

Table 6 (continued). 2003 MA DEP Blackstone River Watershed Instream Physico/Chemical and Bacteria Data.

Quinsigamond River (SARIS: 5132425) Unique ID: W1018 Station: QU05

Description: Pleasant Street, Grafton

Date	OWMID	QAQC	Time (24hr)	Fecal CFU/100ml	<i>E. coli</i> CFU/100ml	<i>E. coli</i> CFU/100ml	NH3-N mg/L	TP mg/L	TSS mg/L
4/23/2003	51-0119	--	09:45	13	--	<7	--	--	--
5/21/2003	51-0150	--	08:15	39 e,f	--	45 e,f	<0.06 f	0.027 f	2.5 f
6/25/2003	51-0187	--	10:40	160*	--	52*	<0.02	0.027	1.9 j
7/23/2003	51-0231	--	10:30	200	--	130	<0.02	0.043	2.8
8/27/2003	51-0275	--	10:17	--	--	--	<0.02	0.017 d	2.8
8/28/2003	51-0423	--	05:05	84	26	--	--	--	--
10/2/2003	51-0336	--	10:42	13	<6	--	0.46	0.018	<1.0

Blackstone River/Rice City Pond (SARIS: 5131000) (PALIS: 51131) Unique ID: W0670 Station: 670

Description: at sluice way East Hartford Avenue, Uxbridge

Date	OWMID	QAQC	Time (24hr)	Fecal CFU/100ml	<i>E. coli</i> CFU/100ml	<i>E. coli</i> CFU/100ml	NH3-N mg/L	TP mg/L	TSS mg/L
4/23/2003	51-0124	--	08:44	310	--	190	--	--	--

Mumford River (SARIS: 5132050) Unique ID: W1062 Station: BLK09-8A

Description: Manchaug Street, Douglas

Date	OWMID	QAQC	Time (24hr)	Fecal CFU/100ml	<i>E. coli</i> CFU/100ml	<i>E. coli</i> CFU/100ml	NH3-N mg/L	TP mg/L	TSS mg/L
4/23/2003	51-0122	--	08:03	<7	--	<7	--	--	--
5/21/2003	51-0155	--	11:42	19 e,f	--	26 e,f	<0.02 f	0.014 f	<1.0 f
6/25/2003	51-0190	--	08:10	180*	--	110*	<0.02	0.020	1.5 j
7/23/2003	51-0234	--	08:15	3400 e	--	4000 e	<0.02	0.040	2.5 d
8/27/2003	51-0278	--	08:30	--	--	--	<0.02	0.009	<1.0
8/28/2003	51-0444	--	02:41	45	32	--	--	--	--
10/2/2003	51-0342	--	07:57	39	6	--	<0.02	0.013	1.0

Mumford River (SARIS: 5132050) Unique ID: W1025 Station: MF03A

Description: south of Gilboa Street, approximately 500 feet downstream of Gilboa Pond, [just downstream of MA0001538 diffuser pipes], Douglas

Date	OWMID	QAQC	Time (24hr)	Fecal CFU/100ml	<i>E. coli</i> CFU/100ml	<i>E. coli</i> CFU/100ml	NH3-N mg/L	TP mg/L	TSS mg/L
4/23/2003	51-0123	--	08:14	130	--	39	--	--	--
5/21/2003	51-0157	--	12:05	##,f,j	--	##,f,j	<0.06 f	0.20 f	2.6 f
6/25/2003	51-0191	--	08:23	280*	--	200*	0.06	0.028	3.9 j
7/23/2003	51-0235	--	08:26	2000	--	1000	<0.06	0.056	3.4 d
8/27/2003	51-0279	--	08:45	--	--	--	<0.06	0.042	1.7
8/28/2003	51-0443	--	02:54	110	65	--	--	--	--
10/2/2003	51-0344	--	08:10	26 e	39 e	--	0.07	0.052	1.6

Mumford River (SARIS: 5132050) Unique ID: W1020 Station: MF07

Description: Mendon Street (Route 16), downstream of Capron Pond, Uxbridge

Date	OWMID	QAQC	Time (24hr)	Fecal CFU/100ml	<i>E. coli</i> CFU/100ml	<i>E. coli</i> CFU/100ml	NH3-N mg/L	TP mg/L	TSS mg/L
4/23/2003	51-0127	51-0128	09:25	32	--	19	--	--	--
4/23/2003	51-0128	51-0127	09:25	26	--	13	--	--	--
6/25/2003	51-0194	51-0196	09:15	370*	--	200*	<0.02	0.037	1.7 j
6/25/2003	51-0196	51-0194	09:15	308*	--	250*	<0.02	0.039	1.6 j
7/23/2003	51-0238	51-0240	09:16	600	--	540	<0.02	0.046	2.5 d
7/23/2003	51-0240	51-0238	09:16	810	--	590	<0.02	0.041	<1.0 d
8/27/2003	51-0282	51-0283	09:45	--	--	--	<0.02	0.018	<1.0
8/27/2003	51-0283	51-0282	09:45	--	--	--	<0.02	0.023	<1.0
8/28/2003	51-0438	51-0439	03:59	77	65	--	--	--	--
8/28/2003	51-0439	51-0438	03:59	90	84	--	--	--	--
10/2/2003	51-0350	51-0351	09:19	71	52	--	<0.02	0.025	1.6
10/2/2003	51-0351	51-0350	09:19	65 e	71 e	--	<0.02	0.026	1.3

Table 6 (continued). 2003 MA DEP Blackstone River Watershed Instream Physico/Chemical and Bacteria Data.

West River (SARIS: 5131800) Unique ID: W1073 Station: WR12A
 Description: Hartford Avenue South, Upton

Date	OWMID	QAQC	Time (24hr)	Fecal CFU/100ml	<i>E. coli</i> CFU/100ml	<i>E. coli</i> CFU/100ml	NH3-N mg/L	TP mg/L	TSS mg/L
4/23/2003	51-0121	--	10:20	<7	--	<7	--	--	--
5/21/2003	51-0153	--	09:35	52 f	--	39 f	<0.06 f	0.028 f	2.8 f
6/25/2003	51-0189	--	11:28	170*	--	130*	<0.02	0.029	2.3 j
7/23/2003	51-0233	--	11:15	370	--	270	<0.02	0.048	2.1
8/27/2003	51-0277	--	10:52	--	--	--	<0.02	0.034 d	13
8/28/2003	51-0421	--	05:43	530	430	--	--	--	--
10/2/2003	51-0340	--	11:25	90	65	--	<0.02	0.031	2.3

West River (SARIS: 5131800) Unique ID: W0515 Station: WR03
 Description: Hartford Avenue East, Uxbridge

Date	OWMID	QAQC	Time (24hr)	Fecal CFU/100ml	<i>E. coli</i> CFU/100ml	<i>E. coli</i> CFU/100ml	NH3-N mg/L	TP mg/L	TSS mg/L
4/23/2003	51-0125	--	08:55	<7	--	<7	--	--	--
5/21/2003	51-0163	--	08:00	27	--	<7	--	--	--
6/25/2003	51-0192	--	08:43	250*	--	110*	<0.02	0.034	<1.0 j
7/23/2003	51-0236	--	08:50	210 e	--	240 e	<0.06	0.046	1.3 d
8/27/2003	51-0280	--	09:05	--	--	--	0.07	0.024	1.5
8/28/2003	51-0442	--	03:21	120	65	--	--	--	--
10/2/2003	51-0346	--	08:42	13 e	19 e	--	<0.02	0.030	<1.0

West River (SARIS: 5131800) Unique ID: W1019 Station: WR05
 Description: Helca Street, Uxbridge

Date	OWMID	QAQC	Time (24hr)	Fecal CFU/100ml	<i>E. coli</i> CFU/100ml	<i>E. coli</i> CFU/100ml	NH3-N mg/L	TP mg/L	TSS mg/L
4/23/2003	51-0126	--	09:07	27	--	13	--	--	--
5/21/2003	51-0164	--	08:25	52	--	19	<0.06 d	0.032	2.3
6/25/2003	51-0193	--	09:05	200*	--	200*	0.07	0.042	2.2 j
7/23/2003	51-0237	--	09:04	370 e	--	400 e	<0.02	0.053	4.1 d
8/27/2003	51-0281	--	09:20	--	--	--	<0.06	0.024	<1.0
8/28/2003	51-0441	--	03:39	58	26	--	--	--	--
10/2/2003	51-0348	--	09:00	40 e	60 e	--	<0.02	0.029	1.6

Blackstone River (SARIS: 5131000) Unique ID: W1066 Station: BLK12B
 Description: approximately 260 feet upstream/west of Central Street (above braid), Millville

Date	OWMID	QAQC	Time (24hr)	Fecal CFU/100ml	<i>E. coli</i> CFU/100ml	<i>E. coli</i> CFU/100ml	NH3-N mg/L	TP mg/L	TSS mg/L
5/21/2003	51-0166	--	09:05	39 e	--	45 e	0.29 d	0.25	4.8
6/25/2003	51-0197	--	09:40	830*	--	450*	0.09	0.13	5.4 j
7/23/2003	51-0241	--	09:33	2200	--	400	<0.02	0.37	33 d
8/27/2003	51-0285	--	10:05	--	--	--	0.08	0.11	1.7
8/28/2003	51-0437	--	04:16	90	39	--	--	--	--
10/2/2003	51-0354	--	09:40	370	190	--	<0.06	0.31	4.5

Blackstone River (SARIS: 5131000) Unique ID: W1023 Station: BS19
 Description: Bridge Street/Canal Street (upstream of dam), Blackstone

Date	OWMID	QAQC	Time (24hr)	Fecal CFU/100ml	<i>E. coli</i> CFU/100ml	<i>E. coli</i> CFU/100ml	NH3-N mg/L	TP mg/L	TSS mg/L
4/23/2003	51-0130	--	09:50	33	--	33	--	--	--
5/21/2003	51-0168	--	09:40	32	--	19	0.16 d	0.22	5.3
6/25/2003	51-0198	--	10:02	144*	--	130*	0.08	0.12	7.6 j
7/23/2003	51-0242	--	09:54	1400	--	1200	0.08	0.21	20 d
8/27/2003	51-0286	--	10:20	--	--	--	0.07	0.11	3.5
8/28/2003	51-0436	--	04:33	160	58	--	--	--	--
10/2/2003	51-0356	--	10:01	430	250	--	<0.06	0.23	3.5

Table 6 (continued). 2003 MA DEP Blackstone River Watershed Instream Physico/Chemical and Bacteria Data.

Mill River (SARIS: 5131200) Unique ID: W1021 Station: ML01

Description: Route 16 (Mendon Street), Hopedale

Date	OWMID	QAQC	Time (24hr)	Fecal CFU/100ml	<i>E. coli</i> CFU/100ml	<i>E. coli</i> CFU/100ml	NH3-N mg/L	TP mg/L	TSS mg/L
4/23/2003	51-0133	--	10:45	26	--	26	--	--	--
5/21/2003	51-0176	--	11:10	52	--	45	0.06 d	0.023	1.3
6/25/2003	51-0201	--	11:15	170*	--	30*	<0.06	0.029	1.8 j
7/23/2003	51-0245	--	10:47	4200	--	2000	<0.02	0.052	7.4 d
8/27/2003	51-0289	--	11:25	--	--	--	0.09	0.017	1.8
8/28/2003	51-0433	--	05:34	230	180	--	--	--	--
10/2/2003	51-0362	--	11:12	240	190	--	<0.06	0.018	<1.0

Mill River (SARIS: 5131200) Unique ID: W0508 Station: BLK15-1

Description: Summer Street, Blackstone

Date	OWMID	QAQC	Time (24hr)	Fecal CFU/100ml	<i>E. coli</i> CFU/100ml	<i>E. coli</i> CFU/100ml	NH3-N mg/L	TP mg/L	TSS mg/L
4/23/2003	51-0131	--	10:00	58 e	--	120 e	--	--	--
5/21/2003	51-0170	51-0172	10:00	58	--	39	##,d	0.051	2.7
5/21/2003	51-0172	51-0170	10:00	20 e	--	47 e	##,d	0.050	3.8
6/25/2003	51-0199	--	10:18	280*	--	154*	0.07	0.047	3.3 j
7/23/2003	51-0243	--	10:05	4200	--	3600	<0.02	0.11	21 d
8/27/2003	51-0287	--	10:38	--	--	--	0.08	0.028	1.3
8/28/2003	51-0435	--	04:49	220	97	--	--	--	--
10/2/2003	51-0358	--	10:17	32 e	52 e	--	<0.02	0.027	<1.0

Peters River (SARIS: 5131125) Unique ID: W1022 Station: PR01

Description: Paine Street, Bellingham

Date	OWMID	QAQC	Time (24hr)	Fecal CFU/100ml	<i>E. coli</i> CFU/100ml	<i>E. coli</i> CFU/100ml	NH3-N mg/L	TP mg/L	TSS mg/L
4/23/2003	51-0132	--	10:14	520	--	220	--	--	--
5/21/2003	51-0174	--	10:20	300	--	250	<0.06 d	0.029	3.6
6/25/2003	51-0200	--	10:33	512*	--	126*	<0.02	0.041	2.4 j
7/23/2003	51-0244	--	10:16	11000	--	6200	0.09	0.24	59 d
8/27/2003	51-0288	--	10:50	--	--	--	0.07	0.024	<1.0
8/28/2003	51-0434	--	05:03	970	770	--	--	--	--
10/2/2003	51-0360	--	10:35	780	580	--	<0.02	0.020	<1.0

- "##" = Censored data (i.e., data that has been discarded for some reason)
- "*" = Analysis performed by Laboratory other than DEP's Wall Experiment Station (WES)
- "--" = No data (i.e., data not taken/not required)
- "a" = Accuracy as estimated at WES Lab via matrix spikes, PT sample recoveries, internal check standards and lab-fortified blanks did not meet project data quality objectives identified for program or in QAPP
- "d" = Precision of field duplicates (as RPD) did not meet project data quality objectives identified for program or in QAPP. Batched samples may also be affected
- "e" = Not theoretically possible. Specifically, used for bacteria data where colonies per unit volume for e-coli bacteria > fecal coliform bacteria and for other incongruous or conflicting results
- "f" = Frequency of quality control duplicates did not meet data quality objectives identified for program or in QAPP
- "j" = Used for lab-related issues where certain lab QC criteria are not met and re-testing is not possible (as identified by the WES lab only). Also used to report sample data where the sample concentration is less than the 'reporting' limit or RDL and greater than the method detection limit or MDL (mdl < x < rd). Also used to note where values have been reported at levels less than the mdl. Denotes an 'estimated' value when used as a qualifier only (i.e., not censored). When solely used for censored data, it denotes censure at the lab
- "h" = Holding time violation (usually indicating possible bias low)
- "m" = Method SOP not followed (only partially implemented or not implemented at all) due to complications with sample matrix (e.g. sediment in sample, floc formation), lab error (e.g. cross-contamination between samples), additional steps taken by the lab to deal with matrix complications, lost/unanalyzed samples, missing data or deviations from field sampling SOPs
- "r" = Samples collected may not be representative of actual field conditions, based on documented or suspected field sampling error, or inexplicable or improbable ("outliers") values

Quality Control Data

Blackstone River Watershed quality control data for trip blanks and field duplicate samples can be found in Tables 7 and 8. Data qualifiers are presented at the bottom of each table and in Appendix 3. Additional information pertaining to the data validation process is provided in Appendix 2.

Table 7. 2003 MA DEP Blackstone River Watershed Quality Control Data-Blanks.

OWMID (sample ID), Fecal coliform, E. coli, Ammonia Nitrogen (NH3-N), Total Phosphorus (TP), and Total Suspended Solids (TSS)

Date	OWMID	QAQC	Time (24hr)	Fecal CFU/100ml	E. coli CFU/100ml	E. coli CFU/100ml	NH3-N mg/L	TP mg/L	TSS mg/L
4/23/2003	51-0118	Blank	**	<7	--	<7	--	--	--
4/23/2003	51-0129	Blank	**	<7	--	<7	--	--	--
5/21/2003	51-0141	Blank	**	<6	--	<6	<0.02	<0.005	<1.0
5/21/2003	51-0171	Blank	**	<6	--	<6	<0.02	<0.005	<1.0
6/25/2003	51-0182	Blank	**	<2*	--	<2*	<0.02	<0.005	<1.0 j
6/25/2003	51-0195	Blank	**	<2*	--	<2*	<0.02	<0.005 h	<1.0 j
7/23/2003	51-0226	Blank	**	<6	--	<6	<0.02	<0.005	<1.0
7/23/2003	51-0239	Blank	**	<6	--	<6	<0.02	<0.005	<1.0
8/27/2003	51-0270	Blank	**	--	--	--	<0.02	<0.005	<1.0
8/27/2003	51-0284	Blank	**	--	--	--	<0.02	<0.005	<1.0
8/28/2003	51-0429	Blank	**	<6	<6	--	--	--	--
8/28/2003	51-0440	Blank	**	<7	<7	--	--	--	--
10/2/2003	51-0328	Blank	**	<6	<6	--	<0.02	<0.005	<1.0
10/2/2003	51-0352	Blank	09:19	<6	<6	--	<0.02	<0.005	<1.0

- "*" = Analysis performed by Laboratory other than DEP's Wall Experiment Station (WES)
- **" = Missing data (i.e., data that should have been reported)
- "--" = No data (i.e., data not taken/not required)
- "h" = Holding time violation (usually indicating possible bias low)
- "j" = Used for lab-related issues where certain lab QC criteria are not met and re-testing is not possible (as identified by the WES lab only). Also used to report sample data where the sample concentration is less than the 'reporting' limit or RDL and greater than the method detection limit or MDL ($mdl < x < rdl$). Also used to note where values have been reported at levels less than the mdl. Denotes an 'estimated' value' when used as a qualifier only (i.e., not censored). When solely used for censored data, it denotes censure at the lab

Table 8. 2003 MA DEP Blackstone River Watershed Quality Control Data-Duplicates.

OWMID (sample ID), Fecal coliform, E. coli, Ammonia Nitrogen (NH3-N), Total Phosphorus (TP), and Total Suspended Solids (TSS)

Blackstone River (SARIS: 5131000) Unique ID: W1017 Station: BS12

Description: downstream/south of Singing Dam, Blackstone Street, Sutton

Date	OWMID	QAQC	Time (24hr)	Log10(Fecal) CFU/100ml	Log10(E. coli) CFU/100ml	Log10(E. coli) CFU/100ml	NH3-N mg/L	TP mg/L	TSS mg/L
4/23/2003	51-0116	51-0117	09:29	1.987	--	2.000	--	--	--
4/23/2003	51-0117	51-0116	09:29	2.362	--	2.000	--	--	--
Relative	Percent	Difference	--	17.2%	--	0.0%	--	--	--

Mill River (SARIS: 5131200) Unique ID: W0508 Station: BLK15-1

Description: Summer Street, Blackstone

Date	OWMID	QAQC	Time (24hr)	Log10(Fecal) CFU/100ml	Log10(E. coli) CFU/100ml	Log10(E. coli) CFU/100ml	NH3-N mg/L	TP mg/L	TSS mg/L
5/21/2003	51-0170	51-0172	10:00	1.763	--	1.591	##,d	0.051	2.7
5/21/2003	51-0172	51-0170	10:00	1.301	--	1.672	##,d	0.050	3.8
Relative	Percent	Difference	--	30.2%	--	5.0%	--	2.0%	33.8%

Table 8 (continued). 2003 MA DEP Blackstone River Watershed Quality Control Data-Duplicates.

Mumford River (SARIS: 5132050) Unique ID: W1020 Station: MF07
 Description: Mendon Street (Route 16), downstream of Capron Pond, Uxbridge

Date	OWMID	QAQC	Time (24hr)	Log10(Fecal) CFU/100ml	Log10(E. coli) CFU/100ml	Log10(E. coli) CFU/100ml	NH3-N mg/L	TP mg/L	TSS mg/L
4/23/2003	51-0127	51-0128	09:25	1.505	--	1.279	--	--	--
4/23/2003	51-0128	51-0127	09:25	1.415	--	1.114	--	--	--
<i>Relative</i>	<i>Percent</i>	<i>Difference</i>	--	6.2%	--	13.8%	--	--	--
6/25/2003	51-0194	51-0196	09:15	2.568	--	2.301	<0.02	0.037	1.7 j
6/25/2003	51-0196	51-0194	09:15	2.489	--	2.398	<0.02	0.039	1.6 j
<i>Relative</i>	<i>Percent</i>	<i>Difference</i>	--	3.2%	--	4.1%	0.0%	5.3%	6.1%
7/23/2003	51-0238	51-0240	09:16	2.778	--	2.732	<0.02	0.046	2.5 d
7/23/2003	51-0240	51-0238	09:16	2.908	--	2.771	<0.02	0.041	<1.0 d
<i>Relative</i>	<i>Percent</i>	<i>Difference</i>	--	4.6%	--	1.4%	0.0%	11.5%	85.7%
8/27/2003	51-0282	51-0283	09:45	--	--	--	<0.02	0.018	<1.0
8/27/2003	51-0283	51-0282	09:45	--	--	--	<0.02	0.023	<1.0
<i>Relative</i>	<i>Percent</i>	<i>Difference</i>	--	--	--	--	0.0%	24.4%	0.0%
8/28/2003	51-0438	51-0439	03:59	1.886	1.813	--	--	--	--
8/28/2003	51-0439	51-0438	03:59	1.954	1.924	--	--	--	--
<i>Relative</i>	<i>Percent</i>	<i>Difference</i>	--	3.5%	6.0%	--	--	--	--
10/2/2003	51-0350	51-0351	09:19	1.851	1.716	--	<0.02	0.025	1.6
10/2/2003	51-0351	51-0350	09:19	1.813	1.851	--	<0.02	0.026	1.3
<i>Relative</i>	<i>Percent</i>	<i>Difference</i>	--	2.1%	7.6%	--	0.0%	3.9%	20.7%

Dark Brook (SARIS: 5132825) Unique ID: W0504 Station: RB01
 Description: Route 12, Auburn

Date	OWMID	QAQC	Time (24hr)	Log10(Fecal) CFU/100ml	Log10(E. coli) CFU/100ml	Log10(E. coli) CFU/100ml	NH3-N mg/L	TP mg/L	TSS mg/L
5/21/2003	51-0140	51-0142	09:10	2.431	--	2.362	##,d	0.032	3.1
5/21/2003	51-0142	51-0140	09:10	2.415	--	2.462	##,d	0.030	2.7
<i>Relative</i>	<i>Percent</i>	<i>Difference</i>	--	0.7%	--	4.2%	--	6.5%	13.8%
6/25/2003	51-0181	51-0183	09:00	2.362	--	2.146	<0.02	0.039	3.2 j
6/25/2003	51-0183	51-0181	09:00	2.491	--	2.158	<0.02	0.035	3.4 j
<i>Relative</i>	<i>Percent</i>	<i>Difference</i>	--	5.3%	--	0.6%	0.0%	10.8%	6.1%
7/23/2003	51-0225	51-0227	09:05	3.748	--	3.204	<0.02	0.070	4.7
7/23/2003	51-0227	51-0225	09:05	3.845	--	3.146	<0.02	0.069	4.5
<i>Relative</i>	<i>Percent</i>	<i>Difference</i>	--	2.6%	--	1.8%	0.0%	1.4%	4.3%
8/27/2003	51-0269	51-0271	09:00	--	--	--	0.11	##,d	5.1
8/27/2003	51-0271	51-0269	09:00	--	--	--	0.10	##,d	5.5
<i>Relative</i>	<i>Percent</i>	<i>Difference</i>	--	--	--	--	9.5%	--	7.5%
8/28/2003	51-0427	51-0428	03:30	2.146	2.114	--	--	--	--
8/28/2003	51-0428	51-0427	03:30	2.230	2.000	--	--	--	--
<i>Relative</i>	<i>Percent</i>	<i>Difference</i>	--	3.9%	5.5%	--	--	--	--
10/2/2003	51-0326	51-0327	09:05	2.176	1.886	--	0.09	0.040	1.9
10/2/2003	51-0327	51-0326	09:05	2.146	2.255	--	0.09	0.043	1.9
<i>Relative</i>	<i>Percent</i>	<i>Difference</i>	--	1.4%	17.8%	--	0.0%	7.2%	0.0%

"##" = Censored data (i.e., data that has been discarded for some reason)

"--" = No data (i.e., data not taken/not required)

"d" = Precision of field duplicates (as RPD) did not meet project data quality objectives identified for program or in QAPP. Batched samples may also be affected

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Appendix 1
2003 MA DEP Blackstone Sewage Bypass Response

On 2 October 2003, a failure at the UBWPAD, in Millbury, MA, led to the release of millions of gallons of untreated and partially treated sewage into the Blackstone River. Subsequent monitoring by MA DEP in the Massachusetts portion of the river, and DEM, US Filter, the Narragansett Bay Commission, and the Natural Resources Conservation Service in the Rhode Island portion of the river, revealed high fecal coliform bacteria levels down to Uxbridge, MA as of October 6, but declining levels at that location by October 8. The following data are the result of DWM and CERO monitoring in response to the emergency overflow. Tables 1 through 4 and Figure 1 detail locations of the 2003 sampling sites.

Table 1. 2003 MA DEP Blackstone Sewage Bypass Response *in-situ* multiprobe Data.

OWMID (sample ID), Temp (Temperature), pH, Conductivity, Total Dissolved Solids (TDS), Dissolved Oxygen (DO), and Percent Saturation

Blackstone River (SARIS: 5131000) Unique ID: W0505 Station: BLK02

Description: McCracken Road (at the old bridge site which became a butler bridge in the early 2000s), Millbury (approximately 2300 feet downstream of Upper Blackstone WWTP (MA0102369) discharge)

Date	OWMID	Time (24hr)	Depth (m)	Temp (°C)	pH (SU)	Conductivity (µS/cm)	TDS (mg/L)	DO (mg/L)	Saturation (%)
10/3/2003	51-0416	10:50	0.4	17.4	6.9 c	702	456	6.3	66
10/6/2003	51-0388	12:25	0.3	17.6	6.9 c	716	466	6.4	67

Blackstone River (SARIS: 5131000) Unique ID: W1240 Station: Station 1

Description: approximately 60 feet upstream/north of Upper Blackstone WWTP (MA0102369) effluent channel confluence, Millbury

Date	OWMID	Time (24hr)	Depth (m)	Temp (°C)	pH (SU)	Conductivity (µS/cm)	TDS (mg/L)	DO (mg/L)	Saturation (%)
10/3/2003	51-0415	10:33	0.4	12.3	6.9 u,c	592	385	9.0	85
10/6/2003	51-0387	12:40	0.2	11.7	7.2 c	620	403	9.7	89

Blackstone River (SARIS: 5131000) Unique ID: W1241 Station: Station 2

Description: Blackstone River Canal, Pleasant Street, Grafton

Date	OWMID	Time (24hr)	Depth (m)	Temp (°C)	pH (SU)	Conductivity (µS/cm)	TDS (mg/L)	DO (mg/L)	Saturation (%)
10/3/2003	51-0417	11:17	0.3	13.4	7.1 c	658	428	6.1	59
10/6/2003	51-0389	12:02	0.7	13.3	7.1 c	613	398	9.4	90

Blackstone River (SARIS: 5131000) Unique ID: W1242 Station: Station 3

Description: Route 122A (below Fisherville Pond), Grafton

Date	OWMID	Time (24hr)	Depth (m)	Temp (°C)	pH (SU)	Conductivity (µS/cm)	TDS (mg/L)	DO (mg/L)	Saturation (%)
10/3/2003	51-0418	11:38	0.4	14.3	7.2 c	608	395	7.7	75
10/6/2003	51-0390	11:51	0.9	13.5	7.2 c	588	382	10.0	97

Blackstone River (SARIS: 5131000) Unique ID: W1243 Station: Station 4

Description: Depot Street, Grafton

Date	OWMID	Time (24hr)	Depth (m)	Temp (°C)	pH (SU)	Conductivity (µS/cm)	TDS (mg/L)	DO (mg/L)	Saturation (%)
10/3/2003	51-0419	12:00	0.7	14.2	7.2 c	597	388	9.2	89
10/6/2003	51-0391	11:38	0.5	13.1	7.2 c	589	383	10.5	100

Blackstone River (SARIS: 5131000) Unique ID: W0506 Station: BLK07-A

Description: Sutton Street bridge, Northbridge

Date	OWMID	Time (24hr)	Depth (m)	Temp (°C)	pH (SU)	Conductivity (µS/cm)	TDS (mg/L)	DO (mg/L)	Saturation (%)
10/3/2003	51-0369	12:19	0.8	14.3	7.3 c	598	388	10.2	100
10/6/2003	51-0392	11:24	1.6	12.9 u	7.2 c	586	381	10.4	99

Table 1 (continued). 2003 MA DEP Blackstone Sewage Bypass Response *in-situ* multiprobe Data.

Blackstone River (SARIS: 5131000) Unique ID: W1244 Station: Station 5

Description: Church Street, Northbridge

Date	OWMID	Time (24hr)	Depth (m)	Temp (°C)	pH (SU)	Conductivity (µS/cm)	TDS (mg/L)	DO (mg/L)	Saturation (%)
10/3/2003	51-0370	12:45	0.2	14.5	7.0 c	592	385	7.9	77
10/6/2003	51-0393	11:07	0.1 i	12.6	7.0 c	575	374	8.2	77

Blackstone River (SARIS: 5131000) Unique ID: W1245 Station: Station 6

Description: approximately 160 feet downstream/south of Hartford Avenue East, Uxbridge

Date	OWMID	Time (24hr)	Depth (m)	Temp (°C)	pH (SU)	Conductivity (µS/cm)	TDS (mg/L)	DO (mg/L)	Saturation (%)
10/3/2003	51-0371	13:11	1.1	15.0	7.2 c	587	382	9.7	96
10/6/2003	51-0394	10:47	0.4	12.1	7.1 c	580	377	9.8	92

Blackstone River (SARIS: 5131000) Unique ID: W1246 Station: Station 7

Description: Route 16 (Mendon Street), Uxbridge

Date	OWMID	Time (24hr)	Depth (m)	Temp (°C)	pH (SU)	Conductivity (µS/cm)	TDS (mg/L)	DO (mg/L)	Saturation (%)
10/6/2003	51-0395	10:27	2.1	11.3	7.0 c	580	377	9.7	89

Blackstone River (SARIS: 5131000) Unique ID: W1247 Station: Station 8

Description: approximately 16 feet upstream/north of "Tupperware Dam" (west of Staples Lane), Blackstone

Date	OWMID	Time (24hr)	Depth (m)	Temp (°C)	pH (SU)	Conductivity (µS/cm)	TDS (mg/L)	DO (mg/L)	Saturation (%)
10/3/2003	51-0372	13:53	0.5	14.0	7.1 c	472	307	8.9	87
10/6/2003	51-0396	10:03	0.5	11.8	6.9 u,c	494	321	9.3	86

" c " = Greater than calibration standard used for pre-calibration, or outside the acceptable range about the calibration standard (see Appendix 2 for acceptance criteria).

" i " = Inaccurate readings from multiprobe likely

" u " = Unstable readings, due to lack of sufficient equilibration time prior to final readings, non-representative location, highly-variable water quality conditions, etc

Table 2. 2003 MA DEP Blackstone Sewage Bypass Response Instream TSS and Bacteria Data.
 OWMID (sample ID), Fecal coliform, E. coli, and Total Suspended Solids (TSS)

Blackstone River (SARIS: 5131000) Unique ID: W0505 Station: BLK02

Description: McCracken Road (at the old bridge site which became a butler bridge in the early 2000s), Millbury (approximately 2300 feet downstream of Upper Blackstone WWTP (MA0102369) discharge)

Date	OWMID	QAQC	Time (24hr)	Fecal CFU/100ml	E. coli CFU/100ml	TSS mg/L
10/3/2003	51-0376	--	10:45	8600	3300	5.0
10/6/2003	51-0398	--	11:55	210	210	3.6

Blackstone River (SARIS: 5131000) Unique ID: W1240 Station: Station 1

Description: approximately 60 feet upstream/north of Upper Blackstone WWTP (MA0102369) effluent channel confluence, Millbury

Date	OWMID	QAQC	Time (24hr)	Fecal CFU/100ml	E. coli CFU/100ml	TSS mg/L
10/3/2003	51-0375	--	10:30	1000	500	1.7
10/6/2003	51-0397	--	12:00	780	730	1.5

Blackstone River (SARIS: 5131000) Unique ID: W1241 Station: Station 2

Description: Blackstone River Canal, Pleasant Street, Grafton

Date	OWMID	QAQC	Time (24hr)	Fecal CFU/100ml	E. coli CFU/100ml	TSS mg/L
10/3/2003	51-0377	--	11:12	300000	260000	8.5
10/6/2003	51-0399	--	11:30	160 e	210 e	1.3

Blackstone River (SARIS: 5131000) Unique ID: W1242 Station: Station 3

Description: Route 122A (below Fisherville Pond), Grafton

Date	OWMID	QAQC	Time (24hr)	Fecal CFU/100ml	E. coli CFU/100ml	TSS mg/L
10/3/2003	51-0378	--	11:35	390000	300000	8.5
10/6/2003	51-0400	--	11:15	170 e	190 e	2.7

Blackstone River (SARIS: 5131000) Unique ID: W1243 Station: Station 4

Description: Depot Street, Grafton

Date	OWMID	QAQC	Time (24hr)	Fecal CFU/100ml	E. coli CFU/100ml	TSS mg/L
10/3/2003	51-0379	51-0380	11:54	260000 e	300000 e	7.2
10/3/2003	51-0380	51-0379	11:54	320000 e	340000 e	7.1
10/6/2003	51-0401	51-0402	11:10	420	180	3.1
10/6/2003	51-0402	51-0401	11:10	280 e	300 e	2.8

Blackstone River (SARIS: 5131000) Unique ID: W0506 Station: BLK07-A

Description: Sutton Street bridge, Northbridge

Date	OWMID	QAQC	Time (24hr)	Fecal CFU/100ml	E. coli CFU/100ml	TSS mg/L
10/3/2003	51-0382	--	12:14	6800 e	7800 e	4.3
10/6/2003	51-0404	--	11:00	21000	17000	2.9

Blackstone River (SARIS: 5131000) Unique ID: W1244 Station: Station 5

Description: Church Street, Northbridge

Date	OWMID	QAQC	Time (24hr)	Fecal CFU/100ml	E. coli CFU/100ml	TSS mg/L
10/3/2003	51-0383	--	12:40	340	240	5.9
10/6/2003	51-0405	--	10:45	21000	18000	6.1

Blackstone River (SARIS: 5131000) Unique ID: W1245 Station: Station 6

Description: approximately 160 feet downstream/south of Hartford Avenue East, Uxbridge

Date	OWMID	QAQC	Time (24hr)	Fecal CFU/100ml	E. coli CFU/100ml	TSS mg/L
10/3/2003	51-0384	--	13:05	270	190	8.3
10/6/2003	51-0406	--	10:30	4600	3800	5.3

Table 2 (continued). 2003 MA DEP Blackstone Sewage Bypass Response Instream TSS and Bacteria Data.

Blackstone River (SARIS: 5131000) Unique ID: W1246 Station: Station 7

Description: Route 16 (Mendon Street), Uxbridge

Date	OWMID	QAQC	Time (24hr)	Fecal CFU/100ml	<i>E. coli</i> CFU/100ml	TSS mg/L
10/6/2003	51-0408	--	10:15	3800	3000	5.9

Blackstone River (SARIS: 5131000) Unique ID: W1247 Station: Station 8

Description: approximately 16 feet upstream/north of "Tupperware Dam" (west of Staples Lane), Blackstone

Date	OWMID	QAQC	Time (24hr)	Fecal CFU/100ml	<i>E. coli</i> CFU/100ml	TSS mg/L
10/3/2003	51-0385	--	13:45	100	38	4.7
10/6/2003	51-0407	--	10:00	4400	2700	4.2

"--" = No data (i.e., data not taken/not required)

"e" = Not theoretically possible. Specifically, used for bacteria data where colonies per unit volume for e-coli bacteria > fecal coliform bacteria and for other incongruous or conflicting results

Quality Control Data

Blackstone River Watershed quality control data for trip blanks and field duplicate samples can be found in Tables 3 and 4. Data qualifiers are presented at the bottom of each table and in Appendix 3. Additional information pertaining to the data validation process is provided in Appendix 2.

Table 3. 2003 MA DEP Blackstone Sewage Bypass Response Quality Control Data-Blanks.
OWMID (sample ID), Fecal coliform, E. coli, and Total Suspended Solids (TSS)

Date	OWMID	QAQC	Time (24hr)	Fecal CFU/100ml	E. coli CFU/100ml	TSS mg/L
10/3/2003	51-0381	Blank	**	<6	<6	<1.0
10/6/2003	51-0403	Blank	**	<9	<9	<1.0

"**" = Missing data (i.e., data that should have been reported)

Table 4. 2003 MA DEP Blackstone Sewage Bypass Response Quality Control Data-Duplicates.
OWMID (sample ID), Fecal coliform, E. coli, Ammonia Nitrogen (NH3-N), Total Phosphorus (TP), and Total Suspended Solids (TSS)

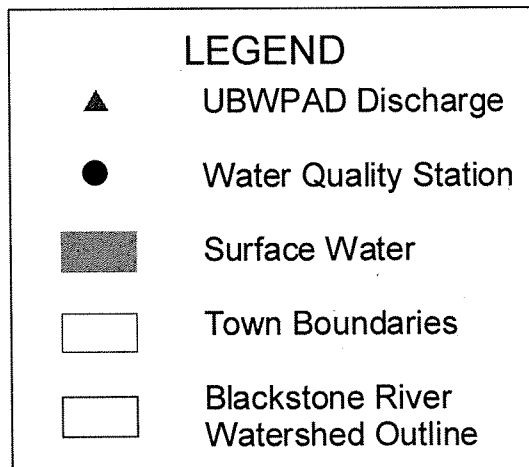
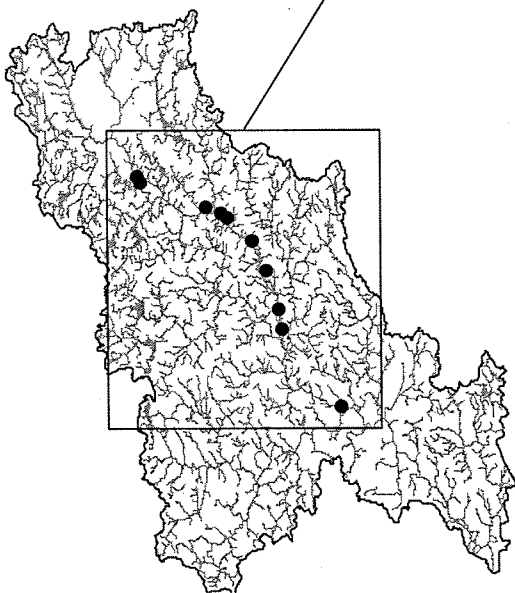
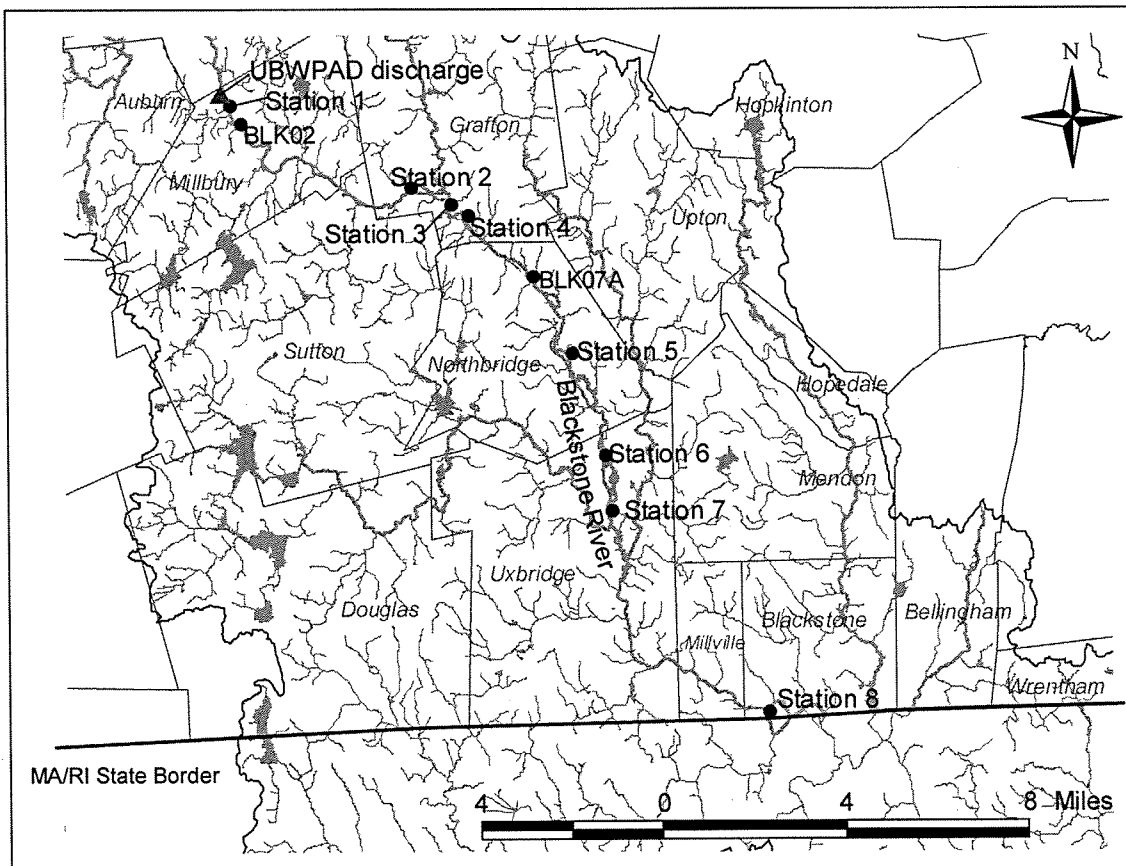
Blackstone River (SARIS: 5131000) Unique ID: W1243 Station: Station 4

Description: Depot Street, Grafton

Date	OWMID	QAQC	Time (24hr)	Log10(Fecal) CFU/100ml	Log10(E. coli) CFU/100ml	TSS mg/L
10/3/2003	51-0379	51-0380	11:54	5.415	5.477	7.2
10/3/2003	51-0380	51-0379	11:54	5.505	5.531	7.1
<i>Relative</i>	<i>Percent</i>	<i>Difference</i>	--	1.7%	1.0%	1.4%
10/6/2003	51-0401	51-0402	11:10	2.623	2.255	3.1
10/6/2003	51-0402	51-0401	11:10	2.447	2.477	2.8
<i>Relative</i>	<i>Percent</i>	<i>Difference</i>	--	6.9%	9.4%	10.2%

"--" = No data (i.e., data not taken/not required)

Figure 1. 2003 MA DEP Blackstone Sewage Bypass Response Water Quality Monitoring Station Locations.



Appendix 2

Quality Assurance/Quality Control Data Validation for the Blackstone Watershed 2003 Water Quality Survey

Selected Excerpts from:
Data Validation Report for Year 2003 Project Data (CN 211.0)

5.0 2003 Discrete Water Sample Data

5.1 QA/QC Objectives and Criteria for 2003 Discrete Water Sample Data

The collection and analysis of discrete water samples in 2003 followed the DWM Standard Operating Procedures and lab analyte-specific SOPs. The majority of river samples were taken via the manual grab and basket sampler techniques (where ambient water enters the sample bottle directly). For Lakes, the majority of samples were taken using the Van Dorn thief-type sampler and manually.

For river sampling, field quality control samples consisted of approx. 10% ambient blanks and 10% field duplicates (i.e., separate, co-located (side-by-side), simultaneous field duplicates). For lakes, equipment blanks and sequential duplicates were taken using a Van Dorn apparatus.

Using the following criteria, as well as other considerations and input from data reviewers, individual datum were either:

- Accepted
- Accepted with qualification, or
- Censored

In cases where poor quality control (e.g., blank/cross contamination, lab accuracy) affected batched analyses or entire surveys, censoring/qualification decisions were applied to groups of samples (e.g., a specific crew's samples, a specific survey's samples or all samples from a specific batch analysis).

Criteria for acceptance of discrete water quality sample data were as follows:

- For simplicity, samples that were "lost", "missing", "spilled" and "not analyzed" were denoted using the 'm' (method not followed) qualifier and ** symbol.

- **Sampling/Analysis Holding Time:** Each analyte has a standard holding time that has been established to ensure sample/analysis integrity. Refer to DWM Standard Operating Procedure CN# 1.2 for a complete listing. If the standard holding time was exceeded, this criterion is violated and the data may be censored, depending on the extent of exceedance. For minor exceedances (e.g., < than 20% of the holding time), the data is typically qualified ("h" for minor holding time violation).

- **Quality Control Sample Frequency:** At a minimum, one field blank and one replicate must be collected for every ten samples by any given sampling crew on any given date. If less than 10% blanks and replicates were collected, the data are typically qualified with "f". If blanks were omitted and duplicates taken, typically no data are qualified, as long as there are no documented historical problems for the survey-specific samplers or station locations with regard to field contamination. If blanks were taken but duplicates were not, the data may be qualified with "f". Typically, no censoring of data takes place for insufficient QC sample frequencies only.

- **Field Blanks:** Field blanks were prepared at the DWM Worcester Laboratory. Reagent grade water was transported into the field in a sample container where it was transferred into a different sample container directly or via a sampling device (equipment blank) using the same methods as for its corresponding field sample (e.g., blank samples were preserved in the same way). All blanks were submitted to the WES laboratory "blind". If the field blank results were greater than the MDL (indicating potential sampling error, airborne contaminants, dirty equipment, etc.), the data may be censored or qualified, depending on extent and other factors.

- **Field Replicates:** In 2003, field duplicate samples for rivers were taken as co-located, simultaneous duplicates. As a result, these duplicate results include any spatial, natural variability present between side-by-side samples (which should be minimal in most cases where site selection has accounted for uniform mixing). Duplicate lake samples were sequential and therefore also include any temporal variability. Samples were submitted to WES laboratory "blind". Results were compared to specific criteria contained in a 2003 QAPP document. If the criteria are not met, the sample/duplicate data may be censored or qualified, depending on extent of exceedance and other factors. Arguably, very poor precision of field duplicate samples reflects poor reproducibility for entire surveys and/or analytical batch runs, and should result in censoring or qualification of the entire survey/batch data. Decisions related to poor precision for entire surveys/batches were made on a case-by-case basis.

- **Results of Field and/or Lab Audits and Miscellaneous Survey Information:** If, based on the results of field evaluation of implementation of field sampling SOPs, samples are deemed to have been taken incorrectly or to not represent station conditions at the time of sampling, then individual or survey-based sample results may be qualified or censored. Likewise, the results of QC audits of lab(s) analytical accuracy (and precision) for specific parameters are evaluated. If results indicate poor accuracy or repeatability, batch run data may be qualified or censored. In addition, information from survey personnel regarding sample integrity and representativeness may lead to decisions to qualify or censor data.

- **Laboratory assessment of analytical precision and accuracy:** The WES Laboratory is solely responsible for the administration of its Quality Assurance Program and Standard Operating Procedures. WES staff release discrete water sample data when their established QA/QC criteria have been met. When the following criteria cannot be met, data are qualified using appropriate qualifiers:

Low Calibration Standards – Checks the stability of the instrument's calibration curve; analyzes the *accuracy* of an instrument's calibration within a 5% range.

Reference Standards – Generally, a second source standard (a standard different from the calibration stock standard) that analyzes the method *accuracy*.

Laboratory Reagent Blank/Method Blank (LRB) – Reagent grade water (de-ionized) extracted with every sample set used to ensure that the system is free of target analytes (< MDL) and to assess potential blank contamination.

Duplicate Sample – Measures the *precision* (as Relative Percent Difference or RPD) of the analytical process. The acceptable laboratory %RPD range is typically $\leq 25\%$. For bacteria, duplicate data are evaluated based the range of logged values.

Spike Sample (Laboratory Fortified Blank - LFB, Laboratory Fortified Matrix - LFM)– Measures the *accuracy* (% Recovery) of an analytical method. The acceptable laboratory % recovery range is typically between 80 – 120% for LFB samples and 70 –130% for LFM discrete water samples.

Field Audits – In 2003, three field audits (total) were performed by DWM's QC Analyst. These audits involved six different DWM staff members, and were useful in stressing:

- Attention to required field safety precautions, including driving safety
- Proper care of multi-probe units
- Survey preparation so that needed field equipment is not forgotten
- Importance of filling out fieldsheets completely, and
- Need to depth-calibrate the multi-probe initially at the first station

All audits concluded that staff performance was good-excellent in terms of SOP adherence. Audit results did not impact validation of survey sample results.

Lab Audits – To provide external evaluation of lab performance with regard to sample analyses for specific analytes, the following lab audits were performed in 2003:

5.3 QA/QC Issues and Considerations for 2003 Data

The following are particularly noteworthy regarding 2003 DWM/CERO surveys. The validation decisions contained in the tables below reflect these considerations.

Blackstone Sewage Spill Project. Equipment failure at the Upper Blackstone Wastewater Treatment Plant resulted in a sewage (treated and untreated) spill into the Blackstone River on 10/2/03. Bacteria and TSS samples were taken 10/2, 10/3, 10/6 and 10/8. Based on the need to have final data quickly, data validation for these samples was expedited. This review is summarized in Appendix C. All bacteria samples from 10/2, 10/3 and 10/6 were accepted, except one sample (BLK 02 on 10/2) that was qualified due to the potential effect of chlorine (no dechlorination of sample). All data from 10/8 was not accepted, due to lack of field documentation.

Station Representativeness. For this data validation effort, all station locations were assumed to have been located to be representative of river/stream and lake/pond conditions at the sampling time. This assumption is applied to both historic station locations, as well as new sampling stations.

Frequency and Type of Field QC Samples (ambient field blanks and field duplicates/splits). DWM field sheet data were reviewed with respect to meeting the minimum frequency of survey QC samples (ambient field blanks and field duplicates/splits). Unless otherwise indicated in Sections 5, 6 and 7, all reported data from WES (and DWM for color and chl a) met the required minimum frequency of approx. 10% of the total sample number (and a minimum of one blank/analyte/survey and one duplicate/split per analyte per survey). In 2003, field duplicates were typically taken as co-located, simultaneous replicates.

High NH₃-N in ambient field blanks. On more than one occasion, elevated levels of NH₃-N were detected in ambient field blanks. The cause(s) for this could not be traced to the quality of DWM deionized water, WES/STL lab contamination, field effects (e.g., precipitation), or crew effects (high blanks observed for multiple crews). While the cause remains unknown, all survey data related to high NH₃-N in ambient field blanks have been qualified.

WES Lab TSS Data. Lack of adherence to the WES lab SOP for TSS analysis resulted in WES' qualification of TSS data from 5 batches. These decisions have been carried through to the final DWM data.

WES Lab DRP Data. Field-filtered samples for dissolved reactive P analysis, part of a DWM QC study comparing P recovery from field vs. lab filtered samples, were lost by WES. These samples have been categorized by DWM as "missing" (**).

5.4 2003 Censored/Qualified Discrete Water Sample Data (Blackstone River Watershed)

All Year 2003 data for discrete water samples that have been censored or qualified are listed below by project, except for missing data (Table 1). For qualifier definitions see Appendix 2.

Table 1. 2003 Censored/Qualified Discrete Water Sample Data (Blackstone River Watershed)

PROJECT	ANALYTE	DATE	OWMID	LAB ID	RESULT	QUALIFIER	UNITS
Blackstone Sewage Bypass (2003)	Fecal Coliforms	10/3/2003	51-0379	2003195-005	260000	e	CFU/100mL
Blackstone Sewage Bypass (2003)	Fecal Coliforms	10/3/2003	51-0380	2003195-006	320000	e	CFU/100mL
Blackstone Sewage Bypass (2003)	Fecal Coliforms	10/3/2003	51-0382	2003195-008	6800	e	CFU/100mL
Blackstone Sewage Bypass (2003)	Fecal Coliforms	10/6/2003	51-0399	2003197-003	160	e	CFU/100mL
Blackstone Sewage Bypass (2003)	Fecal Coliforms	10/6/2003	51-0400	2003197-004	170	e	CFU/100mL
Blackstone Sewage Bypass (2003)	Fecal Coliforms	10/6/2003	51-0402	2003197-006	280	e	CFU/100mL
Blackstone Sewage Bypass (2003)	E. Coli - Modified m-TEC	10/3/2003	51-0379	2003195-005	300000	e	CFU/100mL
Blackstone Sewage Bypass (2003)	E. Coli - Modified m-TEC	10/3/2003	51-0380	2003195-006	340000	e	CFU/100mL
Blackstone Sewage Bypass (2003)	E. Coli - Modified m-TEC	10/3/2003	51-0382	2003195-008	7800	e	CFU/100mL
Blackstone Sewage Bypass (2003)	E. Coli - Modified m-TEC	10/6/2003	51-0399	2003197-003	210	e	CFU/100mL
Blackstone Sewage Bypass (2003)	E. Coli - Modified m-TEC	10/6/2003	51-0400	2003197-004	190	e	CFU/100mL
Blackstone Sewage Bypass (2003)	E. Coli - Modified m-TEC	10/6/2003	51-0402	2003197-006	300	e	CFU/100mL
Blackstone, (2003)	Fecal Coliforms	4/23/2003	51-0112	2003043-003	26	e	CFU/100mL
Blackstone, (2003)	Fecal Coliforms	4/23/2003	51-0114	2003043-005	280	e	CFU/100mL
Blackstone, (2003)	Fecal Coliforms	4/23/2003	51-0116	2003043-007	97	e	CFU/100mL
Blackstone, (2003)	Fecal Coliforms	4/23/2003	51-0131	2003043-023	58	e	CFU/100mL
Blackstone, (2003)	Fecal Coliforms	5/21/2003	51-0142	2003062-006	260	e	CFU/100mL
Blackstone, (2003)	Fecal Coliforms	5/21/2003	51-0144	2003062-007	390	e	CFU/100mL
Blackstone, (2003)	Fecal Coliforms	5/21/2003	51-0150	2003062-010	39	ef	CFU/100mL
Blackstone, (2003)	Fecal Coliforms	5/21/2003	51-0152	2003062-014	110	f	CFU/100mL
Blackstone, (2003)	Fecal Coliforms	5/21/2003	51-0153	2003062-011	52	f	CFU/100mL
Blackstone, (2003)	Fecal Coliforms	5/21/2003	51-0155	2003062-012	19	ef	CFU/100mL
Blackstone, (2003)	Fecal Coliforms	5/21/2003	51-0157	2003062-013	##	fj	CFU/100mL
Blackstone, (2003)	Fecal Coliforms	5/21/2003	51-0166	2003062-017	39	e	CFU/100mL
Blackstone, (2003)	Fecal Coliforms	5/21/2003	51-0172	2003062-021	20	e	CFU/100mL
Blackstone, (2003)	Fecal Coliforms	7/23/2003	51-0232	2003123-023	600	e	CFU/100mL
Blackstone, (2003)	Fecal Coliforms	7/23/2003	51-0234	2003123-001	3400	e	CFU/100mL
Blackstone, (2003)	Fecal Coliforms	7/23/2003	51-0236	2003123-003	210	e	CFU/100mL
Blackstone, (2003)	Fecal Coliforms	7/23/2003	51-0237	2003123-004	370	e	CFU/100mL
Blackstone, (2003)	Fecal Coliforms	8/28/2003	51-0431	2003167-002	13	e	CFU/100mL
Blackstone, (2003)	Fecal Coliforms	10/2/2003	51-0320	2003192-013	<6	e	CFU/100mL
Blackstone, (2003)	Fecal Coliforms	10/2/2003	51-0322	2003192-014	13	e	CFU/100mL
Blackstone, (2003)	Fecal Coliforms	10/2/2003	51-0327	2003192-018	140	e	CFU/100mL
Blackstone, (2003)	Fecal Coliforms	10/2/2003	51-0332	2003192-020	210	am	CFU/100mL
Blackstone, (2003)	Fecal Coliforms	10/2/2003	51-0344	2003192-002	26	e	CFU/100mL
Blackstone, (2003)	Fecal Coliforms	10/2/2003	51-0346	2003192-003	13	e	CFU/100mL
Blackstone, (2003)	Fecal Coliforms	10/2/2003	51-0348	2003192-004	40	e	CFU/100mL
Blackstone, (2003)	Fecal Coliforms	10/2/2003	51-0351	2003192-007	65	e	CFU/100mL
Blackstone, (2003)	Fecal Coliforms	10/2/2003	51-0358	2003192-010	32	e	CFU/100mL
Blackstone, (2003)	E. Coli - Modified m-TEC	8/28/2003	51-0431	2003167-002	32	e	CFU/100mL
Blackstone, (2003)	E. Coli - Modified m-TEC	10/2/2003	51-0320	2003192-013	6	e	CFU/100mL
Blackstone, (2003)	E. Coli - Modified m-TEC	10/2/2003	51-0322	2003192-014	39	e	CFU/100mL
Blackstone, (2003)	E. Coli - Modified m-TEC	10/2/2003	51-0327	2003192-018	180	e	CFU/100mL
Blackstone, (2003)	E. Coli - Modified m-TEC	10/2/2003	51-0332	2003192-020	90	am	CFU/100mL
Blackstone, (2003)	E. Coli - Modified m-TEC	10/2/2003	51-0344	2003192-002	39	e	CFU/100mL

Table 1 (continued). 2003 Censored/Qualified Discrete Water Sample Data (Blackstone River Watershed)

PROJECT	ANALYTE	DATE	OWMID	LAB ID	RESULT	QUALIFIER	UNITS
Blackstone, (2003)	E. Coli - Modified m-TEC	10/2/2003	51-0346	2003192-003	19	e	CFU/100mL
Blackstone, (2003)	E. Coli - Modified m-TEC	10/2/2003	51-0348	2003192-004	60	e	CFU/100mL
Blackstone, (2003)	E. Coli - Modified m-TEC	10/2/2003	51-0351	2003192-007	71	e	CFU/100mL
Blackstone, (2003)	E. Coli - Modified m-TEC	10/2/2003	51-0358	2003192-010	52	e	CFU/100mL
Blackstone, (2003)	E. coli - MF	4/23/2003	51-0112	2003043-003	32	e	CFU/100mL
Blackstone, (2003)	E. coli - MF	4/23/2003	51-0114	2003043-005	310	e	CFU/100mL
Blackstone, (2003)	E. coli - MF	4/23/2003	51-0116	2003043-007	100	e	CFU/100mL
Blackstone, (2003)	E. coli - MF	4/23/2003	51-0131	2003043-023	120	e	CFU/100mL
Blackstone, (2003)	E. coli - MF	5/21/2003	51-0142	2003062-006	290	e	CFU/100mL
Blackstone, (2003)	E. coli - MF	5/21/2003	51-0144	2003062-007	440	e	CFU/100mL
Blackstone, (2003)	E. coli - MF	5/21/2003	51-0150	2003062-010	45	ef	CFU/100mL
Blackstone, (2003)	E. coli - MF	5/21/2003	51-0152	2003062-014	110	f	CFU/100mL
Blackstone, (2003)	E. coli - MF	5/21/2003	51-0153	2003062-011	39	f	CFU/100mL
Blackstone, (2003)	E. coli - MF	5/21/2003	51-0155	2003062-012	26	ef	CFU/100mL
Blackstone, (2003)	E. coli - MF	5/21/2003	51-0157	2003062-013	##	fj	CFU/100mL
Blackstone, (2003)	E. coli - MF	5/21/2003	51-0166	2003062-017	45	e	CFU/100mL
Blackstone, (2003)	E. coli - MF	5/21/2003	51-0172	2003062-021	47	e	CFU/100mL
Blackstone, (2003)	E. coli - MF	7/23/2003	51-0232	2003123-023	680	e	CFU/100mL
Blackstone, (2003)	E. coli - MF	7/23/2003	51-0234	2003123-001	4000	e	CFU/100mL
Blackstone, (2003)	E. coli - MF	7/23/2003	51-0236	2003123-003	240	e	CFU/100mL
Blackstone, (2003)	E. coli - MF	7/23/2003	51-0237	2003123-004	400	e	CFU/100mL
Blackstone, (2003)	Ammonia-N	5/21/2003	51-0134	2003065-001	0.26	d	mg/L
Blackstone, (2003)	Ammonia-N	5/21/2003	51-0136	2003065-002	<0.02	d	mg/L
Blackstone, (2003)	Ammonia-N	5/21/2003	51-0138	2003065-003	<0.02	d	mg/L
Blackstone, (2003)	Ammonia-N	5/21/2003	51-0140	2003065-004	##	d	mg/L
Blackstone, (2003)	Ammonia-N	5/21/2003	51-0142	2003065-006	##	d	mg/L
Blackstone, (2003)	Ammonia-N	5/21/2003	51-0144	2003065-007	<0.06	d	mg/L
Blackstone, (2003)	Ammonia-N	5/21/2003	51-0146	2003065-008	4.8	d	mg/L
Blackstone, (2003)	Ammonia-N	5/21/2003	51-0148	2003065-009	4.2	d	mg/L
Blackstone, (2003)	Ammonia-N	5/21/2003	51-0150	2003065-010	<0.06	f	mg/L
Blackstone, (2003)	Ammonia-N	5/21/2003	51-0153	2003065-011	<0.06	f	mg/L
Blackstone, (2003)	Ammonia-N	5/21/2003	51-0155	2003065-012	<0.02	f	mg/L
Blackstone, (2003)	Ammonia-N	5/21/2003	51-0157	2003065-013	<0.06	f	mg/L
Blackstone, (2003)	Ammonia-N	5/21/2003	51-0164	2003065-015	<0.06	d	mg/L
Blackstone, (2003)	Ammonia-N	5/21/2003	51-0166	2003065-016	0.29	d	mg/L
Blackstone, (2003)	Ammonia-N	5/21/2003	51-0168	2003065-017	0.16	d	mg/L
Blackstone, (2003)	Ammonia-N	5/21/2003	51-0170	2003065-018	##	d	mg/L
Blackstone, (2003)	Ammonia-N	5/21/2003	51-0172	2003065-020	##	d	mg/L
Blackstone, (2003)	Ammonia-N	5/21/2003	51-0174	2003065-021	<0.06	d	mg/L
Blackstone, (2003)	Ammonia-N	5/21/2003	51-0176	2003065-014	0.06	d	mg/L
Blackstone, (2003)	Total Phosphorus	5/21/2003	51-0150	2003065-010	0.027	f	mg/L
Blackstone, (2003)	Total Phosphorus	5/21/2003	51-0153	2003065-011	0.028	f	mg/L
Blackstone, (2003)	Total Phosphorus	5/21/2003	51-0155	2003065-012	0.014	f	mg/L
Blackstone, (2003)	Total Phosphorus	5/21/2003	51-0157	2003065-013	0.20	f	mg/L
Blackstone, (2003)	Total Phosphorus	6/25/2003	51-0195	2003093-042	<0.005	h	mg/L

Table 1 (continued). 2003 Censored/Qualified Discrete Water Sample Data (Blackstone River Watershed)

PROJECT	ANALYTE	DATE	OWMID	LAB ID	RESULT	QUALIFIER	UNITS
Blackstone, (2003)	Total Phosphorus	8/27/2003	51-0266	2003166-025	0.047	d	mg/L
Blackstone, (2003)	Total Phosphorus	8/27/2003	51-0267	2003166-026	0.009	d	mg/L
Blackstone, (2003)	Total Phosphorus	8/27/2003	51-0268	2003166-027	0.064	d	mg/L
Blackstone, (2003)	Total Phosphorus	8/27/2003	51-0269	2003166-028	##	d	mg/L
Blackstone, (2003)	Total Phosphorus	8/27/2003	51-0271	2003166-029	##	d	mg/L
Blackstone, (2003)	Total Phosphorus	8/27/2003	51-0272	2003166-031	0.041	d	mg/L
Blackstone, (2003)	Total Phosphorus	8/27/2003	51-0273	2003166-032	0.46	d	mg/L
Blackstone, (2003)	Total Phosphorus	8/27/2003	51-0274	2003166-033	0.50	d	mg/L
Blackstone, (2003)	Total Phosphorus	8/27/2003	51-0275	2003166-034	0.017	d	mg/L
Blackstone, (2003)	Total Phosphorus	8/27/2003	51-0276	2003166-035	0.36	d	mg/L
Blackstone, (2003)	Total Phosphorus	8/27/2003	51-0277	2003166-036	0.034	d	mg/L
Blackstone, (2003)	Total Phosphorus	10/2/2003	51-0332	2003193-008	##	h	mg/L
Blackstone, (2003)	Total Phosphorus	10/2/2003	51-0334	2003193-009	##	h	mg/L
Blackstone, (2003)	Total Suspended Solids	5/21/2003	51-0150	2003065-031	2.5	f	mg/L
Blackstone, (2003)	Total Suspended Solids	5/21/2003	51-0153	2003065-032	2.8	f	mg/L
Blackstone, (2003)	Total Suspended Solids	5/21/2003	51-0155	2003065-033	<1.0	f	mg/L
Blackstone, (2003)	Total Suspended Solids	5/21/2003	51-0157	2003065-034	2.6	f	mg/L
Blackstone, (2003)	Total Suspended Solids	6/25/2003	51-0178	2003093-001	1.6	j	mg/L
Blackstone, (2003)	Total Suspended Solids	6/25/2003	51-0179	2003093-002	3.0	j	mg/L
Blackstone, (2003)	Total Suspended Solids	6/25/2003	51-0180	2003093-003	2.4	j	mg/L
Blackstone, (2003)	Total Suspended Solids	6/25/2003	51-0181	2003093-004	3.2	j	mg/L
Blackstone, (2003)	Total Suspended Solids	6/25/2003	51-0182	2003093-005	<1.0	j	mg/L
Blackstone, (2003)	Total Suspended Solids	6/25/2003	51-0183	2003093-006	3.4	j	mg/L
Blackstone, (2003)	Total Suspended Solids	6/25/2003	51-0184	2003093-007	7.7	j	mg/L
Blackstone, (2003)	Total Suspended Solids	6/25/2003	51-0185	2003093-008	6.8	j	mg/L
Blackstone, (2003)	Total Suspended Solids	6/25/2003	51-0186	2003093-009	5.7	j	mg/L
Blackstone, (2003)	Total Suspended Solids	6/25/2003	51-0187	2003093-010	1.9	j	mg/L
Blackstone, (2003)	Total Suspended Solids	6/25/2003	51-0188	2003093-011	8.3	j	mg/L
Blackstone, (2003)	Total Suspended Solids	6/25/2003	51-0189	2003093-012	2.3	j	mg/L
Blackstone, (2003)	Total Suspended Solids	6/25/2003	51-0190	2003093-013	1.5	j	mg/L
Blackstone, (2003)	Total Suspended Solids	6/25/2003	51-0191	2003093-014	3.9	j	mg/L
Blackstone, (2003)	Total Suspended Solids	6/25/2003	51-0192	2003093-015	<1.0	j	mg/L
Blackstone, (2003)	Total Suspended Solids	6/25/2003	51-0193	2003093-016	2.2	j	mg/L
Blackstone, (2003)	Total Suspended Solids	6/25/2003	51-0194	2003093-017	1.7	j	mg/L
Blackstone, (2003)	Total Suspended Solids	6/25/2003	51-0195	2003093-018	<1.0	j	mg/L
Blackstone, (2003)	Total Suspended Solids	6/25/2003	51-0196	2003093-019	1.6	j	mg/L
Blackstone, (2003)	Total Suspended Solids	6/25/2003	51-0197	2003093-020	5.4	j	mg/L
Blackstone, (2003)	Total Suspended Solids	6/25/2003	51-0198	2003093-021	7.6	j	mg/L
Blackstone, (2003)	Total Suspended Solids	6/25/2003	51-0199	2003093-022	3.3	j	mg/L
Blackstone, (2003)	Total Suspended Solids	6/25/2003	51-0200	2003093-023	2.4	j	mg/L
Blackstone, (2003)	Total Suspended Solids	6/25/2003	51-0201	2003093-024	1.8	j	mg/L
Blackstone, (2003)	Total Suspended Solids	7/23/2003	51-0234	2003125-013	2.5	d	mg/L
Blackstone, (2003)	Total Suspended Solids	7/23/2003	51-0235	2003125-014	3.4	d	mg/L
Blackstone, (2003)	Total Suspended Solids	7/23/2003	51-0236	2003125-015	1.3	d	mg/L
Blackstone, (2003)	Total Suspended Solids	7/23/2003	51-0237	2003125-016	4.1	d	mg/L

Table 1 (continued). 2003 Censored/Qualified Discrete Water Sample Data (Blackstone River Watershed)

PROJECT	ANALYTE	DATE	OWMID	LAB ID	RESULT	QUALIFIER	UNITS
Blackstone, (2003)	Total Suspended Solids	7/23/2003	51-0238	2003125-017	2.5	d	mg/L
Blackstone, (2003)	Total Suspended Solids	7/23/2003	51-0240	2003125-019	<1.0	d	mg/L
Blackstone, (2003)	Total Suspended Solids	7/23/2003	51-0241	2003125-020	33	d	mg/L
Blackstone, (2003)	Total Suspended Solids	7/23/2003	51-0242	2003125-021	20	d	mg/L
Blackstone, (2003)	Total Suspended Solids	7/23/2003	51-0243	2003125-022	21	d	mg/L
Blackstone, (2003)	Total Suspended Solids	7/23/2003	51-0244	2003125-023	59	d	mg/L
Blackstone, (2003)	Total Suspended Solids	7/23/2003	51-0245	2003125-024	7.4	d	mg/L

Appendix 3

Selected Excerpts from: Data Validation Report for Year 2003 Project Data (CN 211.0)

Department of Environmental Protection
Division of Watershed Management

The following data qualifiers or symbols are used in the MADEP/DWM WQD database for qualified and censored water quality data. Decisions regarding censoring vs. qualification for specific, problematic data are made based on a thorough review of all pertinent information related to the data, including the magnitude or extent of the problem(s).

General Symbols (applicable to all types):

<MDL	Result is less than the Method Detection Limit
<RDL	Result is less than Reporting Detection Limit
>UQL	Result is greater than Upper Quantification Limit
**	Missing result for administrative reason – i.e. broken bottle
##	Result censored following laboratory and/or DWM QAQC criteria
*	Analysis performed by Laboratory OTHER than DEP's Wall Experiment Station (WES)

Multi-probe-specific Qualifiers:

“ i ” = inaccurate readings from multiprobe likely; may be due to significant pre-survey calibration problems, post-survey calibration readings outside typical acceptance range for the low ionic check and for the deionized blank water check, lack of calibration of the depth sensor prior to use, or to checks against laboratory analyses.

Qualification Criteria for Depth (i):

General Depth Criteria: Apply to each OWMID#

- Clearly erroneous readings due to faulty depth sensor: Censor (i)
- Negative and zero depth readings: Censor (i); (likely in error)
- 0.1 m depth readings: Qualify (i); (potentially in error)
- 0.2 and greater depth readings: Accept without qualification; (likely accurate)

Specific Depth Criteria: Apply to entirety of depth data for survey date

- If zero and/or negative depth readings occur more than once per survey date, censor all negative/zero depth data, and qualify all other depth data for that survey (indicates that erroneous depth readings were not recognized in the field and that corrective action (field calibration of the depth sensor) was not taken, i.e. that all positive readings may be in error.)

“ m ” = method not followed; one or more protocols contained in the DWM multiprobe SOP not followed, i.e. operator error (e.g. less than 3 readings per station (rivers) or per depth (lakes), or instrument failure not allowing method to be implemented).

“ s ” = field sheet recorded data were used to accept data, not data electronically recorded in the field unit, due to operator error or equipment failure.

“ u ” = unstable readings, due to lack of sufficient equilibration time prior to final readings, non-representative location, highly-variable water quality conditions, etc. See Section 4.1 for acceptance criteria.

“ c ” = greater than calibration standard used for pre-calibration, or outside the acceptable range about the calibration standard. Typically used for conductivity (>718, 1,413, 2,760, 6,668 or 12,900 uS/cm) or

turbidity (>10, 20 or 40 NTU). It can also be used for TDS and Salinity calculations based on qualified ("c") conductivity data, or that the calculation was not possible due to censored conductivity data (TDS and Salinity are calculated values and entirely based on conductivity reading). See Section 4.1 for acceptance criteria.

" ? " = Light interference on Turbidity sensor (typ. error message). Data is typically censored.

Sample-specific Qualifiers:

" **a** " = accuracy as estimated at WES Lab via matrix spikes, PT sample recoveries, internal check standards and lab-fortified blanks did not meet project data quality objectives identified for program or in QAPP.

" **b** " = blank Contamination in lab reagent blanks and/or field blank samples (indicating possible bias high and false positives).

" **d** " = precision of field **d**uplicates (as RPD) did not meet project data quality objectives identified for program or in QAPP. Batched samples may also be affected.

" **e** " = not theoretically possible. Specifically, used for bacteria data where colonies per unit volume for e-coli bacteria > fecal coliform bacteria, for lake Secchi and station depth data where a specific Secchi depth is greater than the reported station depth, and for other incongruous or conflicting results.

" **f** " = frequency of quality control duplicates did not meet data quality objectives identified for program or in QAPP.

" **h** " = holding time violation (usually indicating possible bias low)

" **j** " = used for lab-related issues where certain lab QC criteria are not met and re-testing is not possible (as identified by the WES lab only). Also used to report sample data where the sample concentration is less than the 'reporting' limit or RDL and greater than the method detection limit or MDL ($mdl < x < rdl$). Also used to note where values have been reported at levels less than the mdl. Denotes an 'estimated' value' when used as a qualifier only (i.e., not censored). When solely used for censored data, it denotes censure at the lab.

" **m** " = method SOP not followed (only partially implemented or not implemented at all) due to complications with sample matrix (e.g. sediment in sample, floc formation), lab error (eg. cross-contamination between samples), additional steps taken by the lab to deal with matrix complications, lost/unanalyzed samples, missing data or deviations from field sampling SOPs.

" **p** " = samples not **p**reserved per SOP or analytical method requirements.

" **r** " = samples collected may not be representative of actual field conditions, based on documented or suspected field sampling error, or inexplicable or improbable ("outliers") values.

Appendix 4

Excerpted from: Data Validation Report for Year 2003 Project Data (CN 211.0)

Expedited data validation results for October, 2003 sewage spill from the Upper Blackstone WWTP

Department of Environmental Protection
Division of Watershed Management

Email from R. Chase to Tom Dallaire and Art Johnson on 10/22/03 RE: Validation of BLK spill event data

These data include multi-probe field readings, fieldsheet notes, sample COC forms and WES lab reports for the 10/2, 10/3 and 10/6 surveys (except for TP, TSS and NH3 data for the 10/2 survey; and 10/3 TSS data---not yet received).

NOTE: The 10/8 survey was not included in my review, due to lack of fieldsheets and station discrepancies.

The objective of this review is to provide an expedited validation of these data, in light of the need to discuss results in a timely manner. The review was guided by our SOP for data validation (CN 56.0), our data use guidance (CN 0.8) and best professional judgement.

Based on my review and in consultation with you, Jeff Smith, Stella Kiras and others, the following is concluded with respect to the validity of the data:

- 1) As a whole, these data appear to be representative of field conditions at the time of each survey.
- 2) These data were collected by trained, experienced DWM and CERO staff following accepted DWM protocols.
- 3) All survey data appear to represent "dry weather" conditions (based on precipitation data provided by survey coordinator).
- 4) All final multi-probe data (provided to you as highlighted rows on the raw YSI printouts) are indicative of stable ambient conditions, had acceptable pre-survey calibrations and post-survey checks, are based on proper instrument use, and the electronic date/time stamps matched the fieldsheet data.
- 5) In general, fieldsheet data look OK, albeit incomplete for the 10/6 CERO run. Stella filled out fieldsheets at a later time for the 10/6 survey run by Warren and Terry (CERO), based on their field notebook notes. Therefore, some of the data we typically gather from the fieldsheets is missing for this run. Also, "Site" #s used by CERO are different from "Station" #s used by DWM, but the stations are easily matched based on good station/site descriptions.
- 6) All lab analyses by WES for these survey samples were performed within holding times, and were accurate and precise based on the lab QC data. For the 10/2 bacteria analysis, two lab duplicates slightly exceeded the acceptance criteria for range of logs but were accepted by the lab due to low number effect.

7) A field blank sample and a sample duplicate were taken for each analyte for each crew survey (taking water samples). All ambient field blanks for bacteria were less than detection limits (6 and 9 org./100 mls.). Field duplicates (not splits, but co-located, sequential, less than 1 min. apart) for all bacteria survey data indicate good overall precision (meeting our data quality objectives) for fecal and E. coli, based on the RPD of log values:

Type	ID	x1	x2	rpd	log10 x1	log10 x2	rpd (log)
fecal	401/402	280	420	40.0	2.4	2.6	6.9
fecal	379/380	260000	320000	20.7	5.4	5.5	1.7
fecal	350/351	65	71	8.8	1.8	1.9	2.1
fecal	326/327	140	150	6.9	2.1	2.2	1.4
e-coli	350/351	52	71	30.9	1.7	1.9	7.6
e-coli	326/327	77	180	80.2	1.9	2.3	17.8
e-coli	379/380	300000	340000	12.5	5.5	5.5	1.0
e-coli	401/402	180	300	50.0	2.3	2.5	9.4

NOTE: Samples 51-326/327 (10/2 survey) for E. coli showed relatively low precision at low values (RPD=17.8). This can be attributed to both low number effect and the more variable nature of episodic event samples. The overall precision of the fecal results for the same samples was good (1.4 RPDlog).

The 10/6 TSS results for the field blank and field duplicate were <1.0 mg/L and 10% RPD, respectively.

8) The COC forms indicate that all samples were accounted for at all times and were dropped off/logged in at WES properly. Although the sodium thio- preservation code was not used for all samples on the COC, I confirmed with Stella that all wade-in stations used the sodium thio- tab bottles to dechlorinate, while all the basket drop stations did not dechlorinate with sodium thio: BLK02 (10/2 only), BLK07A, BS19, Station 3, and Station 7. This is mainly relevant for the basket drop stations closest downstream of the discharge channel--- mainly BLK02 (on 10/2 only) and to a much-lesser extent Station 3 and BLK07A on all dates. The duration and volume of the un-chlorinated discharge from the UBWPAD was approx. 1.5 hrs (2:30-4:00 pm, 10/2) and about 2 MG, respectively. At all other times, the normal discharge and the primary-treated spill discharge was chlorinated. Any bias due to lack of sample dechlorination (possible for the 10/2 BLK02 data) would be negative in terms of bacteria numbers.

9) New station locations are described adequately on all fieldsheets (as revised) for creation of stations in the WQD database. Of the 13 total stations visited during the week, 5 were historical stations downstream of the UBWPAD.

10) Note that the .shp map file denoting the approx. station locations and bacteria results is accurate, except for Station 7 results: should read 3800 cfu/100 mls., not 38,000 cfu/100 mls.

In summary, I recommend that all these data from the 10/2, 10/3 and 10/6 Blackstone surveys (except for not yet received 10/2 and 10/3 data) be accepted at "QC3" status without qualification or censure, except for:

ID# 51-0332 fecal and E. coli results for BLK02 (10/2 survey): accept, but qualify with "a" and "m" (potential low bias due to lack of sample dechlorination).

At your discretion, please forward these validation results to CERO, as appropriate.

If you have questions and/or comments, let's discuss.

Thank you.

Richard