQ94	04/19/05	1200		0.020 (H, U)		
		sample	DWQ96	04/19/05	1200		0.064 (H)		
	summer	field blank	DWQ165	07/07/05	1200	0.100 (U)		2.00 (ND)	21.60
		sample	DWQ167	07/07/05	1200	1.370			
		field blank	DWQ166	07/07/05	1200		0.020 (U)		
		sample	DWQ168	07/07/05	1200		0.060		
(field filtered)		field blank	DWQ169	07/07/05	1200	(FBC)			
(field filtered)		sample	DWQ171	07/07/05	1200	(FBC)			
(field filtered)		field blank	DWQ170	07/07/05	1200		0.020 (U)		

Table 1.Trace-level Mercury Study 2004-2006 - Water Samples (Mercury, DOC and Sulfate)

	Quarter	Sample Type	ID Number	Date	Time	Hg Total ng/L	Hg Monomethyl ng/L	DOC mg/L	Sulfate mg/L
(field filtered)		sample	DWQ172	07/07/05	1200		0.040 (B)		
	fall	field blank	DWQ205	09/22/05	1200	0.150 (B)		2.00	21.50
		sample	DWQ208	09/22/05	1200	1.980			
		field blank	DWQ207	09/22/05	1200		0.020 (U)		
		sample	DWQ209	09/22/05	1200		0.071		
	winter	field blank	DWQ300	03/22/06	1000	0.100 (U)		21.30	2.00 (ND)
		sample	DWQ302	03/22/06	1000	1.820			
		field blank	DWQ301	03/22/06	1000		0.020 (U)		
		sample	DWQ303	03/22/06	1000		0.240		
	spring	field blank	DWQ316	05/04/06	1200	0.150 (U)		23.50	(NS) broken
		sample	DWQ318	05/04/06	1200	0.990			
		field blank	DWQ317	05/04/06	1200		(FBC)		
		sample	DWQ319	05/04/06	1200		(FBC)		
(field filtered)		field blank	DWQ320	05/04/06	1200	0.160 (B)			
(field filtered)		sample	DWQ322	05/04/06	1200	0.350 (B)			
(field filtered)		field blank	DWQ321	05/04/06	1200		0.020 (U)		
(field filtered)		sample	DWQ323	05/04/06	1200		0.037 (B)		
	summer	field blank	DWQ328	07/24/06	1200	0.150 (U)		26.50	2.00 (ND)
		sample	DWQ330	07/24/06	1200	1.080			
		field blank	DWQ329	07/24/06	1200		0.020 (U)		
		sample	DWQ331	07/24/06	1200		0.055		

Table 1.Trace-level Mercury Study 2004-2006 - Water Samples (Mercury, DOC and Sulfate)

	Quarter	Sample Type	ID Number	Date	Time	Hg Total ng/L	Hg Monomethyl ng/L	DOC mg/L	Sulfate mg/L
Black River near Hwy 411									
	fall	field blank	DWQ10	11/18/04	0930	0.118 (B)		12.30	11.10
		sample	DWQ9	11/18/04	0930	2.020			
		field blank	DWQ11	11/18/04	0930		0.020 (U)		
		sample	DWQ12	11/18/04	0930		0.182		
	winter	field blank	DWQ21	02/02/05	1200	0.100 (U)		6.23	10.10
		sample	DWQ23	02/02/05	1200	1.230			
		field blank	DWQ22	02/02/05	1200		0.020 (U)		
		sample	DWQ24	02/02/05	1200		0.132		
(field filtered)		field blank	DWQ25	02/02/05	1200	0.100 (U)			
(field filtered)		sample	DWQ27	02/02/05	1200	0.853			
(field filtered)		field blank	DWQ26	02/02/05	1200		0.020 (U)		
(field filtered)		sample	DWQ28	02/02/05	1200		0.096		
	spring	field blank	DWQ101	04/21/05	1200	0.100 (U)		9.14	6.12
		sample	DWQ103	04/21/05	1200	3.140			
		field blank	DWQ102	04/21/05	1200		0.020 (U)		
		sample	DWQ104	04/21/05	1200		0.406		
	summer	field blank	DWQ242	07/20/05	1200	0.100 (U)		12.50	8.20
		sample	DWQ244	07/20/05	1200	2.120			
		field blank	DWQ243	07/20/05	1200		0.020 (U)		
		sample	DWQ245	07/20/05	1200		0.233		
(field filtered)		field blank	DWQ246	07/20/05	1200	0.100 (U)			
(field filtered)		sample	DWQ248	07/20/05	1200	0.721 (B)			

Table 1.Trace-level Mercury Study 2004-2006 - Water Samples (Mercury, DOC and Sulfate)

	Quarter	Sample Type	ID Number	Date	Time	Hg Total ng/L	Hg Monomethyl ng/L	DOC mg/L	Sulfate mg/L
(field filtered)		field blank	DWQ247	07/20/05	1200		0.020 (U)		
(field filtered)		sample	DWQ249	07/20/05	1200		0.080		
	fall	field blank	DWQ234	10/19/05	1200	0.100 (U)		13.60	1.18
		sample	DWQ236	10/19/05	1200	1.210			
		field blank	DWQ235	10/19/05	1200		0.020 (U)		
		sample	DWQ237	10/19/05	1200		0.435		
Lake Waccamaw at Dam									
	fall	field blank	DWQ1	11/16/04	1030	0.100 (U)		17.00	3.86
		sample	DWQ3	11/16/04	1030	2.580			
		field blank	DWQ2	11/16/04	1030		0.020 (U)		
		sample	DWQ4	11/16/04	1030		0.179		
	winter	field blank	DWQ13	01/26/05	1035	0.100 (U)		13.10	3.79
		sample	DWQ15	01/26/05	1035	4.350			
		field blank	DWQ14	01/26/05	1035		0.020 (U)		
		sample	DWQ16	01/26/05	1035		0.132		
(field filtered)		field blank	DWQ17	01/26/05	1035	(FBC)			
(field filtered)		sample	DWQ19	01/26/05	1035	(FBC)			
(field filtered)		field blank	DWQ18	01/26/05	1035		0.020 (U)		
(field filtered)		sample	DWQ20	01/26/05	1035		0.122		
	spring	field blank	DWQ77	04/11/05	1100	0.100 (U)		NS Broken	3.92
		sample	DWQ79	04/11/05	1100	1.160			
		field blank	DWQ78	04/11/05	1100		0.020 (U)		

Table 1.Trace-level Mercury Study 2004-2006 - Water Samples (Mercury, DOC and Sulfate)

	Quarter	Sample Type	ID Number	Date	Time	Hg Total ng/L	Hg Monomethyl ng/L	DOC mg/L	Sulfate mg/L
		sample	DWQ80	04/11/05	1100		0.148		
	summer	field blank	DWQ173	07/13/05	1200	0.100 (U)		14.80	3.49
		sample	DWQ175	07/13/05	1200	2.120			
		field blank	DWQ174	07/13/05	1200		0.020 (M, U)		
		sample	DWQ176	07/13/05	1200		0.213		
(field filtered)		field blank	DWQ177	07/13/05	1200	0.100 (U)			
(field filtered)		sample	DWQ179	07/13/05	1200	0.210 (B)			
(field filtered)		field blank	DWQ178	07/13/05	1200		0.020 (U)		
(field filtered)		sample	DWQ180	07/13/05	1200		0.137		
	fall	field blank	DWQ218	09/29/05	1200	0.100 (U)		17.40	3.36
		sample	DWQ220	09/29/05	1200	1.670			
		field blank	DWQ219	09/29/05	1200		0.020 (U)		
		sample	DWQ221	09/29/05	1200		0.324		
	winter	field blank	DWQ304	03/27/06	1100	0.200 (B)		3.70	18.30
		sample	DWQ306	03/27/06	1100	2.630			
		field blank	DWQ305	03/27/06	1100		0.020 (U)		
		sample	DWQ307	03/27/06	1100		0.115		
	spring	field blank	DWQ308	04/11/06	1230	0.100 (U)		14.00	3.38
		sample	DWQ310	04/11/06	1230	2.030			
		field blank	DWQ309	04/11/06	1230		0.021 (B)		
		sample	DWQ311	04/11/06	1230		0.083		
(field filtered)		field blank	DQW312	04/12/06	1230	0.110 (B)			

Table 1.Trace-level Mercury Study 2004-2006 - Water Samples (Mercury, DOC and Sulfate)

	Quarter	Sample Type	ID Number	Date	Time	Hg Total ng/L	Hg Monomethyl ng/L	DOC mg/L	Sulfate mg/L
(field filtered)		sample	DWQ314	04/12/06	1230	1.890			
(field filtered)		field blank	DWQ313	04/12/06	1230		0.020 (U)		
(field filtered)		sample	DWQ315	04/12/06	1230		0.085		
	summer	field blank	DWQ324	07/13/06	1200	0.150		3.53	13.20
		sample	DWQ326	07/13/06	1200	1.000			
		field blank	DWQ325	07/13/06	1200		0.020 (U)		
		sample	DWQ327	07/13/06	1200		0.067		
Roanoke River at Hwy 11									
	winter	field blank	DWQ53	03/03/05	1130	0.100 (U)		3.26	8.14
		sample	DWQ55	03/03/05	1130	1.990			
		field blank	DWQ54	03/03/05	1130		0.020 (U)		
		sample	DWQ56	03/03/05	1130		0.034 (B)		
	spring	field blank	DWQ85	04/12/05	1100	0.100 (U)		4.52	7.42
		sample	DWQ87	04/12/05	1100	2.240			
		field blank	DWQ86	04/12/05	1100		0.030 (B)		
		sample	DWQ88	04/12/05	1100		0.153		
	summer	field blank	DWQ181	07/19/05	1200	0.100 (U)		3.18	8.45
		sample	DWQ183	07/19/05	1200	1.380			
		field blank	DWQ182	07/19/05	1200		0.020 (U)		
		sample	DWQ184	07/19/05	1200		0.020 (U)		
(field filtered)		field blank	DWQ185	07/19/05	1200	0.110 (B)			
(field filtered)		sample	DWQ187	07/19/05	1200	0.180 (B)			
(field filtered)		field blank	DWQ186	07/19/05	1200		0.020 (U)		

Table 1.Trace-level Mercury Study 2004-2006 - Water Samples (Mercury, DOC and Sulfate)

	Quarter	Sample Type	ID Number	Date	Time	Hg Total ng/L	Hg Monomethyl ng/L	DOC mg/L	Sulfate mg/L
(field filtered)		sample	DWQ188	07/19/05	1200		0.025 (B)		
	fall	field blank	DWQ226	10/13/05	1200	0.100 (U)		3.50	9.02
		sample	DWQ228	10/13/05	1200	1.620			
		field blank	DWQ227	10/13/05	1200		0.020 (U)		
		sample	DWQ229	10/13/05	1200		0.032 (B)		
Lumber River at SR2121									
	winter	field blank	DWQ49	03/02/05	1000	0.100 (U)		6.83	8.26
		sample	DWQ51	03/02/05	1000	1.500			
		field blank	DWQ50	03/02/05	1000		0.020 (U)		
		sample	DWQ52	03/02/05	1000		0.252		
	spring	field blank	DWQ81	04/11/05	1400	0.100 (U)		10.60	5.77
		sample	DWQ83	04/11/05	1400	1.810			
		field blank	DWQ82	04/11/05	1400		0.020 (U)		
		sample	DWQ84	04/11/05	1400		0.812		
	summer	field blank	DWQ149	06/21/05	1300	0.100 (U)		11.40	8.65
		sample	DWQ151	06/21/05	1300	5.800			
		field blank	DWQ150	06/21/05	1300		0.020 (U)		
		sample	DWQ152	06/21/05	1300		0.817		
(field filtered)		field blank	DWQ153	06/21/05	1300	0.100 (U)			
(field filtered)		sample	DWQ155	06/21/05	1300	3.200			
(field filtered)		field blank	DWQ154	06/21/05	1300		0.030 (B)		
(field filtered)		sample	DWQ156	06/21/05	1300		0.771		

Table 1.Trace-level Mercury Study 2004-2006 - Water Samples (Mercury, DOC and Sulfate)

	Quarter	Sample Type	ID Number	Date	Time	Hg Total ng/L	Hg Monomethyl ng/L	DOC mg/L	Sulfate mg/L
	fall	field blank	DWQ238	10/25/05	1200	0.100		10.70	15.10
		sample	DWQ240	10/25/05	1200	3.990			
		field blank	DWQ239	10/25/05	1200		0.020		
		sample	DWQ241	10/25/05	1200		0.541		
Haw River at Haw River									
	winter	field blank	DWQ41	02/22/05	1000	0.100 (U)		4.26	28.00
		sample	DWQ43	02/22/05	1000	1.770			
		field blank	DWQ42	02/22/05	1000		0.020 (U)		
		sample	DWQ44	02/22/05	1000		0.047 (B)		
	spring	field blank	DWQ73	04/06/05	1000	0.100 (U)		4.80 (H)	16.60 (H)
		sample	DWQ75	04/06/05	1000	2.650			
		field blank	DWQ74	04/06/05	1000		0.020 (H, U)		
		sample	DWQ76	04/06/05	1000		0.080 (H)		
	summer	field blank	DWQ141	06/16/05	1300	0.100 (U)		4.82	11.20
		sample	DWQ143	06/16/05	1300	3.420			
		field blank	DWQ142	06/16/05	1300		0.020 (U)		
		sample	DWQ144	06/16/05	1300		0.127		
(field filtered)		field blank	DWQ145	06/16/05	1300	0.110 (B)			
(field filtered)		sample	DWQ147	06/16/05	1300	1.680			
(field filtered)		field blank	DWQ146	06/16/05	1300		0.020 (U)		
(field filtered)		sample	DWQ148	06/16/05	1300		0.088		
	fall	field blank	DWQ197	09/20/05	1000	0.100 (U)		10.50	80.20

Table 1.Trace-level Mercury Study 2004-2006 - Water Samples (Mercury, DOC and Sulfate)

	Quarter	Sample Type	ID Number	Date	Time	Hg Total ng/L	Hg Monomethyl ng/L	DOC mg/L	Sulfate mg/L
		sample	DWQ199	09/20/05	1000	1.880			
		field blank	DWQ198	09/20/05	1000		0.020 (U)		
		sample	DWQ200	09/20/05	1000		0.089		
High Rock Lake near YAD169B									
	winter	field blank	DWQ65	03/14/05	1100	0.100 (U)		1.00 (ND)	6.22
		sample	DWQ67	03/14/05	1100	1.790			
		field blank	DWQ66	03/14/05	1100		0.020 (U)		
		sample	DWQ68	03/14/05	1100		0.046 (B)		
	spring	field blank	DWQ97	04/20/05	1140	(FBC)		2.75 (H)	5.87
		sample	DWQ99	04/20/05	1140	(FBC)			
		field blank	DWQ98	04/20/05	1140		0.020 (U)		
		sample	DWQ100	04/20/05	1140		0.047 (B, H)		
	summer	field blank	DWQ157	07/06/05	1130	0.100 (U)		5.36	5.75
		sample	DWQ159	07/06/05	1130	0.730			
		field blank	DWQ158	07/06/05	1130		0.020 (U)		
		sample	DWQ160	07/06/05	1130		0.038 (B)		
(field filtered)		field blank	DWQ161	07/06/05	1130	0.150 (B)			
(field filtered)		sample	DWQ163	07/06/05	1130	0.270			
(field filtered)		field blank	DWQ162	07/06/05	1130		0.022 (B)		
(field filtered)		sample	DWQ164	07/06/05	1130		0.020 (U)		
	fall	field blank	DWQ214	09/28/05	1200	0.100 (U)		4.20	5.10
		sample	DWQ216	09/28/05	1200	0.800			

Table 1.Trace-level Mercury Study 2004-2006 - Water Samples (Mercury, DOC and Sulfate)

	Quarter	Sample Type	ID Number	Date	Time	Hg Total ng/L	Hg Monomethyl ng/L	DOC mg/L	Sulfate mg/L
		field blank	DWQ215	09/28/05	1200		0.02 (U)		
		sample	DWQ217	09/28/05	1200		0.023 (B)		
Dan River near Wentworth									
	winter	field blank	DWQ57	03/09/05	1130	0.100 (U)		2.11	3.87
		sample	DWQ59	03/09/05	1130	1.570			
		field blank	DWQ58	03/09/05	1130		0.020 (U)		
		sample	DWQ60	03/09/05	1130		0.067		
	spring	field blank	DWQ89	04/18/05	1200	0.100 (U)		1.61 (H)	3.66 (H)
		sample	DWQ91	04/18/05	1200	1.080			
		field blank	DWQ90	04/18/05	1200		0.020 (H, U)		
		sample	DWQ92	04/18/05	1200		0.050 (H, B)		
	summer	field blank	DWQ133	06/16/05	1030	0.100 (U)		1.79	3.50
		sample	DWQ135	06/16/05	1030	2.940			
		field blank	DWQ134	06/16/05	1030		0.020 (U)		
		sample	DWQ136	06/16/05	1030		0.223		
(field filtered)		field blank	DWQ137	06/16/05	1030	0.100 (B)			
(field filtered)		sample	DWQ139	06/16/05	1030	1.760			
(field filtered)		field blank	DWQ138	06/16/05	1030		0.020 (U)		
(field filtered)		sample	DWQ140	06/16/05	1030		0.067		
	fall	field blank	DWQ230	10/17/05	1200	0.100 (U)		2.40	3.61
		sample	DWQ232	10/17/05	1200	2.140			
		field blank	DWQ231	10/17/05	1200		0.020 (U)		
		sample	DWQ233	10/17/05	1200		0.083		

Table 1.Trace-level Mercury Study 2004-2006 - Water Samples (Mercury, DOC and Sulfate)

	Quarter	Sample Type	ID Number	Date	Time	Hg Total ng/L	Hg Monomethyl ng/L	DOC mg/L	Sulfate mg/L
Lake James									
	winter	field blank	DWQ69	03/15/05	1200	0.143 (B)		1.00 (H, ND)	3.56 (H)
		sample	DWQ71	03/15/05	1200	0.500			
		field blank	DWQ70	03/15/05	1200		0.020 (H, U)		
		sample	DWQ72	03/15/05	1200		0.020 (H, U)		
	spring	field blank	DWQ109	05/03/05	0830	0.100 (U)		1.00 (ND)	5.26
		sample	DWQ111	05/03/05	0830	0.744			
		field blank	DWQ110	05/03/05	0830		0.020 (U)		
		sample	DWQ112	05/03/05	0830		0.066		
	summer	field blank	DWQ189	07/21/05	1200	0.100 (U)		2.00 (ND)	3.06
		sample	DWQ191	07/21/05	1200	0.540			
	*	field blank	DWQ197	08/03/05	1200		0.020 (U)		
	*	sample	DWQ198	08/03/05	1200		0.020 (U)		
(field filtered)		field blank	DWQ193	07/21/05	1200	0.100 (U)			
(field filtered)		sample	DWQ195	07/21/05	1200	0.280			
(field filtered)		field blank	DWQ194	07/21/05	1200		0.020 (U)		
(field filtered)		sample	DWQ196	07/21/05	1200		0.055		
	fall	field blank	DWQ201	09/21/05	1200	0.100 (U)		2.50	3.03
		sample	DWQ203	09/21/05	1200	0.370			
		field blank	DWQ202	09/21/05	1200		0.020 (U)		
		sample	DWQ204	09/21/05	1200		0.020 (U)		

Table 1.Trace-level Mercury Study 2004-2006 - Water Samples (Mercury, DOC and Sulfate)

	Quarter	Sample Type	ID Number	Date	Time	Hg Total ng/L	Hg Monomethyl ng/L	DOC mg/L	Sulfate mg/L
South Fork New River at Wagoner Park									
	winter	field blank	DWQ61	03/10/05	1100	0.100 (U)		1.29	2.61
		sample	DWQ63	03/10/05	1100	0.947			
		field blank	DWQ62	03/10/05	1100		0.020 (U)		
		sample	DWQ64	03/10/05	1100		0.023 (B)		
	spring	field blank	DWQ105	05/02/05	1130	0.100 (U)		1.22	2.64
		sample	DWQ107	05/02/05	1130	1.080			
		field blank	DWQ106	05/02/05	1130		0.020 (U)		
		sample	DWQ108	05/02/05	1130		0.040 (B)		
	summer	field blank	DWQ125	06/15/05	1330	0.100 (U)		3.15 (H)	3.25
		sample	DWQ127	06/15/05	1330	3.860			
		field blank	DWQ126	06/15/05	1330		0.020 (U)		
		sample	DWQ128	06/15/05	1330		0.182		
(field filtered)		field blank	DWQ129	06/15/05	1330	(FBC)			
(field filtered)		sample	DWQ131	06/15/05	1330	(FBC)			
(field filtered)		field blank	DWQ130	06/15/05	1330		0.033		
(field filtered)		sample	DWQ132	06/15/05	1330		0.071		
	fall	field blank	DWQ222	10/11/05	1200	0.100		2.10	3.20
		sample	DWQ224	10/11/05	1200	1.050			
		field blank	DWQ223	10/11/05	1200		0.020 (U)		
		sample	DWQ225	10/11/05	1200		0.037 (B)		
Davidson River near Brevard									
	winter	field blank	DWQ45	02/23/05	1000	0.100 (U)		1.00 (H, ND)	1.11 (H)

Table 1.Trace-level Mercury Study 2004-2006 - Water Samples (Mercury, DOC and Sulfate)

	Quarter	Sample Type	ID Number	Date	Time	Hg Total ng/L	Hg Monomethyl ng/L	DOC mg/L	Sulfate mg/L
		sample	DWQ47	02/23/05	1000	0.753			
		field blank	DWQ46	02/23/05	1000		0.020 (H, U)		
		sample	DWQ48	02/23/05	1000		0.020 (H, U)		
	spring	field blank	DWQ113	05/04/05	0830	0.100 (U)		1.90	1.01
		sample	DWQ115	05/04/05	0830	0.855			
		field blank	DWQ114	05/04/05	0830		0.020 (U)		
		sample	DWQ116	05/04/05	0830		0.020 (U)		
	summer	field blank	DWQ117	06/14/05	1330	0.100 (U)		1.00 (ND)	1.23
		sample	DWQ119	06/14/05	1330	2.160			
		field blank	DWQ118	06/14/05	1330		0.020 (U)		
		sample	DWQ120	06/14/05	1330		0.084		
(field filtered)		field blank	DWQ121	06/14/05	1330	0.100 (U)			
(field filtered)		sample	DWQ123	06/14/05	1330	1.130			
(field filtered)		field blank	DWQ122	06/14/05	1330		0.020 (U)		
(field filtered)		sample	DWQ124	06/14/05	1330		0.021 (B)		
	fall	field blank	DWQ210	09/27/05	1400	0.100 (U)		2.00 (ND)	0.48
		sample	DWQ212	09/27/05	1400	1.210			
		field blank	DWQ211	09/27/05	1400		0.020 (U)		
		sample	DWQ213	09/27/05	1400		0.046 (B)		
Fishing Creek at Hwy 301 (One time sample event only)									
	winter	field blank	DWQ37	02/17/05	1200	0.100 (U)		2.79	2.78
		sample	DWQ39	02/17/05	1200	0.992			

Table 1.Trace-level Mercury Study 2004-2006 - Water Samples (Mercury, DOC and Sulfate)

Quarter	Sample Type	ID Number	Date	Time	Hg Total ng/L	Hg Monomethyl ng/L	DOC mg/L	Sulfate mg/L
	field blank	DWQ38	02/17/05	1200		0.020 (U)		
	sample	DWQ40	02/17/05	1200		0.080		

Data Qualifier Codes

FBC Field blank contamination, sample set discarded

ND Results below the detection level for non-detect and are reported at the MDL.

H Temperature of sample received exceeds method criterion

U Results below the detection level for non-detect and are reported at the MDL.

B Results above the detection limit and below the quantitation limit, for estimation.

NS Parameter not sampled or sample container broken during shipping

* Note: monomethyl Hg samples DWQ197 and DWQ198 were sampled on 08/03/05, all other parameters for the Lake James summer sampling event were sampled on 7/21/05.

Table 2. Trace-level Mercury Study – Sediment Data 205-2006

Station	Date m/d/y	Time	% Solids % solids	Hg total ng/g (dry)	Hg (Monomethyl) ng/g (dry)	TOC mg/kg (dry)	
Lake Phelps	02/08/05	1135	57.70	12.400 (H)	0.372 (H)	14100.00	(Split sample A)
State Park	02/08/05	1135	57.70	11.200 (H)	0.494 (H)	18600.00	(Split sample B)
	08/31/05	1330	67.18	4.644	0.015 (U)	5460.00	
	05/05/06	1200	76.96	1.090	0.038	850.00	
Black River near Hwy 411	07/20/05	1200	74.02	5.053	0.02 (B)	1510.00	
Lake Waccamaw	01/26/05	1035	80.95	6.251	0.095	4010.00	
at Dam	07/13/05	1200	78.18	1.806	0.018	810.00	
	04/12/06	1230	80.18	1.048	0.007 (U)	662.00 (ND)	
Roanoke River at Hwy 11	07/19/05	1200	57.51	81.725	0.155	11500.00	
Lumber River at SR2121	06/21/05	1300	81.60	16.544	0.099	2900.00	
Haw River at Haw River	07/16/05	1300	67.58	67.624	0.102	10000.00	
High Rock Lake near YAD169B	08/17/05	1030	73.38	3.898	0.014	500.00	
Dan River near Wentworth	06/16/05	1030	52.50	28.011	1.139	19000.00	
Lake James	07/21/05	1200	69.91	5.922	0.031	772.00	
S. Fork New R. Wagoner Park	07/15/05	1330	78.41	3.641	0.020	14000.00	
Davidson River near Brevard	06/14/O5	1330	73.94	3.638	0.057	2000.00	

Table 3. Trace-level Mercury Study 2004-2006 - Chemical Physical Data

Station	Quarter	Date	Time	D.O. mg/L	Temp °C	pH units	Cond umhos/cm	NH3 mg/L	TKN mg/L	NO2+NO3 mg/L	P Total mg/L	TSS mg/L
Lake Phelps State Park	fall	11/17/04	1100	7.9	9.8	4.9	100	0.02 (U)	0.24	0.02	0.02 (U)	3
	winter	02/08/05	1135	10.4	6.6	4.9	87	0.02 (U)	0.02 (U)	0.02 (U)	0.02 (U)	38
	spring	04/19/05	1200	10.6	17.7	4.2	98	0.05	0.75	0.04	0.07	10
	summer	07/07/05	1200	7.5	30.1	3.9	103	0.02	0.23	0.02	0.02 (U)	5
	fall	09/22/05	1200	6.5	28.1	4.2	111	0.02 (U)	0.20	0.02	0.02 (U)	21
	winter	03/22/06	1000	9.2	13.8	4.4	94	0.02 (U)	0.20	0.02	0.02	4
	spring	05/04/06	1200	8.1	21.2	4.8	97	0.03	0.31	0.03	0.02 (U)	9
	summer	07/24/06	1200	7.0	28.0	4.6	111	0.02 (U)	0.23	0.02	0.02 (U)	10
Black River near Hwy 411	fall	11/18/04	0930	12.6	9.4	6.4	128	0.05	0.50	0.34	0.06	8.5
	winter	02/02/05	1130	10.8	5.6	6.2	104	0.05	0.53	0.95	0.08	20
	spring	04/21/05	1200	7.6	19.1	5.7	85	0.03	0.42	0.57	0.08	16
	summer	07/19/05	1200	5.9	27.4	6.0	108	0.02	0.82	0.18	0.10	23
	fall	10/19/05	1200	6.7	17.0	6.2	103	0.03	0.50	0.35	0.10	12
Lake Waccamaw at Dam	fall	11/16/04	1030	10.8	10.5	6.7	53	0.30	0.60	0.02	0.03	6
	winter	01/26/05	1035	12.2	6.3	6.5	53	0.02 (U)	0.31	0.15	0.02 (U)	18

Table 3. Trace-level Mercury Study 2004-2006 - Chemical Physical Data

Station	Quarter	Date	Time	D.O. mg/L	Temp °C	pH units	Cond umhos/cm	NH3 mg/L	TKN mg/L	NO2+NO3 mg/L	P Total mg/L	TSS mg/L
	spring	04/11/05	1100	7.9	18.4	6.7	63	0.02 (U)	0.54	0.02 (U)	0.03	10
	summer	07/13/05	1200	6.6	29.6	6.7	42	0.02 (U)	0.59	0.02 (U)	0.03	3
	fall	09/29/05	1200	6.1	27.1	6.4	59	0.03	0.63	0.03	0.03	5
	winter	03/27/06	1100	9.4	13.5	6.5	55	0.02 (U)	0.64	0.02 (U)	0.02 (U)	2.5
	spring	04/11/06	1230	8.1	18.5	6.6	54	0.02 (U)	0.58	0.03	0.03	6
	summer	07/13/06	1200	7.5	29.1	6.5	69	0.02 (U)	0.64	0.03	0.03	10
Roanoke River at Hwy 11	winter	03/03/05	1130	11.0	6.7	6.9	97	0.02 (U)	0.24	0.25	0.03	9
	spring	04/12/05	1100	7.4	20.4	6.6	100	0.02 (U)	0.21	0.20	0.04	38
	summer	07/19/05	1200	5.5	27.4	6.0	106	0.02 (U)	0.29	0.14	0.07	15
	fall	10/13/05	1200	5.2	21.3	6.3	113	0.02	0.22	0.25	0.03	11
Lumber River at SR2121	winter	03/02/05	1000	15.2	6.0	5.9	116	0.07	0.61	0.12	0.06	5
	spring	04/11/05	1400	8.8	21.0	6.6	114	0.04	0.60	0.18	0.08	16
	summer	06/21/05	1300	4.6	23.4	5.5	151	0.05	0.70	0.08	0.13	18
	fall	10/25/05	1200	4.6	15.3	6.2	214	0.03	0.63	0.35	0.13	8
Haw River at Haw River	winter	02/22/05	1000	12.3	8.0	7.7	214	0.30	0.95	1.60	0.31	5 (U)

Table 3. Trace-level Mercury Study 2004-2006 - Chemical Physical Data

Station	Quarter	Date	Time	D.O. mg/L	Temp °C	pH units	Cond umhos/cm	NH3 mg/L	TKN mg/L	NO2+NO3 mg/L	P Total mg/L	TSS mg/L
	spring	04/06/05	1000	8.6	21.2	7.3	194	0.09	0.64	0.54	0.21	27
	summer	06/16/05	1300	8.2	24.1	7.1	160	0.04	0.80	1.30	0.20	38
	fall	09/20/05	1100	6.7	25.6	7.7	285	0.02 (U)	0.55	0.65	0.11	11
High Rock Lake near YAD169B	winter	03/14/05	1100	12.1	10.8	7.2	90	0.17	0.66	0.86	0.18	36
	spring	04/20/05	1140	8.7	20.9	8.6	78	0.07	0.50	0.64	0.07	16
	summer	07/06/05	1130	10.1	30.0	8.8	98	0.02	0.79	0.01	0.06	7
	fall	09/28/05	1200	5.1	26.6	6.8	91	0.12	0.81	0.20	0.08	8.8
Dan River near Wentworth	winter	03/09/05	1130	10.4	9.1	6.3	74	0.25 (U)	0.2 (U)	0.20	0.02	2.5 (U)
	spring	04/18/05	1200	9.9	14.2	6.1	62	0.02 (U)	0.22	0.10	0.03	30
	summer	06/16/05	1030	7.2	22.5	6.5	69	0.02 (U)	0.11	0.20	0.05	3.5
	fall	10/17/05	1200	7.4	15.9	6.8	63	0.02 (U)	0.2 (U)	0.21	0.02	15
Lake James	winter	03/15/05	1200	12.4	8.7	7.1	49	0.05	0.2 (U)	0.18	0.05	2.5 (U)
	spring	05/03/05	0830	8.4	15.4	6.8	44	0.02	0.15	0.07	0.04	2.0 (U)
	summer	07/21/05	1200	7.0	29.0	6.7	46	0.04	0.19	0.13	0.02	5
	fall	10/21/05	1200	7.3	27.3	6.3	39	0.06	0.21	0.04	0.05	2.5 (U)

Table 3. Trace-level Mercury Study 2004-2006 - Chemical Physical Data

Station	Quarter	Date	Time	D.O. mg/L	Temp °C	pH units	Cond umhos/cm	NH3 mg/L	TKN mg/L	NO2+NO3 mg/L	P Total mg/L	TSS mg/L
S. Fork New R. Wagoner Park	winter	03/10/05	1100	9.4	7.3	6.6	82	0.02	0.2 (U)	0.73	0.02	2.5
	spring	05/02/05	1130	9.1	12.1	6.5	62	0.02 (U)	0.2 (U)	0.64	0.02	13
	summer	06/15/05	1330	8.1	21.2	6.8	71	0.02	0.23	0.67	0.04	6
	fall	10/11/05	1200	6.6	17.6	6.9	65	0.02	0.30	0.02 (U)	0.02	8
Davidson River near Brevard	winter	02/23/05	1000	11.2	6.4	6.6	21	0.03	0.20 (U)	0.02 (U)	0.02	2.5 (U)
	spring	05/04/05	0830	9.3	11.4	6.4	18	0.02 (U)	0.21	0.05	0.04	2.5 (U)
	summer	06/14/05	1330	8.9	16.1	5.5	12	0.02 (U)	0.20 (U)	0.06	0.02 (U)	3.3
	fall	09/27/05	1400	8.4	18.0	5.9	15	0.02 (U)	0.24	0.08	0.02 (U)	2.6 (U)