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Environmental  
Protection Agency

Division of Surface Water

# Appendices to: Biological and Water Quality Study of Salt Creek and Selected Tributaries

(Muskingum River Basin)



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# APPENDICES

## Biological and Water Quality Study of Salt Creek and Selected Tributaries (Muskingum River Basin) 2008

### TABLE OF CONTENTS

Appendix Table 1. Surface water chemical/physical results .....A1  
 Appendix Table 2. Surface water bacteriological results .....A14  
 Appendix Table 3. Surface water Datasonde<sup>®</sup> results .....A18  
 Appendix Table 4. Surface water sediment results .....A21  
 Appendix Table 5. Surface water organic chemistry results .....A25  
 Appendix Table 6. Surface water and sediment lake chemistry results .....A27  
 Appendix Table 7. Discharge Monitoring Report (DMR) data .....A34  
 Appendix Table 8. Qualitative Habitat Evaluation Index scores and attributes .....A35  
 Appendix Table 9. Fish species and abundance for each sampling location .....A36  
 Appendix Table 10. Fish IBI scores and metrics .....A59  
 Appendix Table 11. Macroinvertebrate species results .....A62  
 Appendix Table 12. Macroinvertebrate ICI scores and metrics .....A89  
 Appendix Table 13. Methods, Biosurvey Background Information, and Notice to Users .....A90

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Appendix Table 1. Salt Creek watershed chemical/physical and bacteriological water sampling results, 2008. NA = not analyzed. J = result is an estimate. RC = result is rejected due to poor correlation with its co-analyte. PT= result is estimated because sample was not analyzed within holding time.

Parameter	Units
BOD5	mg/L
Total Dissolved Solids	mg/L
Total Suspended Solids	mg/L
Arsenic	ug/L
Cadmium	ug/L
Chromium	ug/L
Copper	ug/L
Lead	ug/L
Nickel	ug/L
Selenium	ug/L
Aluminum	ug/L
Barium	ug/L
Calcium	mg/L
Hardness, Total	mg/L
Iron	ug/L
Magnesium	mg/L
Manganese	ug/L
Potassium	mg/L
Sodium	mg/L
Strontium	ug/L
Zinc	ug/L
Mercury	ug/L
Acidity	mg/L
Alkalinity	mg/L
Ammonia	mg/L
COD	mg/L
Chloride	mg/L
Conductivity	umhos/cm
Nitrate+nitrite	mg/L
Nitrite	mg/L
Sulfate	mg/L
TKN	mg/L
Total Phosphorus	mg/L
<b>Field Measurements</b>	
Temperature	°C
Conductivity	µmhos/cm
D.O. Saturation	%
Dissolved Oxygen	mg/L
pH	S.U.

Site Location: <b>SALT CREEK @ Bethel Road</b>				
River Mile: 25.7 Storet: R16G91				
6/24/2008 10:06 AM	7/8/2008 2:53 PM	7/29/2008 12:40 PM	8/14/2008 3:01 PM	9/24/2008 12:15 PM
NA	NA	NA	NA	NA
228	218	240	280	276
8	8	11	7	<5
<2.0	<2.0	<2.0	<2.0	<2.0
<0.20	<0.20	<0.20	<0.20	<0.20
<2.0	<2.0	<2.0	<2.0	<2.0
<2.0	<2.0	<2.0	<2.0	<2.0
<2.0	<2.0	<2.0	<2.0	<2.0
<2.0	<2.0	<2.0	<2.0	<2.0
<2.0	<2.0	2.1	<2.0	2.3
<2.0	<2.0	<2.0	<2.0	<2.0
269	267	<200	<200	<200
37	34	41	44	60
47	43	53	55	63
159	144	178	187	219
643	507	464	387	443
10	9	11	12	15
67	46	64	62	206
3	3	3	4	8
8	7	8	10	12
150	127	160	186	234
<10	<10	<10	<10	<10
<0.20	<0.20	<0.20	<0.20	<0.20
<5.0	<5.0	<5.0	<5.0	<5.0
109	100	145	156	160
<0.050	<0.050	<0.050	<0.050	<0.050
42	<10	<10	17	11
17.5	13.3	19.6	22.3	30.0
342	309	383	406	480
1.41	1.77	1.41	1.10	<0.10
0.020	<0.020	<0.020	<0.020	<0.020
29.0	27.8	30.8	33.5	25.8
<0.20	<0.20	0.44	<0.20	0.35
0.032	0.032	0.020	0.032	0.036
15.96	21.58	20.11	20.39	14.1
357.3	325.5	381.6	418.2	484.4
96.3	97.1	145.4	89.6	81.8
9.5	8.55	13.18	8.08	8.4
7.84	7.77	8.13	7.9	7.87

Site Location: <b>SALT CREEK @ Leachman Road</b>				
River Mile: 24.95 Storet: 300491				
6/24/2008 9:52 AM	7/8/2008 2:33 PM	7/29/2008 12:49 PM	8/14/2008 3:10 PM	9/24/2008 11:28 AM
NA	NA	NA	NA	NA
198	184	206	222	260
13	43	5	5	<5
<2.0	<2.0	<2.0	<2.0	2.2
<0.20	<0.20	<0.20	<0.20	<0.20
<2.0	<2.0	<2.0	<2.0	<2.0
<2.0	<2.0	<2.0	<2.0	<2.0
<2.0	<2.0	<2.0	<2.0	<2.0
2.2	2.7	<2.0	<2.0	2.3
<2.0	<2.0	<2.0	<2.0	<2.0
469	957	<200	<200	<200
41	42	41	48	62
42	35	49	49	57
142	120	164	168	200
1200	2260	486	924	969
9	8	10	11	14
169	178	179	275	456
3	3	3	5	9
7	6	7	9	12
128	108	143	141	215
<10	<10	<10	<10	<10
<0.20	<0.20	<0.20	<0.20	<0.20
<5.0	<5.0	<5.0	<5.0	<5.0
99.7	82.0	134	146	164
0.067	0.071	0.070	0.298	1.31
<10	<10	<10	18	17
12.3	9.7	13.7	16.9	21.4
296	261	342	359	458
1.01	1.56	0.87	0.54	0.50
0.031	<0.020	0.023	0.102	0.115
23.9	24.7	26.6	28.9	20.1
0.42	0.60	0.46	0.82	1.76
0.060	0.058	0.044	0.069	0.092
15.91	22.28	21.73	21.93	15.59
311	272.7	339.3	379	467.8
89.7	95	143.9	84.4	74.9
8.86	8.26	12.64	7.39	7.45
7.7	7.66	8.11	7.74	7.87

Appendix Table 1. Continued.

Parameter	Units
BOD5	mg/L
Total Dissolved Solids	mg/L
Total Suspended Solids	mg/L
Arsenic	ug/L
Cadmium	ug/L
Chromium	ug/L
Copper	ug/L
Lead	ug/L
Nickel	ug/L
Selenium	ug/L
Aluminum	ug/L
Barium	ug/L
Calcium	mg/L
Hardness, Total	mg/L
Iron	ug/L
Magnesium	mg/L
Manganese	ug/L
Potassium	mg/L
Sodium	mg/L
Strontium	ug/L
Zinc	ug/L
Mercury	ug/L
Acidity	mg/L
Alkalinity	mg/L
Ammonia	mg/L
COD	mg/L
Chloride	mg/L
Conductivity	umhos/cm
Nitrate+nitrite	mg/L
Nitrite	mg/L
Sulfate	mg/L
TKN	mg/L
Total Phosphorus	mg/L
<b>Field Measurements</b>	
Temperature	°C
Conductivity	µmhos/cm
D.O. Saturation	%
Dissolved Oxygen	mg/L
pH	S.U.

Site Location: <b>SALT CREEK @ Knipe Road</b> River Mile: 23.43 Storet: R16G01				
6/24/2008 9:28 AM	7/8/2008 2:12 PM	7/29/2008 1:06 PM	8/14/2008 3:25 PM	Dupl A/B 9/24/2008 12:40 PM
NA	NA	NA	NA	NA
198	168	212	236	236/ 238
<5	12	<5	<5	<5/ <5
<2.0	<2.0	<2.0	<2.0	<2.0/ <2.0
<0.20	<0.20	<0.20	<0.20	<0.20/ <0.20
<2.0	<2.0	<2.0	<2.0	<2.0/ <2.0
<2.0	<2.0	2.0	<2.0	<2.0/ <2.0
<2.0	<2.0	<2.0	<2.0	<2.0/ <2.0
<2.0	2.1	2.0	<2.0	<2.0/ <2.0
<2.0	<2.0	<2.0	<2.0	<2.0/ <2.0
260	291	<200	<200	<200/ <200
39	34	43	38	53/ 57
39	31	44	42	46/ 46
134	110	151	150	168/ 183
843	841	616	630	846/ 927
9	8	10	11	13/ 14
115	82	117	132	228/ 246
3	3	5	5	8/ 8.0
8	7	9	11	13/ 14
120	97	134	129	175/ 188
<10	<10	33	<10	<10/ <10
<0.20	<0.20	<0.20	<0.20	<0.20/ <0.20
<5.0	<5.0	<5.0	<5.0	<5.0/ <5.0
90.9	73.2	122	127	128/ 127
<0.050	<0.050	0.090	<0.050	<0.050/ <0.05
<10	<10	21	17	<10/ 11
15.8	12.7	17.1	18.7	23.8/ 23.6
290	254	333	342	412/ 411
1.02	1.42	1.11	0.65	0.42/ 0.44
0.033	<0.020	0.062	<0.020	<0.020/ <0.02
24.8	24.0	28.5	31.9	29.5/ 29.5
0.38	0.27	0.75	0.30	0.48/ 0.48
0.045	0.029	<0.010	0.038	0.031/ 0.035
16.38	21.95	21.73	21.77	16.39
306	264.8	330.7	358.2	420
91.8	96.6	134.8	84.4	88.1
8.97	8.45	11.84	7.4	8.62
7.66	7.68	7.93	7.99	7.78

Site Location: <b>SALT CREEK @ Norfield Road</b> River Mile: 18.3 Storet: 300490				
6/24/2008 9:13 AM	7/8/2008 1:49 PM	7/29/2008 1:21 PM	8/14/2008 3:40 PM	9/24/2008 12:54 PM
NA	NA	NA	NA	NA
186	164	202	202	206
5	17	<5	<5	<5
<2.0	<2.0	<2.0	<2.0	<2.0
<0.20	<0.20	<0.20	<0.20	<0.20
<2.0	<2.0	<2.0	<2.0	<2.0
<2.0	<2.0	<2.0	<2.0	<2.0
<2.0	<2.0	<2.0	<2.0	<2.0
<2.0	<2.0	<2.0	<2.0	<2.0
<2.0	<2.0	<2.0	<2.0	2.0
<2.0	<2.0	<2.0	<2.0	<2.0
<200	324	<200	<200	<200
37	35	39	36	46
35	29	38	39	41
124	101	132	139	152
718	939	560	477	703
9	7	9	10	12
118	83	123	195	256
3	3	4	4	7
8	7	8	9	11
110	93	117	108	160
<10	<10	<10	<10	<10
<0.20	<0.20	<0.20	<0.20	<0.20
<5.0	<5.0	<5.0	<5.0	<5.0
82.4	70.1	109	115	112
<0.050	<0.050	<0.050	0.051	<0.050
<10	<10	<10	10	<10
15.7	11.8	17.0	17.1	20.9
273	241	316	318	363
1.72	1.58	0.95	0.35	<0.10
<0.020	<0.020	<0.020	<0.020	<0.020
24.1	24.1	27.5	29.2	26.6
0.28	<0.20	0.65	<0.20	0.37
0.025	0.027	0.014	0.022	0.024
17.11	22.65	21.88	21.74	16.45
287	265.9	309.2	329.8	366
90.8	96.3	147.7	99.9	91.2
8.74	8.31	12.93	8.77	8.9
7.61	7.72	7.98	7.99	8.09

Appendix Table 1. Continued.

Parameter	Units
BOD5	mg/L
Total Dissolved Solids	mg/L
Total Suspended Solids	mg/L
Arsenic	ug/L
Cadmium	ug/L
Chromium	ug/L
Copper	ug/L
Lead	ug/L
Nickel	ug/L
Selenium	ug/L
Aluminum	ug/L
Barium	ug/L
Calcium	mg/L
Hardness, Total	mg/L
Iron	ug/L
Magnesium	mg/L
Manganese	ug/L
Potassium	mg/L
Sodium	mg/L
Strontium	ug/L
Zinc	ug/L
Mercury	ug/L
Acidity	mg/L
Alkalinity	mg/L
Ammonia	mg/L
COD	mg/L
Chloride	mg/L
Conductivity	umhos/cm
Nitrate+nitrite	mg/L
Nitrite	mg/L
Sulfate	mg/L
TKN	mg/L
Total Phosphorus	mg/L
<b>Field Measurements</b>	
Temperature	°C
Conductivity	µmhos/cm
D.O. Saturation	%
Dissolved Oxygen	mg/L
pH	S.U.

Site Location: <b>SALT CREEK @ US 40</b> River Mile: 12.91 Storet: R16G03				
6/24/2008 12:05 PM	7/8/2008 1:13 PM	7/29/2008 12:03 PM	8/14/2008 2:13 PM	9/24/2008 11:55 AM
NA	NA	NA	NA	NA
208	176	210	214	228
8	11	6	5	6
<2.0	<2.0	<2.0	<2.0	<2.0
<0.20	<0.20	<0.20	<0.20	<0.20
<2.0	<2.0	<2.0	<2.0	<2.0
<2.0	<2.0	2.4	<2.0	<2.0
<2.0	<2.0	<2.0	<2.0	<2.0
<2.0	<2.0	<2.0	<2.0	<2.0
<2.0	<2.0	<2.0	<2.0	<2.0
<2.0	<2.0	<2.0	<2.0	<2.0
<2.0	<2.0	<2.0	<2.0	<2.0
224	252	<200	<200	<200
49	43	51	46	63
41	34	42	37	44
139	118	146	138	159
622	738	492	423	618
9	8	10	11	12
72	71	91	112	306
3	3	3	4	7
11	9	11	13	16
134	111	136	115	165
<10	<10	<10	<10	<10
<0.20	<0.20	<0.20	<0.20	<0.20
<5.0	<5.0	<5.0	<5.0	<5.0
93.7	83.2	120	119	123
<0.050	<0.050	<0.050	0.050	<0.050
<10	<10	<10	19	<10
19.2	14.6	20.0	22.1	28.6
310	274	335	327	402
0.72	1.32	0.59	0.28	0.32
<0.020	<0.020	<0.020	<0.020	<0.020
27.2	25.1	27.9	29.2	24.9
<0.20	0.26	<0.20	0.22	0.54
0.020	0.021	0.011	0.031	0.045
20.76	23.15	22.39	25.12	18.6
328.8	289.8	332.9	348.9	410.7
122.6	104.2	155	105.2	107.4
10.97	8.91	13.44	8.66	10.04
7.96	7.89	8.07	7.89	7.9

Site Location: <b>SALT CREEK Adj. Manns Fork Road</b> River Mile: 1.1 Storet: 300488				
6/24/2008 5:45 PM	7/8/2008 9:18 AM	7/29/2008 8:59 AM	8/14/2008 11:04 AM	9/24/2008 8:54 AM
NA	NA	NA	NA	NA
308	220	298	354	358
10	26	<5	<5	7
<2.0	<2.0	<2.0	<2.0	<2.0
<0.20	<0.20	<0.20	<0.20	<0.20
<2.0	<2.0	<2.0	<2.0	<2.0
<2.0	<2.0	<2.0	<2.0	<2.0
<2.0	<2.0	<2.0	<2.0	<2.0
2.2	3.0	2.0	<2.0	2.3
<2.0	<2.0	<2.0	<2.0	<2.0
211	669	<200	<200	<200
63	59	74	74	91
55	43	61	61	63
199	157	222	226	240
611	1500	401	343	649
15	12	17	18	20
225	146	334	358	765
3	3	3	3	4
15	12	16	18	26
218	172	224	227	326
<10	<10	14	<10	<10
<0.20	<0.20	<0.20	<0.20	<0.20
<5.0	<5.0	<5.0	<5.0	<5.0
116	101	150	170	141
<0.050	<0.050	0.056	0.054	<0.050
<10	<10	21	24	20
26.2	17.4	29.4	30.8	45.6
446	347	484	521	595
0.39	0.81	0.36	0.61	<0.10
<0.020	<0.020	<0.020	<0.020	<0.020
64.1	44.5	60.0	68.5	72.6
0.36	<0.20	0.41	0.22	0.36
0.016	0.028	0.010	0.017	0.013
22.33	21.67	20.34	20.9	16.98
496.6	366.6	478.2	540.6	601
103.1	87.3	112.1	76.4	82.5
8.95	7.68	10.11	6.81	7.96
8.92	7.41	7.73	7.16	8.09

Appendix Table 1. Continued.

		Site Location: <b>SALT CREEK @ SR 146 (USGS Gage)</b>									
		River Mile: 5.6 Stort: R16G23									
Parameter	Units	2/11/2008	3/27/2008	4/17/2008	5/28/2008	6/24/2008	Dupl A	Dupl B	Dupl A	Dupl B	
		9:32 AM	8:55 AM	10:20 AM	8:55 AM	2:19 PM	7/8/2008 10:55 AM	7/8/2008 10:55 AM	7/29/2008 10:23 AM	8/14/2008 12:26 PM	8/14/2008 12:26 PM
BOD5	mg/L	<2.0	NA	NA	NA	NA	NA	NA	NA	NA	
Total Dissolved Solids	mg/L	174	180	192	204	232	202	196	264	332	
Total Suspended Solids	mg/L	7	15	<5	5	5	20	20	<5	5	
Arsenic	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	
Cadmium	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	0.75	<0.20	
Lead	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	
Selenium	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	
Aluminum	ug/L	253	228	<200	<200	<200	316	405	<200	<200	
Barium	ug/L	45	39	40	50	49	47	48	58	67	
Calcium	mg/L	35	29	35	41	43	36	36	48	55	
Chromium	ug/L	<30	<30	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	
Copper	ug/L	<10	<10	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	
Hardness, Total	mg/L	128	105	129	152	157	131	131	173	207	
Iron	ug/L	826	641	456	558	488	905	1030	441	450	
Magnesium	mg/L	10	8	10	12	12	10	10	13	17	
Manganese	ug/L	184	106	111	107	81	96	98	130	203	
Nickel	ug/L	<40	<40	<2.0	<2.0	<2.0	<2.0	2.0	<2.0	<2.0	
Potassium	mg/L	2	2	2	2	3	3	3	3	4	
Sodium	mg/L	11	10	11	12	12	10	10	13	17	
Strontium	ug/L	124	103	131	153	162	123	124	171	231	
Zinc	ug/L	<10	<10	<10	<10	<10	<10	<10	<10	<10	
Mercury	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	
Acidity	mg/L	<5.0	NA	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	
Alkalinity	mg/L	70.5	NA	78.2	108	100	89.2	91.4	131	139	
Ammonia	mg/L	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	
COD	mg/L	<10	<10	<10	<10	<10	<10	<10	<10	16	
Chloride	mg/L	22.0	19.5	19.1	19.1	21.6	17.2	17.2	26.0	30.3	
Conductivity	umhos/cm	302	276	301	320	353	309	308	406	464	
Nitrate+nitrite	mg/L	1.60	1.29	0.48	0.57	0.60	1.10	1.10	0.39	0.16	
Nitrite	mg/L	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	
Sulfate	mg/L	39.7	NA	40.1	41.5	41.4	32.9	32.7	44.8	61.8	
TKN	mg/L	0.20	<0.20	<0.20	<0.20	0.41	<0.20	0.22	0.45	<0.20	
Total Phosphorus	mg/L	0.010	0.015	0.011	0.016	0.018	0.029	0.024	0.011	0.016	
<b>Field Measurements</b>											
Temperature	°C	0.3	6.36	11.2	14.6	21.74	22.47	22.47	20.83	21.29	
Conductivity	µmhos/cm	284	265.6	312.5	366	375.6	327	327	403	482.3	
D.O. Saturation	%	127.7	98.6	93.9	85.1	116.5	93.7	93.7	<b>133</b>	85.9	
Dissolved Oxygen	mg/L	18.64	12.15	10.3	8.64	10.23	8.11	8.11	11.89	7.61	
pH	S.U.	8.85	8.54	7.77	NA	8.01	7.6	7.6	7.97	7.69	

Appendix Table 1. Continued.

Parameter	Units
BOD5	mg/L
Total Dissolved Solids	mg/L
Total Suspended Solids	mg/L
Arsenic	ug/L
Cadmium	ug/L
Chromium	ug/L
Copper	ug/L
Lead	ug/L
Nickel	ug/L
Selenium	ug/L
Aluminum	ug/L
Barium	ug/L
Calcium	mg/L
Hardness, Total	mg/L
Iron	ug/L
Magnesium	mg/L
Manganese	ug/L
Potassium	mg/L
Sodium	mg/L
Strontium	ug/L
Zinc	ug/L
Mercury	ug/L
Acidity	mg/L
Alkalinity	mg/L
Ammonia	mg/L
COD	mg/L
Chloride	mg/L
Conductivity	umhos/cm
Nitrate+nitrite	mg/L
Nitrite	mg/L
Sulfate	mg/L
TKN	mg/L
Total Phosphorus	mg/L
<b>Field Measurements</b>	
Temperature	°C
Conductivity	µmhos/cm
D.O. Saturation	%
Dissolved Oxygen	mg/L
pH	S.U.

Site Location: <b>SALT CREEK @ SR 146 (USGS Gage) - Continued</b>				
River Mile: 5.6 R16G23				
Dupl A	Dupl B			
9/24/2008	9/24/2008	10/29/2008	11/17/2008	12/10/2008
10:12 AM	10:12 AM	11:16 AM	10:09 AM	8:50 AM
NA	NA	NA	NA	NA
366	360	326	302	314
<5	<5	<5	<5	<5
<2.0	<2.0	<2.0	<2.0	<2.0
<0.20	<0.20	<0.20	<0.20	<0.20
<2.0	<2.0	<2.0	<2.0	<2.0
<2.0	<2.0	<2.0	<2.0	<2.0
<2.0	<2.0	8.0	<2.0	<2.0
<2.0	<2.0	<2.0	<2.0	2.1
<2.0	<2.0	<2.0	<2.0	<2.0
<200	<200	<200	<200	<200
79	80	62	60	55
61	62	57	59	58
243	245	221	221	223
425	438	432	409	681
22	22	19	18	19
278	280	74	66	148
5	5	5	5	3
21	21	21	19	20
307	307	264	252	234
<10	<10	<10	<10	<10
<0.20	<0.20	<0.20	<0.20	<0.20
<5.0	<5.0	<5.0	<5.0	<5.0
135	132	132	124	114
<0.050	<0.050	<0.050	<0.050	<0.050
<10	<10	<10	<10	<20
35.5	35.6	39.3	34.4	40.6
556	559	553	509	529
<0.10	<0.10	<0.10	0.10	0.22
<0.020	<0.020	<0.020 PT	<0.020	<0.020
83.3	83.5	73.8	70.3	91.1
<0.20	0.22	0.21	<0.20	0.28
<0.010	<0.010	0.019	0.015	0.012
<b>Field Measurements</b>				
16.58	16.58	6.67	5.33	1.04
570.2	570.2	540.6	478.4	510.3
95.2	95.2	107.3	122.7	102
9.27	9.27	13.11	15.52	14.46
8.09	8.09	8.18	8.17	7.41

Site Location: <b>PRAIRIE FORK @ Mouth</b>				
River Mile: 0.1 Storet: 300492				
6/24/2008	7/8/2008	7/29/2008	8/14/2008	9/24/2008
9:40 AM	2:09 PM	1:09 PM	3:28 PM	12:44 PM
NA	NA	NA	NA	NA
202	178	216	230	244
<5	11	<5	<5	<5
<2.0	<2.0	<2.0	<2.0	<2.0
<0.20	<0.20	<0.20	<0.20	<0.20
<2.0	<2.0	<2.0	<2.0	<2.0
<2.0	<2.0	<2.0	<2.0	<2.0
<2.0	<2.0	<2.0	<2.0	<2.0
<2.0	<2.0	<2.0	<2.0	<2.0
<2.0	<2.0	<2.0	<2.0	<2.0
<2.0	<2.0	<2.0	<2.0	<2.0
<200	279	<200	<200	<200
38	35	40	37	49
36	30	40	40	46
127	108	141	145	168
674	852	630	690	519
9	8	10	11	13
137	91	138	185	201
3	3	4	4	9
9	8	10	12	15
113	95	123	114	175
<10	<10	<10	<10	<10
<0.20	<0.20	<0.20	<0.20	<0.20
<5.0	<5.0	<5.0	<5.0	<5.0
86.2	72.0	113	115	122
0.279	<0.050	0.053	0.054	0.080
<10	<10	<10	18	11
22.3	15.8	20.0	21.8	27.3
301	258	330	339	423
1.04	1.42	0.89	0.40	0.44
0.038	<0.020	<0.020	<0.020	<0.020
26.5	24.3	29.3	34.7	34.1
0.27	<0.20	0.68	<0.20	0.73
0.027	0.036	0.021	0.026	0.024
<b>Field Measurements</b>				
16.93	22.81	21.47	21.68	16.32
317	269.8	325.8	355.1	425.6
88	97.2	135.9	93.7	85.3
8.5	8.36	12	8.23	8.36
7.66	7.7	7.83	7.83	7.81

Appendix Table 1. Continued.

Parameter	Units
BOD5	mg/L
Total Dissolved Solids	mg/L
Total Suspended Solids	mg/L
Arsenic	ug/L
Cadmium	ug/L
Chromium	ug/L
Copper	ug/L
Lead	ug/L
Nickel	ug/L
Selenium	ug/L
Aluminum	ug/L
Barium	ug/L
Calcium	mg/L
Hardness, Total	mg/L
Iron	ug/L
Magnesium	mg/L
Manganese	ug/L
Potassium	mg/L
Sodium	mg/L
Strontium	ug/L
Zinc	ug/L
Mercury	ug/L
Acidity	mg/L
Alkalinity	mg/L
Ammonia	mg/L
COD	mg/L
Chloride	mg/L
Conductivity	umhos/cm
Nitrate+nitrite	mg/L
Nitrite	mg/L
Sulfate	mg/L
TKN	mg/L
Total Phosphorus	mg/L
<b>Field Measurements</b>	
Temperature	°C
Conductivity	µmhos/cm
D.O. Saturation	%
Dissolved Oxygen	mg/L
pH	S.U.

Site Location: <b>MANN'S FORK @ Cutler Lake Road</b> River Mile: 4.2 Storet: 201242				
6/24/2008 4:21 PM	7/8/2008 9:34 AM	7/29/2008 9:23 AM	8/14/2008 11:32 AM	9/24/2008 9:07 AM
NA	NA	NA	NA	NA
204	158	190	198	206
<5	<5	<5	<5	<5
<2.0	<2.0	<2.0	<2.0	<2.0
<0.20	<0.20	<0.20	<0.20	<0.20
<2.0	<2.0	<2.0	<2.0	<2.0
<2.0	<2.0	<2.0	<2.0	<2.0
<2.0	<2.0	<2.0	<2.0	<2.0
<2.0	<2.0	<2.0	<2.0	<2.0
<2.0	<2.0	<2.0	<2.0	<2.0
<20.0 UJ	<2.0	<2.0	<2.0	<2.0
209	<200	<200	<200	<200
45	39	48	45	53
42	34	45	42	48
142	118	149	142	161
308	<50	72	50	115
9	8	9	9	10
23	13	19	14	117
2	2	2	2	2
7	7	8	10	13
173	145	173	167	219
<10	<10	<10	<10	<10
<0.20	<0.20	<0.20	<0.20	<0.20
<5.0	<5.0	<5.0	<5.0	<5.0
96.0	91.5	126	126	128
<0.050	<0.050	<0.050	<0.050	<0.050
<10	<10	12	<10	<10
8.8	6.7	9.2	10.7	13.1
292	255	316	316	371
1320	0.10	<0.10	<0.10	<0.10
<0.020	<0.020	<0.020	<0.020	<0.020
35.0	27.3	33.2	34.3	26.0
0.22	<0.20	<0.20	<0.20	<0.20
0.012	<0.010	<0.010	0.011	0.014
21.74	19.82	19.19	20.32	14.2
318.5	270.3	310.6	332.6	375.9
116.6	86.7	106.1	83.3	71.6
10.24	7.91	9.8	7.52	7.34
8.04	7	7.76	7.63	8.19

Site Location: <b>MANN'S FORK @ Mock Drive</b> River Mile: 2.31 Storet: R16G20				
6/24/2008 3:54 PM	7/8/2008 10:01 AM	7/29/2008 9:47 AM	8/14/2008 11:43 AM	9/24/2008 9:33 PM
NA	NA	NA	NA	NA
350	240	322	352	368
<5	<5	<5	<5	<5
<2.0	<2.0	<2.0	<2.0	<2.0
<0.20	<0.20	<0.20	<0.20	<0.20
<2.0	<2.0	<2.0	<2.0	<2.0
<2.0	<2.0	<2.0	<2.0	<2.0
<2.0	<2.0	<2.0	<2.0	<2.0
<2.0	<2.0	<2.0	<2.0	<2.0
<2.0	<2.0	<2.0	<2.0	<2.0
<10.0 UJ	<2.0	<2.0	<2.0	<2.0
218	<200	<200	<200	<200
68	52	75	90	98
69	51	70	82	89
246	181	237	279	296
338	80	135	<50	88
18	13	15	18	18
17	18	30	29	40
2	2	2	3	2
12	9	10	11	12
353	252	306	352	362
<10	<10	<10	<10	<10
<0.20	<0.20	<0.20	<0.20	<0.20
<5.0	<5.0	<5.0	<5.0	<5.0
118	122	177	198	188
<0.050	<0.050	<0.050	<0.050	<0.050
<10	<10	<10	11	<10
14.9	7.2	9.1	9.7	10.6
486	381	489	515	586
1750	0.24	0.17	<0.10	<0.10
<0.020	<0.020	<0.020	<0.020	<0.020
104	58.1	75.2	74.8	84.7
0.32	<0.20	0.49	<0.20	<0.20
<0.010	0.010	<0.010	0.012	<0.010
22.26	20.94	20.3	21.66	15.26
518.6	399.3	486.2	543.4	598.6
113.1	93.6	122.8	77	75.4
9.82	8.35	11.09	6.77	7.55
8.07	7.62	7.68	7.44	8.12



Appendix Table 1. Continued.

Parameter	Units
BOD5	mg/L
Total Dissolved Solids	mg/L
Total Suspended Solids	mg/L
Arsenic	ug/L
Cadmium	ug/L
Chromium	ug/L
Copper	ug/L
Lead	ug/L
Nickel	ug/L
Selenium	ug/L
Aluminum	ug/L
Barium	ug/L
Calcium	mg/L
Hardness, Total	mg/L
Iron	ug/L
Magnesium	mg/L
Manganese	ug/L
Potassium	mg/L
Sodium	mg/L
Strontium	ug/L
Zinc	ug/L
Mercury	ug/L
Acidity	mg/L
Alkalinity	mg/L
Ammonia	mg/L
COD	mg/L
Chloride	mg/L
Conductivity	umhos/cm
Nitrate+nitrite	mg/L
Nitrite	mg/L
Sulfate	mg/L
TKN	mg/L
Total Phosphorus	mg/L
<b>Field Measurements</b>	
Temperature	°C
Conductivity	µmhos/cm
D.O. Saturation	%
Dissolved Oxygen	mg/L
pH	S.U.

Site Location: <b>KENT RUN @ Browning Road</b>					
River Mile: 1.15 Storet: 300494					
Dupl A/B					
6/24/2008	7/8/2008	7/29/2008	8/14/2008	9/24/2008	
1:06 PM	9:50 AM	9:35 AM	11:17 AM	9:22 AM	
NA	NA	NA	NA	NA	
774	370	566/ 576	566	600	
<5	<5	<5/ <5	<5	<5	
<2.0	<2.0	<2.0/ <2.0	<2.0	<2.0	
<0.20	<0.20	<0.20/ <0.20	<0.20	<0.20	
<2.0	<2.0	<2.0/ <2.0	<2.0	<2.0	
<2.0	<2.0	<2.0/ <2.0	<2.0	<2.0	
<2.0	<2.0	<2.0/ <2.0	<2.0	<2.0	
2.5	2.0	2.2/ 2.2	2.4	2.2	
<2.0	<2.0	<2.0/ <2.0	<2.0	<2.0	
<200	<200	<200/ <200	211	<200	
114	60	99/ 99	106	107	
138	73	113/ 116	116	123	
518	269	410/ 417	409	443	
<50	<50	146/ 135	612	65	
42	21	31/ 31	29	33	
13	<10	22/ 22	67	65	
3	3	3/ 3.0	3	3	
21	11	16/ 16	16	18	
836	421	659/ 664	620	729	
<10	<10	<10/ <10	<10	<10	
<0.20	<0.20	<0.20/ <0.20	<0.20	<0.20	
<5.0	<5.0	<5.0/ <5.0	<5.0	<5.0	
140	156	189/ 192	205	173	
<0.050	<0.050	<0.050/ <0.05	<0.050	<0.050	
<10	15	<10/ 12	18	<10	
51.2	7.9	9.9/ 10.0	11.8	14.3	
970	544	793/ 790	746	875	
<0.10	0.10	<0.10/ <0.10	<0.10	<0.10	
<0.020	<0.020	<0.020/ <0.02	<0.020	<0.020	
318	116	233/ 239	243	226	
<0.20	<0.20	<0.20/ <0.20	<0.20	0.22	
<0.010	0.010	<0.010/ <0.01	0.034	<0.010	
22.94	20.96	19.79	20.66	16.3	
1041.2	573.5	776.6	801.2	890.8	
100	88.6	96.7	69.6	73.5	
8.57	7.89	8.81	6.23	7.19	
7.75	7.53	7.77	7.25	7.81	

Site Location: <b>BOGGS CREEK @ SR 146 NR Three Towers Rd.</b>					
River Mile: 4.04 Storet: R16G17					
6/24/2008	7/8/2008	7/29/2008	8/14/2008	9/24/2008	
3:25 PM	11:09 AM	10:00 AM	12:09 PM	10:00 AM	
NA	NA	NA	NA	NA	
402	284	500	654	674	
9	30	8	6	<5	
<2.0	<2.0	<2.0	<2.0	<2.0	
<0.20	<0.20	<0.20	<0.20	<0.20	
<2.0	<2.0	<2.0	<2.0	<2.0	
2.1	<2.0	<2.0	<2.0	<2.0	
<2.0	<2.0	<2.0	<2.0	<2.0	
9.5	7.0	9.7	7.3	6.0	
<2.0	<2.0	<2.0	<2.0	<2.0	
697	610	<200	<200	<200	
60	51	71	92	107	
58	43	71	89	98	
227	165	284	370	401	
1510	1310	564	506	386	
20	14	26	36	38	
396	264	355	494	594	
3	2	3	4	6	
20	15	22	24	26	
200	140	253	315	358	
<10	<10	<10	<10	<10	
<0.20	<0.20	<0.20	<0.20	<0.20	
<5.0	<5.0	8.6 RC	<5.0	<5.0	
89.1	86.5	107 RC	93.1	87.0	
0.058	<0.050	0.060	0.066	0.063	
14	<10	15	11	<10	
38.1	26.7	38.6	38.6	44.8	
525	405	658	728	857	
0.36	0.53	0.24	0.16	0.26	
<0.020	<0.020	<0.020	<0.020	0.028	
117	69.1	185	276	271	
0.53	<0.20	0.54	0.33	0.50	
0.023	0.024	<0.010	0.015	0.013	
22.18	21.76	19.83	20.91	15.4	
561.1	423.1	651.9	791.5	875.4	
107.9	95	129.8	76.7	77.7	
9.39	8.34	11.82	6.84	7.74	
7.78	7.58	7.72	7.52	7.86	

Appendix Table 1. Continued.

Parameter	Units
BOD5	mg/L
Total Dissolved Solids	mg/L
Total Suspended Solids	mg/L
Arsenic	ug/L
Cadmium	ug/L
Chromium	ug/L
Copper	ug/L
Lead	ug/L
Nickel	ug/L
Selenium	ug/L
Aluminum	ug/L
Barium	ug/L
Calcium	mg/L
Hardness, Total	mg/L
Iron	ug/L
Magnesium	mg/L
Manganese	ug/L
Potassium	mg/L
Sodium	mg/L
Strontium	ug/L
Zinc	ug/L
Mercury	ug/L
Acidity	mg/L
Alkalinity	mg/L
Ammonia	mg/L
COD	mg/L
Chloride	mg/L
Conductivity	umhos/cm
Nitrate+nitrite	mg/L
Nitrite	mg/L
Sulfate	mg/L
TKN	mg/L
Total Phosphorus	mg/L
<b>Field Measurements</b>	
Temperature	°C
Conductivity	µmhos/cm
D.O. Saturation	%
Dissolved Oxygen	mg/L
pH	S.U.

Site Location: <b>BOGGS CREEK @ Salt Creek Road</b>					
River Mile: 0.9 Storet: R16G15					
6/24/2008	7/8/2008	7/29/2008	8/14/2008	9/24/2008	
3:37 PM	10:17 AM	10:00 AM	11:57 AM	9:48 AM	
NA	NA	NA	NA	NA	
356	262	436	464	472	
11	10	<5	<5	<5	
<2.0	<2.0	<2.0	<2.0	<2.0	
<0.20	<0.20	<0.20	<0.20	<0.20	
<2.0	<2.0	<2.0	<2.0	<2.0	
<2.0	<2.0	<2.0	<2.0	<2.0	
<2.0	<2.0	<2.0	<2.0	<2.0	
4.0	3.7	3.5	2.8	3.2	
<2.0	<2.0	<2.0	<2.0	<2.0	
514	316	<200	<200	<200	
60	54	83	79	97	
50	42	65	66	79	
195	158	253	268	313	
1040	685	203	210	63	
17	13	22	25	28	
92	89	24	27	33	
3	3	3	4	6	
16	14	19	23	23	
179	141	223	244	286	
<10	<10	<10	<10	<10	
<0.20	<0.20	<0.20	<0.20	<0.20	
<5.0	<5.0	<5.0	<5.0	<5.0	
84.9	92.9	122	118	132	
<0.050	<0.050	<0.050	<0.050	<0.050	
<10	<10	<10	19	14	
29.6	24.9	34.4	34.7	38.7	
437	380	592	599	682	
0.44	0.65	0.34	0.12	<0.10	
<0.020	<0.020	<0.020	<0.020	<0.020	
94.1	58.6	142	172	136	
0.45	<0.20	<0.20	<0.20	0.37	
0.023	0.016	<0.010	0.011	0.010	
<b>Field Measurements</b>					
23	22	20.2	21.38	15.17	
479.7	398.3	584.1	634.9	688.8	
125	102.6	150.4	94.6	106.2	
10.71	8.96	13.6	8.36	10.64	
8.53	7.81	8.14	8.22	8.28	

Site Location: <b>BUFFALO FORK @ Leedom Road</b>					
River Mile: 6.55 Storet: R16G12					
6/24/2008	7/8/2008	7/29/2008	8/14/2008	9/24/2008	
1:04 PM	12:22 PM	11:05 AM	1:15 PM	10:57 AM	
NA	NA	NA	NA	NA	
1080	630	950	1050	1240	
<5	<5	<5	<5	<5	
<2.0	<2.0	<2.0	<2.0	<2.0	
<0.20	<0.20	<0.20	<0.20	<0.20	
<2.0	<2.0	<2.0	<2.0	<2.0	
<2.0	<2.0	<2.0	<2.0	<2.0	
<2.0	<2.0	<2.0	<2.0	<2.0	
2.9	2.8	3.3	2.4	2.7	
<2.0	<2.0	<2.0	<2.0	<2.0	
<200	<200	<200	<200	<200	
101	64	94	103	126	
158	104	139	145	173	
625	408	541	568	663	
<50	<50	<50	<50	151	
56	36	47	50	56	
12	11	14	12	54	
3	2	3	3	3	
81	31	67	94	131	
1100	672	949	1080	1210	
<10	<10	<10	<10	<10	
<0.20	<0.20	<0.20	<0.20	<0.20	
<5.0	<5.0	<5.0	<5.0	<5.0	
169	180	210	195	164	
<0.050	<0.050	0.051	<0.050	<0.050	
11	<10	<10	17	<10	
16.3	10.5	21.7	30.4	42.5	
1280	850	1220	1180	1580	
<0.10	0.11	<0.10	<0.10	<0.10	
<0.020	<0.020	<0.020	<0.020	<0.020	
544	275	470	539	612	
<0.20	<0.20	<0.20	<0.20	0.27	
<0.010	<0.010	<0.010	0.010	<0.010	
<b>Field Measurements</b>					
24.13	24.14	21.76	23.72	17.91	
1376.9	899.7	1211.9	1335.2	1633	
142.9	105.3	138.8	92.6	90	
11.95	8.82	12.15	7.81	8.5	
8.28	7.94	8.03	7.75	7.94	

Appendix Table 1. Continued.

Parameter	Units
BOD5	mg/L
Total Dissolved Solids	mg/L
Total Suspended Solids	mg/L
Arsenic	ug/L
Cadmium	ug/L
Chromium	ug/L
Copper	ug/L
Lead	ug/L
Nickel	ug/L
Selenium	ug/L
Aluminum	ug/L
Barium	ug/L
Calcium	mg/L
Hardness, Total	mg/L
Iron	ug/L
Magnesium	mg/L
Manganese	ug/L
Potassium	mg/L
Sodium	mg/L
Strontium	ug/L
Zinc	ug/L
Mercury	ug/L
Acidity	mg/L
Alkalinity	mg/L
Ammonia	mg/L
COD	mg/L
Chloride	mg/L
Conductivity	umhos/cm
Nitrate+nitrite	mg/L
Nitrite	mg/L
Sulfate	mg/L
TKN	mg/L
Total Phosphorus	mg/L
<b>Field Measurements</b>	
Temperature	°C
Conductivity	µmhos/cm
D.O. Saturation	%
Dissolved Oxygen	mg/L
pH	S.U.

Site Location: <b>BUFFALO FORK @ Tumblin Road (Okey Road)</b>											
River Mile: 2.13 Storet: R16G11											
				Dupl A	Dupl B	Dupl A	Dupl B				
2/11/2008	3/27/2008	4/17/2008	5/28/2008	6/24/2008	6/24/2008	7/8/2008	7/8/2008	7/29/2008	8/14/2008		
9:19 AM	8:47 AM	10:06 AM	8:44 AM	1:48 PM	1:48 PM	11:48 AM	11:48 AM	10:52 AM	12:59 PM		
<2.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
306	366	414	422	552	544	334	356	526	582		
5	7	5	7	<5	<5	8	7	6	<5		
<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	
<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	
<30	<30	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	
<10	<10	2.2	2.4	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	
<2.0	2.0	<2.0	<2.0	<2.0	2.4	<2.0	2.5	<2.0	<2.0	<2.0	
<40	<40	<2.0	2.5	2.3	2.3	2.2	2.2	2.8	2.1		
<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	
<200	<200	<200	<200	<200	<200	236	245	<200	<200		
45	45	54	62	85	85	59	59	89	96		
60	61	74	77	96	95	65	66	92	94		
224	231	284	291	355	348	241	243	337	346		
335	205	170	302	223	204	374	368	297	159		
18	19	24	24	28	27	19	19	26	27		
74	35	46	71	64	65	47	48	77	50		
2	2	2	2	3	3	3	3	3	3		
17	15	22	23	33	33	18	19	38	49		
322	337	445	448	546	539	352	355	577	619		
<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	
<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	
<5.0	NA	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	
117	NA	125	143	144	145	145	144	188	186		
<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	
10	<10	<10	<10	15	21	<10	<10	<10	22		
17.8	13.8	15.0	15.5	29.3	29.6	17.4	17.3	37.7	53.9		
491	543	589	566	746	759	531	532	781	794		
0.47	0.27	<0.10	0.12	0.12	0.12	0.27	0.24	<0.10	<0.10		
<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	
113	NA	164	161	221	226	98.5	102	197	201		
<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	
0.013	0.011	<0.010	0.013	0.010	0.010	0.017	0.016	0.113	0.015		
0.1					23.63					23.77	
6.37					22.76					23.42	
10.74					22.76					782.1	
15.15					560.3					154.4	
23.63					560.3					93.8	
455					102					7.91	
518					102					8.03	
620					13.12						
671					8.25						
814.8					8.25						
122.6					8.25						
104.4					8.25						
96.8					8.25						
95.4					8.25						
82.4					8.25						
122.6					8.25						
15.21					8.25						
11.93					8.25						
10.57					8.25						
8.27					8.25						
10.37					8.25						
8.48					8.25						
8.38					8.25						
7.76					8.25						
NA					8.25						
8.17					8.25						

Appendix Table 1. Continued.

Parameter	Units
BOD5	mg/L
Total Dissolved Solids	mg/L
Total Suspended Solids	mg/L
Arsenic	ug/L
Cadmium	ug/L
Chromium	ug/L
Copper	ug/L
Lead	ug/L
Nickel	ug/L
Selenium	ug/L
Aluminum	ug/L
Barium	ug/L
Calcium	mg/L
Hardness, Total	mg/L
Iron	ug/L
Magnesium	mg/L
Manganese	ug/L
Potassium	mg/L
Sodium	mg/L
Strontium	ug/L
Zinc	ug/L
Mercury	ug/L
Acidity	mg/L
Alkalinity	mg/L
Ammonia	mg/L
COD	mg/L
Chloride	mg/L
Conductivity	umhos/cm
Nitrate+nitrite	mg/L
Nitrite	mg/L
Sulfate	mg/L
TKN	mg/L
Total Phosphorus	mg/L
<b>Field Measurements</b>	
Temperature	°C
Conductivity	µmhos/cm
D.O. Saturation	%
Dissolved Oxygen	mg/L
pH	S.U.

Site Location: <b>BUFFALO FORK @ Tumblin Rd (Okey Rd)- Cont.</b>				
River Mile: 2.13 Storet: R16G11				
9/24/2008 10:43 AM	10/29/2008 11:09 AM	11/17/2008 9:59 AM	12/10/2008 8:43 AM	
NA	NA	NA	NA	
704	698	828	826	
<5	<5	<5	<5	
<2.0	<2.0	<2.0	<2.0	
<0.20	<0.20	<0.20	<0.20	
<2.0	<2.0	<2.0	<2.0	
<2.0	<2.0	<2.0	2.2	
<2.0	<2.0	<2.0	<2.0	
2.4	3.0	3.3	3.9	
<2.0	<2.0	<2.0	<2.0	
<200	<200	<200	<200	
133	98	101	84	
122	111	134	126	
445	405	491	475	
169	76	165	127	
34	31	38	39	
43	26	45	84	
4	4	3	3	
70	71	80	83	
805	742	778	759	
<10	<10	<10	<10	
<0.20	<0.20	<0.20	<0.20	
<5.0	<5.0	<5.0	<5.0	
177	168	163	158	
<0.050	<0.050	<0.050	<0.050	
<10	<10	<10	<20	
69.6	81.6	41.3	49.1	
1050	1100	1190	1200	
<0.10	<0.10	<0.10	0.19	
<0.020	<0.020 PT	<0.020	<0.020	
252	253	394	435	
0.55	0.32	0.21	0.36	
0.034	0.026	0.025	0.020	
16.25	6.22	5.79	2.28	
1081.1	1069	1113	1102	
94.6	105.2	121.2	99.7	
9.26	12.99	15.11	13.64	
8.1	8.15	8.26	7.12	

Site Location: <b>BUFFALO FORK @ Farm Lane off SR 146</b>				
River Mile: 0.7 Storet: 300495				
6/24/2008 3:08 PM	7/8/2008 10:39 AM	7/29/2008 10:41 AM	8/14/2008 12:44 PM	9/24/2008 10:30 AM
NA	NA	NA	NA	NA
512	334	500	536	562
<5	29	<5	9	<5
<2.0	<2.0	<2.0	<2.0	<2.0
<0.20	<0.20	<0.20	<0.20	<0.20
<2.0	<2.0	<2.0	<2.0	<2.0
<2.0	<2.0	<2.0	2.0	<2.0
<2.0	<2.0	<2.0	<2.0	<2.0
2.3	2.6	2.2	2.9	2.3
<2.0	<2.0	<2.0	<2.0	<2.0
<200	473	<200	<200	<200
85	66	87	86	99
93	65	93	92	104
339	241	335	337	375
146	925	135	154	203
26	19	25	26	28
49	65	103	238	254
3	3	3	3	4
32	18	32	38	48
510	349	510	503	613
<10	<10	<10	<10	<10
<0.20	<0.20	<0.20	<0.20	<0.20
<5.0	<5.0	<5.0	<5.0	<5.0
147	147	195	198	180
<0.050	<0.050	<0.050	<0.050	<0.050
11	<10	<10	193	<10
29.1	16.3	32.3	42.8	45.9
719	520	742	746	878
0.10	0.25	<0.10	<0.10	<0.10
<0.020	<0.020	<0.020	<0.020	<0.020
188	92.7	173	177	184
0.26	<0.20	<0.20	0.30	0.47
<0.010	0.023	0.160	0.040	0.024
23.39	22.98	21.83	21.91	16.3
767	542.5	740	793.4	886.4
114.2	92.6	121.8	72.5	85.1
9.7	7.93	10.66	6.34	8.32
8.12	7.78	7.97	7.61	7.98

Appendix Table 1. Continued.

Parameter	Units
BOD5	mg/L
Total Dissolved Solids	mg/L
Total Suspended Solids	mg/L
Arsenic	ug/L
Cadmium	ug/L
Chromium	ug/L
Copper	ug/L
Lead	ug/L
Nickel	ug/L
Selenium	ug/L
Aluminum	ug/L
Barium	ug/L
Calcium	mg/L
Hardness, Total	mg/L
Iron	ug/L
Magnesium	mg/L
Manganese	ug/L
Potassium	mg/L
Sodium	mg/L
Strontium	ug/L
Zinc	ug/L
Mercury	ug/L
Acidity	mg/L
Alkalinity	mg/L
Ammonia	mg/L
COD	mg/L
Chloride	mg/L
Conductivity	umhos/cm
Nitrate+nitrite	mg/L
Nitrite	mg/L
Sulfate	mg/L
TKN	mg/L
Total Phosphorus	mg/L
<b>Field Measurements</b>	
Temperature	°C
Conductivity	µmhos/cm
D.O. Saturation	%
Dissolved Oxygen	mg/L
pH	S.U.

Site Location: <b>WILLIAMS FORK Off Pine Lake Road</b>					
River Mile: 0.2 Storet: 300496					
6/24/2008	7/8/2008	7/29/2008	8/14/2008	9/24/2008	
1:35 PM	12:34 PM	11:16 AM	1:21 PM	11:07 AM	
NA	NA	NA	NA	NA	
270	220	286	292	298	
<5	6	<5	6	<5	
<2.0	<2.0	<2.0	<2.0	<2.0	
<0.20	<0.20	<0.20	<0.20	<0.20	
<2.0	<2.0	<2.0	<2.0	<2.0	
<2.0	<2.0	<2.0	<2.0	<2.0	
<2.0	<2.0	<2.0	<2.0	<2.0	
<2.0	<2.0	<2.0	<2.0	<2.0	
<2.0	<2.0	<2.0	<2.0	<2.0	
<2.0	<2.0	<2.0	<2.0	<2.0	
<2.0	<2.0	<2.0	<2.0	<2.0	
<200	<200	<200	<200	<200	
51	45	57	54	59	
58	48	64	58	62	
202	169	217	207	225	
<50	149	85	128	96	
14	12	14	15	17	
26	33	40	23	18	
3	3	3	3	4	
10	8	12	14	18	
236	202	269	270	337	
<10	<10	<10	<10	<10	
<0.20	<0.20	<0.20	<0.20	<0.20	
<5.0	<5.0	<5.0	<5.0	<5.0	
127	127	182	176	167	
<0.050	<0.050	<0.050	<0.050	<0.050	
14	12	<10	15	<10	
14.1	9.0	14.2	18.9	24.3	
412	367	458	467	523	
0.11	0.26	<0.10	<0.10	<0.10	
<0.020	<0.020	<0.020	<0.020	<0.020	
56.5	44.8	49.0	51.2	45.3	
<0.20	<0.20	<0.20	<0.20	0.26	
<0.010	0.015	<0.010	0.011	0.023	
<b>Field Measurements</b>					
24.09	23.77	22.09	23.52	15.35	
435.3	385.7	454.3	479.3	535.7	
147.8	113.3	146.6	87	94	
12.41	9.57	12.78	7.38	9.39	
8.54	8.13	8.25	8.04	8.03	

Site Location: <b>WHITE EYES CREEK @ Okey Road</b>					
River Mile: 1.67 Storet: R16G08					
Dupl A/B	6/24/2008	7/8/2008	7/29/2008	8/14/2008	9/24/2008
	1:14 PM	11:35 AM	11:28 AM	1:34 PM	11:18 AM
NA	NA	NA	NA	NA	NA
232/ 230	202	260	314	384	
<5/ <5	<5	<5	5	12	
<2.0/ <2.0	<2.0	<2.0	<2.0	<2.0	
<0.20/ <0.20	<0.20	<0.20	<0.20	<0.20	
<2.0/ <2.0	<2.0	<2.0	<2.0	<2.0	
<2.0/ <2.0	<2.0	<2.0	<2.0	<2.0	
<2.0/ <2.0	<2.0	<2.0	<2.0	<2.0	
<2.0/ <2.0	<2.0	<2.0	<2.0	<2.0	
<2.0/ <2.0	<2.0	<2.0	<2.0	<2.0	
<2.0/ <2.0	<2.0	<2.0	<2.0	<2.0	
<200/ <200	<200	<200	<200	<200	
55/ 57	49	71	83	95	
56/ 58	48	61	64	78	
181/ 190	161	198	205	252	
122/ 108	125	126	278	470	
10/ 11.0	10	11	11	14	
35/ 36	25	96	296	326	
2/ 2.0	2	3	3	3	
8/ 8.0	7	12	23	43	
195/ 201	176	229	249	291	
<10/ <10	<10	<10	<10	<10	
<0.20/ <0.20	<0.20	<0.20	<0.20	<0.20	
<5.0/ <5.0	<5.0	<5.0	<5.0	<5.0	
147/ 137	130	189	192	195	
<0.050/ <0.05	<0.050	<0.050	<0.050	<0.050	
21/ 15	<10	<10	<10	<10	
9.8/ 10.0	8.1	16.0	35.3	74.3	
379 381	337	437	493	678	
0.13/ 0.12	0.17	<0.10	<0.10	<0.10	
<0.020/ <0.02	<0.020	<0.020	<0.020	<0.020	
36.1/ 36.3	29.2	32.6	202	22.6	
<0.20/ <0.20	<0.20	<0.20	<0.20	0.28	
<0.010/ <0.01	0.010	<0.010	0.014	0.015	
<b>Field Measurements</b>					
20.91	21.55	21.59	23.88	16.06	
393.5	356.4	434.6	523	689.2	
112.6	104.3	130.7	72.2	95.5	
10.05	9.19	11.51	6.09	9.4	
8.04	7.95	8.01	7.54	7.9	

Appendix Table 1. Continued.

Parameter	Units
BOD5	mg/L
Total Dissolved Solids	mg/L
Total Suspended Solids	mg/L
Arsenic	ug/L
Cadmium	ug/L
Chromium	ug/L
Copper	ug/L
Lead	ug/L
Nickel	ug/L
Selenium	ug/L
Aluminum	ug/L
Barium	ug/L
Calcium	mg/L
Hardness, Total	mg/L
Iron	ug/L
Magnesium	mg/L
Manganese	ug/L
Potassium	mg/L
Sodium	mg/L
Strontium	ug/L
Zinc	ug/L
Mercury	ug/L
Acidity	mg/L
Alkalinity	mg/L
Ammonia	mg/L
COD	mg/L
Chloride	mg/L
Conductivity	umhos/cm
Nitrate+nitrite	mg/L
Nitrite	mg/L
Sulfate	mg/L
TKN	mg/L
Total Phosphorus	mg/L
<b>Field Measurements</b>	
Temperature	°C
Conductivity	µmhos/cm
D.O. Saturation	%
Dissolved Oxygen	mg/L
pH	S.U.

Site Location: <b>LITTLE SALT CREEK @ Sanora Road</b>					
River Mile: 5.08 Storet: R16S15					
6/24/2008	7/8/2008	7/29/2008	8/14/2008	9/24/2008	
9:05 AM	1:36 PM	1:36 PM	3:54 PM	1:08 PM	
NA	NA	NA	NA	NA	
612	362	640	826	1060	
<5	7	<5	<5	5	
<2.0	<2.0	<2.0	<2.0	<2.0	
<0.20	<0.20	<0.20	<0.20	<0.20	
<2.0	<2.0	<2.0	<2.0	<2.0	
<2.0	<2.0	2.2	<2.0	<2.0	
<2.0	<2.0	<2.0	<2.0	<2.0	
2.7	4.3	3.4	3.0	3.6	
<2.0	<2.0	<2.0	<2.0	<2.0	
<200	235	<200	<200	<200	
43	36	48	55	70	
90	52	92	135	179	
373	212	386	580	789	
521	574	262	201	138	
36	20	38	59	83	
235	216	157	129	109	
3	2	4	4	6	
20	14	21	27	32	
462	223	519	888	1290	
<10	<10	<10	<10	<10	
<0.20	<0.20	<0.20	<0.20	<0.20	
<5.0	<5.0	<5.0	<5.0	<5.0	
151	110	187	231	265	
<0.050	<0.050	0.054	<0.050	<0.050	
<10	<10	<10	<10	<10	
31.6	27.3	32.9	33.2	32.7	
735	479	799	962	1390	
0.46	0.74	0.48	0.26	<0.10	
<0.020	<0.020	<0.020	<0.020	<0.020	
195	85.1	221	356	445	
0.44	<0.20	0.76	0.25	0.30	
0.026	0.023	0.013	0.021	0.012	
17.37	23.2	21.9	21.89	17.75	
779	501.7	795.6	1079.9	1432	
90.3	98.6	150.3	94.4	116.7	
8.56	8.42	13.14	8.24	11.06	
7.73	7.77	8.14	7.96	8.13	

Site Location: <b>LITTLE SALT CREEK @ Clay Pike Road (CR 5)</b>					
River Mile: 0.11 Storet: R16S02					
6/24/2008	7/8/2008	7/29/2008	8/14/2008	9/25/2008	
12:53 PM	11:23 AM	11:39 AM	1:44 PM	11:28 AM	
NA	NA	NA	NA	NA	
424	298	204	224	228	
5	10	7	9	9	
<2.0	<2.0	<2.0	<2.0	<2.0	
<0.20	<0.20	<0.20	<0.20	<0.20	
<2.0	<2.0	<2.0	<2.0	<2.0	
<2.0	<2.0	<2.0	<2.0	<2.0	
<2.0	<2.0	<2.0	<2.0	<2.0	
<2.0	2.3	<2.0	<2.0	<2.0	
<2.0	<2.0	<2.0	<2.0	<2.0	
<200	239	<200	<200	<200	
55	46	55	65	74	
62	45	40	43	46	
254	178	141	153	160	
580	713	527	665	658	
24	16	10	11	11	
128	95	165	233	306	
3	2	4	4	5	
19	16	11	14	13	
294	170	127	146	141	
<10	<10	<10	<10	<10	
<0.20	<0.20	<0.20	<0.20	<0.20	
<5.0	<5.0	5.0	<5.0	<5.0	
120	101	119	126	118	
<0.050	<0.050	0.050	<0.050	<0.050	
<10	<10	<10	13	<10	
36.3	29.9	19.5	25.4	27.3	
558	414	325	349	387	
0.45	0.82	0.46	0.20	<0.10	
<0.020	<0.020	<0.020	<0.020	<0.020	
105	58.3	27.1	30.1	24.8	
0.35	<0.20	0.44	<0.20	<0.20	
0.017	0.020	0.015	0.036	0.016	
20.1	21.36	21.66	21.9	17.75	
591.3	433.6	323.9	370.6	400	
107.2	94.8	130.6	86.9	87.6	
9.71	8.38	11.49	7.6	8.33	
7.84	7.69	7.89	7.53	7.81	

Appendix Table 1. Continued.

Parameter	Units
BOD5	mg/L
Total Dissolved Solids	mg/L
Total Suspended Solids	mg/L
Arsenic	ug/L
Cadmium	ug/L
Chromium	ug/L
Copper	ug/L
Lead	ug/L
Nickel	ug/L
Selenium	ug/L
Aluminum	ug/L
Barium	ug/L
Calcium	mg/L
Hardness, Total	mg/L
Iron	ug/L
Magnesium	mg/L
Manganese	ug/L
Potassium	mg/L
Sodium	mg/L
Strontium	ug/L
Zinc	ug/L
Mercury	ug/L
Acidity	mg/L
Alkalinity	mg/L
Ammonia	mg/L
COD	mg/L
Chloride	mg/L
Conductivity	umhos/cm
Nitrate+nitrite	mg/L
Nitrite	mg/L
Sulfate	mg/L
TKN	mg/L
Total Phosphorus	mg/L
<b>Field Measurements</b>	
Temperature	°C
Conductivity	µmhos/cm
D.O. Saturation	%
Dissolved Oxygen	mg/L
pH	S.U.

Site Location: <b>FROG RUN @ Arch Hill Road</b>					
River Mile: 0.36 Storet: R16G04					
Dupl A/B					
6/24/2008	7/8/2008	7/29/2008	8/14/2008	9/24/2008	
12:14 PM	1:22 PM	11:54 AM	2:00 PM	12:03 PM	
NA	NA	NA	NA	NA	
180	176	194/ 186	198	206	
6	17	6/ 6.0	7	<5	
<2.0	<2.0	<2.0/ <2.0	<2.0	<2.0	
<0.20	<0.20	<0.20/ <0.20	<0.20	<0.20	
<2.0	<2.0	<2.0/ <2.0	<2.0	<2.0	
<2.0	<2.0	<2.0/ <2.0	<2.0	<2.0	
<2.0	<2.0	<2.0/ <2.0	<2.0	<2.0	
<2.0	<2.0	<2.0/ <2.0	<2.0	<2.0	
<2.0	<2.0	<2.0/ <2.0	<2.0	<2.0	
<2.0	<2.0	<2.0/ <2.0	<2.0	<2.0	
293	296	<200/ <200	<200	<200	
46	41	49/ 48	43	52	
28	24	30/ 30	30	35	
111	97	120/ 120	120	141	
1010	813	777/ 738	646	504	
10	9	11/ 11.0	11	13	
122	87	95/ 93	127	88	
3	3	4/ 4.0	4	7	
9	8	9/ 9.0	11	14	
100	84	108/ 105	108	156	
<10	<10	<10/ <10	<10	<10	
<0.20	<0.20	<0.20/ <0.20	<0.20	<0.20	
<5.0	<5.0	<5.0/ <5.0	<5.0	<5.0	
70.8	62.4	96.3/ 96.6	104	108	
<0.050	<0.050	<0.050/ <0.05	<0.050	<0.050	
<10	<10	12/ <10	12	<10	
18.5	15.9	17.3/ 17.2	17.2	24.7	
265	246	285/ 283	298	364	
1.67	2.66	1.32/ 1.30	0.56	0.62	
<0.020	0.022	<0.020/ <0.02	<0.020	<0.020	
25.7	24.5	25.9/ 25.5	28.6	23.1	
0.27	0.38	0.34PT/0.38PT	0.20	0.43	
0.039	0.037	0.038/ 0.047	0.039	0.058	
19.35	21.53	20.16	20.48	16.57	
279.9	261.9	282.2	306.3	367.7	
109.4	102.4	135.8	87.1	108	
10.07	9.03	12.3	7.84	10.52	
7.71	7.77	7.94	7.7	7.97	

Site Location: <b>GEORGES RUN Adj. US40/22 (by Western shop)</b>					
River Mile: 1.63 Storet: 300497					
6/24/2008	7/8/2008	7/29/2008	8/14/2008	9/24/2008	
11:30 AM	12:56 PM	12:22 PM	2:44 PM	11:44 PM	
NA	NA	NA	NA	NA	
288	270	308	274	240	
103	8	<5	<5	20	
<2.0	<2.0	<2.0	<2.0	<2.0	
<0.20	<0.20	<0.20	<0.20	<0.20	
<2.0	<2.0	<2.0	<2.0	<2.0	
3.8	<2.0	<2.0	<2.0	<2.0	
2.9	<2.0	<2.0	<2.0	<2.0	
4.6	2.2	<2.0	<2.0	<2.0	
<2.0	<2.0	<2.0	<2.0	<2.0	
1840	348	<200	<200	291	
65	50	61	49	49	
56	56	64	50	45	
189	189	213	174	166	
2550	539	140	159	595	
12	12	13	12	13	
144	58	70	100	126	
3	2	2	2	3	
22	21	22	21	20	
220	221	240	184	187	
<10	<10	<10	<10	<10	
<0.20	<0.20	<0.20	<0.20	<0.20	
<5.0	<5.0	<5.0	<5.0	<5.0	
126	143	177	147	127	
<0.050	<0.050	<0.050	<0.050	<0.050	
11	<10	14	17	<10	
37.3	34.0	40.9	36.5	36.3	
430	448	502	415	416	
0.41	0.27	<0.10	<0.10	<0.10	
<0.020	<0.020	<0.020	<0.020	<0.020	
34.9	35.4	37.6	30.6	21.6	
<0.20	0.33	<0.20	<0.20	<0.20	
0.060	0.015	<0.010	0.017	0.038	
19.91	23.58	21.85	23	16.44	
454.1	472.5	498.7	440.8	422.2	
113.8	102.2	<b>137.4</b>	90.1	98	
10.35	8.66	12.03	7.72	9.57	
7.94	7.94	8.05	7.79	7.93	

Appendix Table 2. Salt Creek bacteriological sampling results for 2008.

Date	Bacteria	Salt Creek @ Bethel Road Storet # R16G91 RM 25.7	Salt Creek @ Leachman Road Storet # 300491 RM 24.95
6/25/2008	E.coli	1500JL	13000JL
	Fecal Coliform	1600J,JL	13000JL
7/9/2008	E.coli	2900	16000JL
	Fecal Coliform	6500JL	24000J
8/7/2008	E.coli	800J,JL	5200
	Fecal Coliform	500J,JL	10000JL
8/20/2008	E.coli	340	8300JL
	Fecal Coliform	400J,JL	9500JL
8/28/2008	E.coli	700J,JL	54000
	Fecal Coliform	11000J,JL	60000E
9/2/2008	E.coli	700J,JL	NA
	Fecal Coliform	400	NA
9/8/2008	E.coli	400J,JL	2500
	Fecal Coliform	7000J,JL	3600
10/2/2008	E.coli	150JL	1000JL
	Fecal Coliform	190JL	950JL

Date	Bacteria	Salt Creek @ Knipe Road Storet # R16G01 RM 23.43	Salt Creek @ Norfield Rd Storet # 300490 RM 18.3
6/25/2008	E.coli	750	270
	Fecal Coliform	1200JL	330
7/9/2008	E.coli	7300	11000JL
	Fecal Coliform	J,JL	28000J
8/7/2008	E.coli	310J	480
	Fecal Coliform	1600JL	510
8/20/2008	E.coli	170JL	200
	Fecal Coliform	410	760JL
8/28/2008	E.coli	5800	1400JL
	Fecal Coliform	12000JL	2100
9/2/2008	E.coli	820JL	670
	Fecal Coliform	1000JL	1000JL
9/8/2008	E.coli	170JL	430
	Fecal Coliform	440	590
10/2/2008	E.coli	220	420
	Fecal Coliform	500	470

Date	Bacteria	Salt Creek @ US Rt. 40 Storet # R16G03 RM 12.91	Salt Creek adj Manns Fork Road Storet # 300488 RM 1.1
6/25/2008	E.coli	390	170JL
	Fecal Coliform	480	290
7/9/2008	E.coli	22000	4900
	Fecal Coliform	11000J,JL	10000J,JL
8/7/2008	E.coli	NA	50JL
	Fecal Coliform	NA	50JL
8/20/2008	E.coli	110JL	10JL
	Fecal Coliform	370	40JL
8/28/2008	E.coli	1800JL	2700
	Fecal Coliform	3700	4100
9/2/2008	E.coli	420	NA
	Fecal Coliform	800JL	NA
9/8/2008	E.coli	240	10JL
	Fecal Coliform	760JL	50JL
10/2/2008	E.coli	110JL	270
	Fecal Coliform	380	210



Appendix Table 2 continued.

Date	Bacteria	Salt Creek @ SR 146 Storet # R16G23 RM 5.6
6/25/2008	E.coli	100JL*
	Fecal Coliform	340*
	E.coli	110JL**
	Fecal Coliform	260**
7/9/2008	E.coli	18000JL*
	Fecal Coliform	41000*
	E.coli	24000**
	Fecal Coliform	31000**
8/7/2008	E.coli	90JL*
	Fecal Coliform	170JL*
	E.coli	110JL**
	Fecal Coliform	180JL**
8/20/2008	E.coli	10JL*
	Fecal Coliform	200*
	E.coli	130JL**
	Fecal Coliform	140JL**
8/28/2008	E.coli	5800*
	Fecal Coliform	7300JL*
	E.coli	3900**
	Fecal Coliform	7800JL**
9/2/2008	E.coli	150JL
	Fecal Coliform	130JL
9/8/2008	E.coli	30JL
	Fecal Coliform	60JL
10/2/2008	E.coli	70JL
	Fecal Coliform	40JL

Date	Bacteria	Prairie Fork @ mouth Storet #300492 RM 0.1	Georges Run Adj US 40/22 Storet # 300497 RM 1.63
6/25/2008	E.coli	500	770
	Fecal Coliform	1100JL	1200JL
7/9/2008	E.coli	15000JL	1300JL
	Fecal Coliform	16000JL	2200
8/7/2008	E.coli	1500JL	470
	Fecal Coliform	2000	540
8/20/2008	E.coli	230	530
	Fecal Coliform	530	780JL
8/28/2008	E.coli	4000	1200JL
	Fecal Coliform	5800	2100

Date	Bacteria	Frog Run @ Arch Hill Road Storet # R16G04 RM 0.36	Little Salt Creek @ Sanora Road Storet # R16S15 RM 5.08
6/25/2008	E.coli	580	310
	Fecal Coliform	820JL	460
7/9/2008	E.coli	48000	4700
	Fecal Coliform	61000JL	8900JL
8/7/2008	E.coli	450	130JL
	Fecal Coliform	820JL	260
8/20/2008	E.coli	870JL	30JL
	Fecal Coliform	2500	150JL
8/28/2008	E.coli	1000JL	2000
	Fecal Coliform	4800	3600

Appendix Table 2 continued.

Date	Bacteria	Little Salt Creek @ Caly Pike Storet # R16S02 RM 0.11	Buffalo Fk. @ Okey Road Storet #R16G11 Rm 2.13
6/25/2008	E.coli	590	330*
	Fecal Coliform	630JL	420*
	E.coli	NA	330**
	Fecal Coliform	NA	390**
7/9/2008	E.coli	5300	2800
	Fecal Coliform	11000JL	3500J
8/7/2008	E.coli	560	50JL*
	Fecal Coliform	570	200*
	E.coli	NA	20JL**
	Fecal Coliform	NA	150JL**
8/20/2008	E.coli	120JL	50JL
	Fecal Coliform	210	80JL
8/28/2008	E.coli	5300	28000
	Fecal Coliform	16000JL	25000J
9/2/2008	E.coli	290	140JL
	Fecal Coliform	400	340
9/8/2008	E.coli	210	30JL
	Fecal Coliform	560	180JL
10/2/2008	E.coli	180JL	20JL
	Fecal Coliform	170JL	40JL

Date	Bacteria	Buffalo Fork @ Leedom Road Storet # R16G12 RM 6.55	White Eyes Creek @ Okey Road Storet # R16G08 RM 1.67
6/25/2008	E.coli	160JL	130JL
	Fecal Coliform	220	230
7/9/2008	E.coli	1700JL	3500
	Fecal Coliform	1600JL	NA
8/7/2008	E.coli	70JL	180JL
	Fecal Coliform	260	200
8/20/2008	E.coli	<10	90JL
	Fecal Coliform	40JL	270
8/28/2008	E.coli	180JL	390
	Fecal Coliform	390	740JL

Date	Bacteria	Buffalo Fork at farm lane off SR 146 Storet # 300495 RM 0.1	Williams Fork off Pine Lake Road Storet # 300496 RM 0.2
6/25/2008	E.coli	240	200
	Fecal Coliform	280	380
7/9/2008	E.coli	4100	3700
	Fecal Coliform	4200	12000J,JL
8/7/2008	E.coli	160JL	160JL
	Fecal Coliform	430	260
8/20/2008	E.coli	100JL	470
	Fecal Coliform	190JL	1000JL
8/28/2008	E.coli	5500*	490
	Fecal Coliform	12000J,JL*	910JL
	E.coli	7100**	NA
	Fecal Coliform	9000J,JL**	NA

Date	Bacteria	Boggs Creek @ SR 146 Storet # R16G17 RM 4.04	Boggs Creek @ Salt Creek Drive Storet # R16G15 RM 0.9
6/25/2008	E.coli	2900	NA
	Fecal Coliform	3900J	NA
7/9/2008	E.coli	3500	7000
	Fecal Coliform	6800JL	15000JL
8/7/2008	E.coli	1500JL	760
	Fecal Coliform	2100	1200JL
8/20/2008	E.coli	330	100JL
	Fecal Coliform	570	230
8/28/2008	E.coli	1300JL	3500
	Fecal Coliform	2200	6100JL

Appendix Table 2 continued.

Date	Bacteria	Manns Fork @ Cutler Lake Road Storet #201242 RM 4.2	Manns Fork @ Mock Drive Storet # R16G20 RM 2.31
6/25/2008	E.coli	110JL	70JL
	Fecal Coliform	120JL	220
7/9/2008	E.coli	320	1600JL
	Fecal Coliform	500J,JL	4000J,JL
8/7/2008	E.coli	120JL	NA
	Fecal Coliform	160JL	NA
8/20/2008	E.coli	40JL	320
	<b>Fecal Coliform</b>	60JL	310
8/28/2008	E.coli	310	540
	Fecal Coliform	630JL	840JL
Date	Bacteria	UT Manns Fork @ RM 2.3 Storet # 300493 RM 0.1	Kent Run @ Browning Road Storet #300494 RM 0.6
6/25/2008	E.coli	40JL	40JL
	Fecal Coliform	320	80JL
7/9/2008	E.coli	810JL	1100JL
	Fecal Coliform	2900	2200
8/7/2008	E.coli	NA	10JL
	Fecal Coliform	NA	<10
8/20/2008	E.coli	<10*	10JL
	Fecal Coliform	90JL*	40JL
	E.coli	10JL**	NA
	Fecal Coliform	100JL**	NA
8/28/2008	E.coli	560	120JL
	Fecal Coliform	1700JL	710JL

\* Denotes Duplicate Sample A

\*\*Denotes Duplicate Sample B

J The analyte was positively identified, the associated numerical value is estimated.

UJ The analyte was not detected above the sample quantitation limit (QL). However, the reported QL is estimated.

Appendix Table 3. Hourly measurements of dissolved oxygen, pH, temperature, and conductivity at stream locations in the Salt Creek study area using Datasonde© continuous recorders, 2008.

SALT CREEK - RM 5.6											
STORET: R15G23											
Date	Time	Temp.	pH	Spec.Conduct.	D.O.	Date	Time	Temp.	pH	Spec.Conduct.	D.O.
M/DD/YEAR	HHMM	°C	SU	mS/cm	mg/l	M/DD/YEAR	HHMM	°C	SU	mS/cm	mg/l
7/8/2008	17:00	22.99	7.63	0.3	8.31	8/19/2008	13:00	23.63	7.77	0.483	9.23
7/8/2008	18:00	23.13	7.65	0.3	8.26	8/19/2008	14:00	23.95	7.82	0.483	9.36
7/8/2008	19:00	22.89	7.64	0.3	8.16	8/19/2008	15:00	22.94	7.79	0.483	8.98
7/8/2008	20:00	22.41	7.63	0.28	8.17	8/19/2008	16:00	23.1	7.8	0.482	9.06
7/8/2008	21:00	21.98	7.62	0.25	8.09	8/19/2008	17:00	23.16	7.79	0.482	8.86
7/8/2008	22:00	21.71	7.58	0.24	7.92	8/19/2008	18:00	23.42	7.78	0.482	8.71
7/8/2008	23:00	21.44	7.52	0.16	7.88	8/19/2008	19:00	23.68	7.78	0.481	8.55
7/9/2008	0:00	21.28	7.53	0.22	7.93	8/19/2008	20:00	23.64	7.75	0.481	8.31
7/9/2008	1:00	21.19	7.54	0.23	7.91	8/19/2008	21:00	23.38	7.73	0.481	8.04
7/9/2008	2:00	21.08	7.56	0.22	7.95	8/19/2008	22:00	23.14	7.71	0.481	7.81
7/9/2008	3:00	20.95	7.51	0.23	7.92	8/19/2008	23:00	22.89	7.69	0.48	7.64
7/9/2008	4:00	20.77	7.51	0.12	7.61	8/20/2008	0:00	22.55	7.66	0.481	7.47
7/9/2008	5:00	20.64	7.47	0.17	7.87	8/20/2008	1:00	22.22	7.65	0.481	7.38
7/9/2008	6:00	20.62	7.32	0.17	7.99	8/20/2008	2:00	21.85	7.64	0.481	7.31
						8/20/2008	3:00	21.48	7.63	0.481	7.24
						8/20/2008	4:00	21.14	7.62	0.482	7.16
						8/20/2008	5:00	20.78	7.61	0.482	7.11
						8/20/2008	6:00	20.45	7.6	0.482	7.07
						8/20/2008	7:00	20.12	7.59	0.483	7.02
						8/20/2008	8:00	19.98	7.58	0.483	7.07
						8/20/2008	9:00	20.09	7.61	0.484	7.24
						8/20/2008	10:00	20.52	7.64	0.485	7.66
						8/20/2008	11:00	21.42	7.69	0.486	8.24
						8/20/2008	12:00	22.73	7.74	0.485	8.77
						8/20/2008	13:00	23.9	7.79	0.486	9.14
						8/20/2008	14:00	23.8	7.8	0.486	9.22
						8/20/2008	15:00	23.47	7.8	0.486	9.12
						8/20/2008	16:00	23.36	7.8	0.485	9.08
						8/20/2008	17:00	23.4	7.8	0.485	8.99
						8/20/2008	18:00	23.56	7.8	0.485	8.8
						8/20/2008	19:00	23.71	7.78	0.485	8.57
						8/20/2008	20:00	23.58	7.75	0.485	8.28
						8/20/2008	21:00	23.17	7.72	0.485	8
						8/20/2008	22:00	22.76	7.7	0.485	7.8
						8/20/2008	23:00	22.43	7.68	0.485	7.63
						8/21/2008	0:00	22.08	7.66	0.485	7.51
						8/21/2008	1:00	21.76	7.65	0.485	7.42
						8/21/2008	2:00	21.41	7.63	0.484	7.34
						8/21/2008	3:00	21.09	7.62	0.484	7.28
						8/21/2008	4:00	20.78	7.61	0.484	7.23
						8/21/2008	5:00	20.47	7.6	0.484	7.19
						8/21/2008	6:00	20.18	7.59	0.484	7.12
						8/21/2008	7:00	19.9	7.58	0.484	7.07
						8/21/2008	8:00	19.82	7.58	0.485	7.15
						8/21/2008	9:00	19.94	7.6	0.485	7.41
						8/21/2008	10:00	20.5	7.63	0.485	7.86
						8/21/2008	11:00	21.6	7.7	0.486	8.54
						8/21/2008	12:00	22.9	7.75	0.486	9.08
						8/21/2008	13:00	23.9	7.81	0.486	9.5

Appendix Table 3 continued.

SALT CREEK - RM 1.1											
STORET: 300488											
Date	Time	Temp.	pH	Spec.Conduct.	D.O.	Date	Time	Temp.	pH	Spec.Conduct.	D.O.
M/DD/YEAR	HHMM	°C	SU	mS/cm	mg/l	M/DD/YEAR	HHMM	°C	SU	mS/cm	mg/l
7/8/2008	16:00	23.6	7.64	0.33	7.99	8/19/2008	12:00	21.75	7.58	0.577	7.71
7/8/2008	17:00	23.82	7.66	0.33	7.95	8/19/2008	13:00	22.61	7.63	0.577	8.32
7/8/2008	18:00	23.93	7.67	0.34	7.9	8/19/2008	14:00	23.48	7.68	0.578	8.77
7/8/2008	19:00	23.98	7.67	0.33	7.86	8/19/2008	15:00	24.19	7.71	0.578	8.95
7/8/2008	20:00	23.85	7.68	0.33	7.81	8/19/2008	16:00	24.49	7.74	0.578	9.18
7/8/2008	21:00	23.53	7.66	0.33	7.72	8/19/2008	17:00	24.7	7.74	0.579	9.25
7/8/2008	22:00	23.08	7.63	0.32	7.59	8/19/2008	18:00	24.73	7.75	0.579	9.29
7/8/2008	23:00	22.4	7.56	0.29	7.52	8/19/2008	19:00	24.43	7.74	0.579	9.06
7/9/2008	0:00	22.18	7.48	0.19	7.33	8/19/2008	20:00	24.18	7.71	0.58	8.74
7/9/2008	1:00	21.48	7.52	0.21	7.33	8/19/2008	21:00	23.91	7.65	0.579	8.4
7/9/2008	2:00	21.25	7.57	0.25	7.47	8/19/2008	22:00	23.65	7.65	0.579	8.17
7/9/2008	3:00	21.1	7.58	0.23	7.59	8/19/2008	23:00	23.38	7.63	0.578	8.07
7/9/2008	4:00	20.99	7.55	0.22	7.66	8/20/2008	0:00	23.18	7.62	0.578	7.91
7/9/2008	5:00	20.86	7.56	0.22	7.74	8/20/2008	1:00	22.93	7.6	0.578	7.72
7/9/2008	6:00	20.73	7.56	0.22	7.77	8/20/2008	2:00	22.64	7.59	0.578	7.65
7/9/2008	7:00	20.64	7.57	0.22	7.8	8/20/2008	3:00	22.37	7.57	0.578	7.5
7/9/2008	8:00	20.55	7.56	0.22	7.81	8/20/2008	4:00	22.11	7.55	0.578	7.35
7/9/2008	9:00	20.51	7.58	0.23	7.86	8/20/2008	5:00	21.88	7.54	0.577	7.2
7/9/2008	10:00	20.51	7.58	0.23	7.86	8/20/2008	6:00	21.64	7.53	0.577	7.08
7/9/2008	11:00	20.53	7.59	0.24	7.89	8/20/2008	7:00	21.39	7.51	0.576	6.91
7/9/2008	12:00	20.61	7.6	0.24	7.94	8/20/2008	8:00	21.19	7.48	0.575	6.83
7/9/2008	13:00	20.86	7.61	0.24	7.95	8/20/2008	9:00	21.15	7.5	0.575	6.93
7/9/2008	14:00	21.25	7.62	0.25	7.95	8/20/2008	10:00	21.14	7.49	0.575	6.96
7/9/2008	15:00	21.59	7.62	0.25	7.96	8/20/2008	11:00	21.24	7.51	0.575	7.14
7/9/2008	16:00	21.86	7.63	0.25	7.93	8/20/2008	12:00	21.73	7.55	0.575	7.57
7/9/2008	17:00	22.13	7.63	0.25	7.91	8/20/2008	13:00	23.4	7.67	0.571	8.11
7/9/2008	18:00	22.31	7.63	0.25	7.9	8/20/2008	14:00	23.99	7.67	0.576	8.57
7/9/2008	19:00	22.36	7.64	0.26	7.86	8/20/2008	15:00	25.05	7.74	0.572	9.18
7/9/2008	20:00	22.37	7.63	0.26	7.82	8/20/2008	16:00	25.1	7.7	0.575	9.2
7/9/2008	21:00	22.38	7.63	0.26	7.79	8/20/2008	17:00	25.43	7.71	0.576	9.19
7/9/2008	22:00	22.34	7.62	0.26	7.73	8/20/2008	18:00	25.48	7.7	0.577	9.09
7/9/2008	23:00	22.26	7.62	0.26	7.7	8/20/2008	19:00	25.03	7.69	0.577	8.77
7/10/2008	0:00	22.15	7.61	0.26	7.66	8/20/2008	20:00	24.5	7.67	0.577	8.4
7/10/2008	1:00	22	7.61	0.26	7.64	8/20/2008	21:00	23.94	7.64	0.576	8.12
7/10/2008	2:00	21.84	7.6	0.26	7.64	8/20/2008	22:00	23.53	7.6	0.576	7.95
7/10/2008	3:00	21.66	7.6	0.26	7.65	8/20/2008	23:00	23.21	7.57	0.575	7.77
7/10/2008	4:00	21.46	7.6	0.26	7.66	8/21/2008	0:00	22.92	7.56	0.575	7.56
7/10/2008	5:00	21.25	7.59	0.26	7.67	8/21/2008	1:00	22.66	7.52	0.575	7.42
7/10/2008	6:00	21.02	7.59	0.26	7.69	8/21/2008	2:00	22.4	7.5	0.574	7.23
7/10/2008	7:00	20.79	7.59	0.26	7.74	8/21/2008	3:00	22.15	7.5	0.574	7.05
7/10/2008	8:00	20.57	7.59	0.27	7.78	8/21/2008	4:00	21.91	7.49	0.573	6.92
7/10/2008	9:00	20.37	7.6	0.27	7.83	8/21/2008	5:00	21.66	7.44	0.573	6.98
7/10/2008	10:00	20.2	7.59	0.27	7.88	8/21/2008	6:00	21.43	7.47	0.573	6.87
7/10/2008	11:00	20.13	7.59	0.27	7.93	8/21/2008	7:00	21.23	7.45	0.572	6.74
						8/21/2008	8:00	21.08	7.41	0.572	6.87
						8/21/2008	9:00	21.05	7.46	0.571	6.89
						8/21/2008	10:00	21.11	7.46	0.571	6.99
						8/21/2008	11:00	21.36	7.49	0.571	7.28

Appendix Table 3 Continued.

BUFFALO FORK - RM 2.13											
STORET: R16G11											
Date	Time	Temp.	pH	Spec.Conduct.	D.O.	Date	Time	Temp.	pH	Spec.Conduct.	D.O.
M/DD/YEAR	HHMM	°C	SU	mS/cm	mg/l	M/DD/YEAR	HHMM	°C	SU	mS/cm	mg/l
7/8/2008	17:00	23.74	7.93	0.538	9.01	8/19/2008	13:00	24.28	7.85	0.911	8.78
7/8/2008	18:00	24.04	7.93	0.541	8.66	8/19/2008	14:00	25.22	7.88	0.913	8.84
7/8/2008	19:00	24.15	7.93	0.538	8.47	8/19/2008	15:00	24.94	7.88	0.919	8.26
7/8/2008	20:00	23.39	7.37	0.885	7.78	8/19/2008	16:00	25.14	7.9	0.921	8.18
7/8/2008	21:00	22.97	7.75	0.418	8.01	8/19/2008	17:00	25.25	7.92	0.92	8.02
7/8/2008	22:00	21.5	7.56	0.125	7.67	8/19/2008	18:00	25.15	7.91	0.925	7.58
7/8/2008	23:00	21.24	7.62	0.324	7.78	8/19/2008	19:00	24.95	7.9	0.927	7.51
7/9/2008	0:00	21.02	7.61	0.296	7.84	8/19/2008	20:00	24.72	7.89	0.928	7.27
7/9/2008	1:00	20.79	7.58	0.293	7.92	8/19/2008	21:00	24.31	7.88	0.927	7.17
7/9/2008	2:00	20.57	7.6	0.307	8	8/19/2008	22:00	23.96	7.87	0.925	7.07
7/9/2008	3:00	20.37	7.63	0.313	8.07	8/19/2008	23:00	23.6	7.86	0.925	7.04
7/9/2008	4:00	20.24	7.61	0.306	8.09	8/20/2008	0:00	23.21	7.86	0.925	6.95
7/9/2008	5:00	20.11	7.63	0.326	8.11	8/20/2008	1:00	22.78	7.86	0.924	6.8
7/9/2008	6:00	20.01	7.64	0.343	8.12	8/20/2008	2:00	22.35	7.86	0.923	6.8
7/9/2008	7:00	19.93	7.66	0.353	8.14	8/20/2008	3:00	21.94	7.85	0.923	6.65
7/9/2008	8:00	19.89	7.67	0.363	8.16	8/20/2008	4:00	21.52	7.87	0.922	6.86
7/9/2008	9:00	19.89	7.69	0.37	8.18	8/20/2008	5:00	21.16	7.85	0.921	6.88
7/9/2008	10:00	20.02	7.7	0.376	8.22	8/20/2008	6:00	20.47	7.91	0.919	6.96
7/9/2008	11:00	20.15	7.72	0.383	8.27	8/20/2008	7:00	19.81	7.88	0.918	7.03
7/9/2008	12:00	20.49	7.73	0.389	8.29	8/20/2008	8:00	19.83	7.89	0.927	7.06
7/9/2008	13:00	20.88	7.75	0.396	8.34	8/20/2008	9:00	20.27	7.88	0.923	7.35
7/9/2008	14:00	21.44	7.76	0.401	8.3	8/20/2008	10:00	20.91	7.97	0.92	7.75
7/9/2008	15:00	21.98	7.77	0.406	8.31	8/20/2008	11:00	22.2	7.85	0.921	8.19
7/9/2008	16:00	22.32	7.78	0.411	8.24	8/20/2008	12:00	23.56	7.9	0.917	8.93
7/9/2008	17:00	22.62	7.79	0.416	8.14	8/20/2008	13:00	24.66	7.92	0.918	9.24
7/9/2008	18:00	22.72	7.8	0.421	8.07	8/20/2008	14:00	25.73	7.93	0.915	9.11
7/9/2008	19:00	22.79	7.8	0.425	8.04	8/20/2008	15:00	25.24	7.92	0.917	8.88
7/9/2008	20:00	22.71	7.8	0.43	7.98	8/20/2008	16:00	25.31	7.92	0.916	8.48
7/9/2008	21:00	22.5	7.8	0.435	7.92	8/20/2008	17:00	24.9	7.91	0.922	8.04
7/9/2008	22:00	22.19	7.79	0.439	7.9	8/20/2008	18:00	24.71	7.91	0.921	7.74
7/9/2008	23:00	21.86	7.79	0.442	7.88	8/20/2008	19:00	24.25	7.89	0.926	7.29
7/10/2008	0:00	21.53	7.79	0.446	7.89	8/20/2008	20:00	23.68	7.9	0.928	6.99
7/10/2008	1:00	21.19	7.79	0.452	7.93	8/20/2008	21:00	23.08	7.89	0.924	7.27
7/10/2008	2:00	20.85	7.78	0.456	7.96	8/20/2008	22:00	22.44	7.92	0.924	7.23
7/10/2008	3:00	20.52	7.78	0.46	8.03	8/20/2008	23:00	21.94	7.93	0.923	7.21
7/10/2008	4:00	20.2	7.78	0.464	8.08	8/21/2008	0:00	21.56	7.93	0.923	7.12
7/10/2008	5:00	19.88	7.78	0.465	8.14	8/21/2008	1:00	21.14	7.92	0.922	7.07
7/10/2008	6:00	19.58	7.78	0.465	8.2	8/21/2008	2:00	20.84	7.93	0.922	6.66
7/10/2008	7:00	19.32	7.78	0.466	8.28	8/21/2008	3:00	20.44	7.93	0.922	7.18
7/10/2008	8:00	19.09	7.8	0.465	8.41	8/21/2008	4:00	20.16	7.94	0.921	7.08
7/10/2008	9:00	19.06	7.81	0.467	8.54	8/21/2008	5:00	19.93	7.92	0.926	7.22
7/10/2008	10:00	19.23	7.82	0.469	8.68	8/21/2008	6:00	19.67	7.88	0.928	7.03
7/10/2008	11:00	19.55	7.83	0.471	8.8	8/21/2008	7:00	19.74	8.01	0.925	7.11
7/10/2008	12:00	19.98	7.82	0.474	8.91	8/21/2008	8:00	19.71	7.93	0.925	7.45
7/10/2008	13:00	20.57	7.86	0.476	8.93	8/21/2008	9:00	20.27	7.98	0.924	7.26
						8/21/2008	10:00	21.24	8.03	0.921	7.77
						8/21/2008	11:00	22.85	7.91	0.917	8.42
						8/21/2008	12:00	24.12	7.96	0.918	8.76

Appendix Table 4. Sediment sampling results for semivolatile organic compounds, pesticides, and PCBs from the Salt Creek (Muskingum River) study area, 2008.

<b>Stream</b>	<b>SALT CREEK</b>	<b>BUFFALO FORK</b>
River Mile	<b>5.6</b>	<b>2.13</b>
STORET Number	R16G23	R16G11
Date Sampled	7/28/2008	7/28/2008
Time Sampled	10:45 AM	9:45 AM
<b>Semivolatile Organic Compounds (mg/kg)</b>		
Acenaphthene	<0.62	<0.56
Acenaphthylene	<0.62	<0.56
Acetophenone	<0.62	<0.56
2-Acetylaminofluorene	<0.62	<0.56
Aniline	<3.1	<2.8
Anthracene	<0.62	<0.56
Benz[a]anthracene	<0.62	<0.56
Benzo[a]pyrene	<0.62	<0.56
Benzo[b]fluoranthene	<0.62	<0.56
Benzo[g,h,i]perylene	<0.62	<0.56
Benzo[k]fluoranthene	<0.62	<0.56
Benzyl alcohol	<0.62	<0.56
bis(2-Chloroethoxy)methane	<0.62	<0.56
bis(2-Chloroethyl)ether	<0.62	<0.56
bis(2-Chloroisopropyl)ether	<0.62	<0.56
bis(2-Ethylhexyl)phthalate	<0.62	<0.56
4-Bromophenyl-phenylether	<0.62	<0.56
Butylbenzylphthalate	<0.62	<0.56
4-Chloro-3-methylphenol	<0.62	<0.56
2-Chloronaphthalene	<0.62	<0.56
2-Chlorophenol	<0.62	<0.56
4-Chlorophenyl-phenylether	<0.62	<0.56
Chrysene	<0.62	<0.56
Di-n-butylphthalate	<0.62	<0.56
Di-n-octylphthalate	<0.62	<0.56
Dibenz[a,h]anthracene	<0.62	<0.56
Dibenzofuran	<0.62	<0.56
1,3-Dichlorobenzene	<0.62	<0.56
1,4-Dichlorobenzene	<0.62	<0.56
1,2-Dichlorobenzene	<0.62	<0.56
3,3'-Dichlorobenzidine	<3.1	<2.8
2,6-Dichlorophenol	<0.62	<0.56
2,4-Dichlorophenol	<0.62	<0.56
Diethylphthalate	<0.62	<0.56
p-Dimethylaminoazobenzene	<0.62	<0.56
7,12-Dimethylbenz[a]anthracene	<3.1	<2.8
2,4-Dimethylphenol	<0.62	<0.56
Dimethylphthalate	<0.62	<0.56
4,6-Dinitro-2-methylphenol	<0.62	<0.56
1,3-Dinitrobenzene	<0.62	<0.56
2,4-Dinitrophenol	<3.1	<2.8
2,6-Dinitrotoluene	<0.62	<0.56
2,4-Dinitrotoluene	<0.62	<0.56
Dinoseb	<0.62	<0.56
Diphenylamine	<0.62	<0.56
Ethyl methanesulfonate	<0.62	<0.56

Appendix Table 4 continued.

<b>Stream</b>	<b>SALT CREEK</b>	<b>BUFFALO FORK</b>
River Mile	<b>5.6</b>	<b>2.13</b>
STORET Number	R16G23	R16G11
Date Sampled	7/28/2008	7/28/2008
Time Sampled	10:45 AM	9:45 AM
<b>Semivolatile Organic Compounds (mg/kg)</b>		
Fluoranthene	<0.62	<0.56
Fluorene	<0.62	<0.56
Hexachlorobenzene	<0.62	<0.56
Hexachlorobutadiene	<0.62	<0.56
Hexachlorocyclopentadiene	<0.62	<0.56
Hexachloroethane	<0.62	<0.56
Hexachloropropene	<0.62	<0.56
Indeno[1,2,3-cd]pyrene	<0.62	<0.56
Isophorone	<0.62	<0.56
Methyl methanesulfonate	<0.62	<0.56
3-Methylcholanthrene	<0.62	<0.56
2-Methylnaphthalene	<0.62	<0.56
3&4-Methylphenol	<0.62	<0.56
2-Methylphenol	<0.62	<0.56
N-Nitroso-di-n-butylamine	<0.62	<0.56
N-Nitroso-di-n-propylamine	<0.62	<0.56
N-Nitrosomorpholine	<0.62	<0.56
N-Nitrosopiperidine	<0.62	<0.56
N-Nitrosopyrrolidine	<0.62	<0.56
Naphthalene	<0.62	<0.56
1,4-Naphthoquinone	<0.62	<0.56
2-Nitroaniline	<0.62	<0.56
4-Nitroaniline	<0.62	<0.56
Nitrobenzene	<0.62	<0.56
4-Nitrophenol	<3.1	<2.8
2-Nitrophenol	<0.62	<0.56
Pentachlorobenzene	<0.62	<0.56
Pentachlorophenol	<0.62 R	<0.56 R
Phenacetin	<0.62	<0.56
Phenanthrene	<0.62	<0.56
Phenol	<0.62	<0.56
2-Picoline	<0.62	<0.56
Pronamide	<0.62	<0.56
Pyrene	<0.62	<0.56
Safrole	<0.62	<0.56
1,2,4,5-Tetrachlorobenzene	<0.62	<0.56
2,3,4,6-Tetrachlorophenol	<0.62	<0.56
1,2,4-Trichlorobenzene	<0.62	<0.56
2,4,6-Trichlorophenol	<0.62	<0.56
2,4,5-Trichlorophenol	<0.62	<0.56



Appendix Table 4 continued.

<b>Stream</b>	<b>SALT CREEK</b>	<b>BUFFALO FORK</b>
River Mile	<b>5.6</b>	<b>2.13</b>
STORET Number	R16G23	R16G11
Date Sampled	7/28/2008	7/28/2008
Time Sampled	10:45 AM	9:45 AM
<b>Pesticides (ug/kg)</b>		
Aldrin	<6.2	<5.7
a-BHC	<6.2	<5.7
b-BHC	<6.2	<5.7
d-BHC	<6.2	<5.7
y-BHC	<6.2	<5.7
4,4'-DDD	<6.2	<5.7
4,4'-DDE	<6.2	<5.7
4,4'-DDT	<6.2	<5.7
Dieldrin	<6.2	<5.7
Endosulfan I	<6.2	<5.7
Endosulfan II	<6.2	<5.7
Endosulfan sulfate	<6.2	<5.7
Endrin	<6.2	<5.7
Endrin aldehyde	<6.2	<5.7
Heptachlor	<6.2	<5.7
Heptachlor epoxide	<6.2	<5.7
Methoxychlor	<6.2	<5.7
Mirex	<6.2	<5.7
Hexachlorobenzene	<6.2	<5.7
<b>PCBs (ug/kg)</b>		
PCB-1016	<31.2	<28.6
PCB-1221	<31.2	<28.6
PCB-1232	<31.2	<28.6
PCB-1242	<31.2	<28.6
PCB-1248	<31.2	<28.6
PCB-1254	<31.2	<28.6
PCB-1260	<31.2	<28.6

< - Not detected at or above the method detection limit (MDL value reported with the less than symbol).

R - The analyte result is unusable because quality control criteria was not met.

Appendix Table 4 continued.

<b>Stream</b>	<b>SALT CREEK</b>	<b>BUFFALO FORK</b>
River Mile	<b>5.6</b>	<b>2.13</b>
STORET Number	R16G23	R16G11
Date Sampled	7/28/2008	7/28/2008
Time Sampled	10:45 AM	9:45 AM
<b>Metals (mg/kg)</b>		
Arsenic	4.85	8.23
Cadmium	0.150	0.140
Chromium	11.9 J	14.7 J
Copper	11.3 J	13.7 J
Lead	12.0	15.4
Nickel	15.2 J	18.3 J
Selenium	<0.97	<1.00
Aluminum	6720	7490
Barium	72.9	77.0
Calcium	1960	2460
Iron	19900	33000
Magnesium	1830	2180
Manganese	653	644
Potassium	<973	<998
Sodium	<2430	<2490
Strontium	<15	27
Zinc	52.4	55.7
Mercury	<0.030	<0.031
<b>Other</b>		
Ammonia (mg/kg)	70	55
Phosphorus - Total (mg/kg)	384	420
Percent Solids	66.3	72.9
Total Organic Carbon (%)	1.3	0.8

J - results estimated due to either elevated spike recovery and poor correlation between lab duplicates (phosphorus), or due to matrix interference.

**Appendix Table 5.** Surface water results for semivolatile organic compounds, herbicides, and pesticides from two sites in the Salt Creek study area, 2008.

<b>Stream</b>	<b>SALT CREEK</b>	<b>BUFFALO FORK</b>
River Mile	<b>5.6</b>	<b>2.13</b>
STORET Number	R16G23	R16G11
Date Sampled	6/10/2008	6/10/2008
Time Sampled	11:20 AM	11:00 AM
<b>Semivolatile Organic Compounds (ug/l)</b>		
Acenaphthene	<5.5	<5.5
Acenaphthylene	<5.5	<5.5
Anthracene	<2.2	<2.2
Benzo[a]anthracene	<2.2	<2.2
Benzo[a]pyrene	<2.2	<2.2
Benzo[b]fluoranthene	<2.2	<2.2
Benzo[g,h,i]perylene	<2.2	<2.2
Benzo[k]fluoranthene	<2.2	<2.2
bis(2-Chloroethoxy)methane	<5.5	<5.5
bis(2-Chloroethyl)ether	<2.2	<2.2
bis(2-Chloroisopropyl)ether	<2.2	<2.2
bis(2-Ethylhexyl)phthalate	<10.9	<11.0
4-Bromophenyl-phenylether	<5.5	<5.5
Butylbenzylphthalate	<2.2	<2.2
4-Chloro-3-methylphenol	<10.9	<11.0
2-Chloronaphthalene	<5.5	<5.5
2-Chlorophenol	<2.2	<2.2
4-Chlorophenyl-phenylether	<2.2	<2.2
Chrysene	<2.2	<2.2
Di-n-butylphthalate	<5.5	<5.5
Di-n-octylphthalate	<2.2	<2.2
Dibenz[a,h]anthracene	<2.2	<2.2
1,3-Dichlorobenzene	<2.2	<2.2
1,4-Dichlorobenzene	<2.2	<2.2
1,2-Dichlorobenzene	<2.2	<2.2
2,4-Dichlorophenol	<2.2	<2.2
Diethylphthalate	<5.5	<5.5
2,4-Dimethylphenol	<10.9	<11.0
Dimethylphthalate	<5.5	<5.5
4,6-Dinitro-2-methylphenol	<5.5	<5.5
2,4-Dinitrophenol	<21.9	<22.0
2,6-Dinitrotoluene	<2.2	<2.2
2,4-Dinitrotoluene	<2.2	<2.2
Fluoranthene	<2.2	<2.2
Fluorene	<2.2	<2.2
Hexachlorobenzene	<2.2	<2.2
Hexachlorobutadiene	<2.2	<2.2
Hexachlorocyclopentadiene	<2.2	<2.2
Hexachloroethane	<5.5	<5.5
Indeno[1,2,3-cd]pyrene	<2.2	<2.2
Isophorone	<2.2	<2.2
N-Nitroso-di-n-propylamine	<2.2	<2.2
N-Nitrosodiphenylamine	<5.5	<5.5
Naphthalene	<2.2	<2.2
Nitrobenzene	<2.2	<2.2

Appendix Table 5 continued.

<b>Stream</b>	<b>SALT CREEK</b>	<b>BUFFALO FORK</b>
River Mile	<b>5.6</b>	<b>2.13</b>
STORET Number	R16G23	R16G11
Date Sampled	6/10/2008	6/10/2008
Time Sampled	11:20 AM	11:00 AM
<b>Semivolatile Organic Compounds (ug/l)</b>		
2-Nitrophenol	<2.2	<2.2
4-Nitrophenol	<21.9	<22.0
Pentachlorophenol	<10.9	<11.0
Phenanthrene	<2.2	<2.2
Phenol	<2.2	<2.2
Pyrene	<2.2	<2.2
1,2,4-Trichlorobenzene	<2.2	<2.2
2,4,6-Trichlorophenol	<5.5	<5.5
<b>Pesticides (ug/l)</b>		
Aldrin	<0.0021	<0.0023
a-BHC	0.0094	0.0086
b-BHC	<0.0021	<0.0023
d-BHC	<0.0021	<0.0023
γ-BHC	<0.0021	<0.0023
4,4'-DDD	<0.0063	<0.0068
4,4'-DDE	<0.0021	<0.0023
4,4'-DDT	<0.0063	<0.0068
Dieldrin	<0.0021	0.0040
Endosulfan I	<0.0021	<0.0023
Endosulfan II	<0.0021	<0.0023
Endosulfan sulfate	<0.021	<0.023
Endrin	<0.0021	<0.0023
Endrin aldehyde	<0.0063	<0.0068
Heptachlor	<0.0021	<0.0023
Heptachlor epoxide	0.0037	0.0042
Methoxychlor	<0.010	<0.011
Mirex	<0.010	<0.011
Hexachlorobenzene	<0.0021	<0.0023
<b>Herbicides (ug/l)</b>		
Acetochlor	<0.22	<0.20 UJ
Alachlor	<0.22	<0.20 UJ
Atrazine	0.52	0.33 J
Benzo[a]pyrene	<0.54	<0.51 UJ
bis(2-Ethylhexyl)adipate	<0.54	<0.51 UJ
bis(2-Ethylhexyl)phthalate	1.15 B	1.25 B J
Butachlor	<0.22	<0.20 UJ
Metolachlor	0.32	0.29 J
Metribuzin	<0.22	<0.20 UJ
Pentachlorophenol	<5.38	<5.08 UJ
Propachlor	<0.22	<0.20 UJ
Simazine	<0.22	<0.20 UJ

< - Not detected at or above the method detection limit (MDL value reported with the less than symbol).

J - The analyte was positively identified, the associated value is estimated.

UJ - The analyte was not detected above the sample quantitation limit (QL). The reported QL is estimated.

B - Analyte result is estimated. Analyte was detected in the method blank as well as in the sample.

Appendix Table 6. Salt Creek -Cutler Lake chemical/physical water and sediment sampling results, 2008.

June 10, 2008 10:40AM Secchi Reading 0.76 M Location: Lat. 39.81712; Long. 81.85033						June 15, 2008 9:30AM Secchi Reading 1.0M Location Lat. 39.81714 Long. 81.8505				
Depth meter	Temp C.	umhos/cm	D.O. % Sat.	D.O. mg/L	pH	Temp C.	umhos/cm	D.O. % Sat.	D.O. mg/L	pH
0.5	26.11	286	93.0	7.4	7.9	22.30	378	85.8	7.4	7.8
1.0	25.85	287	89.3	7.3	7.3	21.90	378	67.4	5.9	7.6
1.5	21.46	247	28.3	2.7	7.2	21.20	379	58.1	5.1	7.5
2.0	17.02	260	4.0	0.4	7.0	20.00	381	26.7	2.4	7.3
2.5	15.54	315	1.1	0.1	7.0	19.80	386	4.3	0.4	7.2
3.0	13.10	367	0.8	0.1	7.0	15.90	383	1.8	0.2	7.1
3.5	12.15	384	0.7	0.1	7.0	13.30	397	1.6	0.2	7.1
4.0	11.36	396	0.6	0.1	7.0	11.40	417	1.5	0.2	7.1
4.5	10.60	410	0.6	0.1	7.0	---	---	---	---	---
June 18, 2008 9:40AM Secchi Reading 0.67M Location:						July 13, 2008 9:35M Secchi Reading 1.09M				
Depth meter	Temp C.	umhos/cm	D.O. % Sat.	D.O. mg/L	pH	Temp C.	umhos/cm	D.O. % Sat.	D.O. mg/L	pH
0.5	22.96	331	55.4	4.7	7.4	23.60	396	68.6	5.8	8.1
1.0	22.89	332	5.5	4.7	7.4	23.50	396	65.5	5.6	7.9
1.5	22.81	332	54.2	4.7	7.4	23.30	396	63.2	5.4	7.8
2.0	22.38	326	33.6	2.9	7.2	22.90	393	26.0	2.6	7.5
2.5	18.64	315	1.3	0.1	7.0	21.50	392	5.5	0.4	7.4
3.0	14.93	355	1.0	0.1	7.0	18.80	402	2.5	0.2	7.3
3.5	13.36	395	0.8	0.1	7.0	15.50	439	2.6	0.3	7.2
4.0	11.84	428	0.8	0.1	7.0	---	---	---	---	---
4.5	---	---	---	---	---	---	---	---	---	---
July 14, 2008 10:52AM Secchi Reading 0.98M Location: Lat.39.81742 Long. 81.85007						August 5, 2008 10:48AM Secchi Reading 1.12M Location: Lat. 39.81704 Long. 81.85013				
Depth meter	Temp C.	umhos/cm	D.O. % Sat.	D.O. mg/L	pH	Temp C.	umhos/cm	D.O. % Sat.	D.O. mg/L	pH
0.5	24.91	331	84.0	7.1	7.4	25.89	343	---	6.4	7.4
1.0	23.51	327	69.4	6.0	7.1	25.90	344	---	6.1	7.4
1.5	22.51	314	53.0	4.6	7.0	25.81	343	---	4.4	7.2
2.0	20.05	291	34.0	3.1	6.8	25.65	341	---	2.8	7.1
2.5	17.75	277	31.8	3.1	6.8	22.80	324	---	1.3	7.0
3.0	16.57	292	28.3	2.8	6.8	18.50	313	---	1.1	6.8
3.5	15.18	326	27.1	2.7	6.8	16.44	338	---	1.0	6.8
August 6, 2008 9:45AM Secchi Reading 1.38M Location: Lat. 39.81717 Long. 81.85041						August 27, 2008 10:35AM Secchi Reading 0.72M Location: Lat. 39.81713 Long. 81.85029				
Depth meter	Temp C.	umhos/cm	D.O. % Sat.	D.O. mg/L	pH	Temp C.	umhos/cm	D.O. % Sat.	D.O. mg/L	pH
0.5	22.90	435	53.5	4.6	7.5	24.03	347	---	5.7	7.5
1.0	22.90	435	48.8	4.2	7.4	24.08	348	---	5.5	7.5
1.5	22.90	435	48.8	4.2	7.4	24.07	349	---	4.8	7.1
2.0	22.90	435	48.2	4.1	7.4	24.00	348	---	4.6	7.4
2.5	22.70	436	45.3	3.9	7.4	23.51	352	---	1.0	7.1
3.0	20.80	464	9.0	0.8	7.0	21.62	352	---	0.1	6.9
3.5	18.50	49	10.2	0.9	6.9	18.80	355	---	0.1	6.8
4	15.80	539	9.4	0.9	6.8	---	---	---	---	---
September 1, 2008 10:00AM Secchi Reading 0.72M Location: Lat. 39.81716 Long. 81.85041										
Depth meter	Temp C.	umhos/cm	D.O. % Sat.	D.O. mg/L	pH					
0.5	21.80	428	46.1	4.0	7.5					
1.0	21.70	428	41.3	3.6	7.4					
1.5	21.70	427	48.6	4.3	7.3					
2.0	21.60	427	48.8	4.3	7.3					
2.5	21.60	427	49.1	4.3	7.3					
3.0	21.50	429	39.6	3.5	7.3					
3.5	19.70	495	22.9	2.1	6.8					
4	17.00	591	25.9	2.5	6.6					

Appendix Tabel 6 continued.

Cutler Lake		
Surface Sample June 10, 2008 10:15AM		
Location: Lat. 39.81712; Long. 81.85033		
Parameter	Unit	Result
Aluminum	ug/L	292
Ammonia	mg/L	<0.050
Arsenic	ug/L	<2.0
Barium	ug/L	53
Cadmium	ug/L	<0.20
Calcium	mg/L	47
Chromium	ug/L	<2.0
Conductivity	umhos/cm	320
Copper	ug/L	<2.0
Hardness, Total	mg/L	163
Iron	ug/L	463
Lead	ug/L	<2.0
Magnesium	mg/L	11
Manganese	ug/L	161
Nickel	ug/L	<2.0
Nitrate+nitrite	mg/L	<0.10
Nitrite	mg/L	<0.020
pH	s.u.	8.16
Potassium	mg/L	2
Selenium	ug/L	<2.0
Sodium	mg/L	5
Strontium	ug/L	195
Sulfate	mg/L	48.2
TKN	mg/L	<0.20
TOC	mg/L	6.5
Total Dissolved Solids	mg/L	220
Total Phosphorus	mg/L	0.019
Total Solids	mg/L	224
Total Suspended Solids	mg/L	8
Total Volatile Solids	mg/L	44
Zinc	ug/L	<10
Chlorophyll_a	ug/L	11.4
Pheophytin_a	ug/L	3.5

Appendix Tabel 6 continued.

Cutler Lake June 15, 2009		Surface Sample 9:30AM	Bottom Sample 9:40AM
Location	Lat.		
39.81714	Long. 81.8505		
Parameter	Unit	Result	Result
Aluminum	ug/L	<200	<200
Ammonia	mg/L	<0.050	<0.050
Arsenic	ug/L	<2.0	3.9
Barium	ug/L	62	74
Cadmium	ug/L	<0.20	<0.20
Calcium	mg/L	57	58
Chromium	ug/L	<2.0	<2.0
Conductivity	umhos/cm	413	422
Copper	ug/L	<2.0	<2.0
Hardness, Total	mg/L	200	202
Iron	ug/L	165	181
Lead	ug/L	<2.0	<2.0
Magnesium	mg/L	14	14
Manganese	ug/L	225	3830
Nickel	ug/L	<2.0	<2.0
Nitrate+nitrite	mg/L	0.1	<0.10
Nitrite	mg/L	<0.020	<0.020
pH	s.u.	8.03	7.95
Potassium	mg/L	2	2
Selenium	ug/L	<2.0	<2.0
Sodium	mg/L	7	7
Strontium	ug/L	252	260
Sulfate	mg/L	58.7	54.5
TKN	mg/L	0.36	0.48
TOC	mg/L	2.2	<2.0
Total Dissolved Solids	mg/L	252	254
Total Phosphorus	mg/L	0.011	0.012
Total Solids	mg/L	288	306
Total Suspended Solids	mg/L	6	8
Total Volatile Solids	mg/L	92	78
Zinc	ug/L	10	<10
<i>E.coli</i>	#/100ml	20JL	
Fecal Coliform	#/100ml	40JL	
Chlorophyll_a	ug/L	13.9	
Pheophytin_a	ug/L	3.2	

Appendix Tabel 6 continued.

Cutler Lake July 13, 2008			
Location: Lat.39.81711 Long. 81.85013		Surface Sample 9:49AM	Bottom Sample 10:00AM
Parameter	Unit	Result	Result
Aluminum	ug/L	<200	283
Ammonia	mg/L	<0.050	<0.050
Arsenic	ug/L	2.3	10.9
Barium	ug/L	64	100
Cadmium	ug/L	<0.20	<0.20
Calcium	mg/L	54	55
Chromium	ug/L	<2.0	<2.0
Conductivity	umhos/cm	389	422
Copper	ug/L	<2.0	<2.0
Hardness, Total	mg/L	188	191
Iron	ug/L	189	890
Lead	ug/L	<2.0	<2.0
Magnesium	mg/L	13	13
Manganese	ug/L	103	10100
Nickel	ug/L	<2.0	2.1
Nitrate+nitrite	mg/L	<0.10	<0.10
Nitrite	mg/L	<0.020	<0.020
pH	s.u.	7.71	7.31
Potassium	mg/L	2	2
Selenium	ug/L	<2.0	<2.0
Sodium	mg/L	7	7
Strontium	ug/L	247	250
Sulfate	mg/L	51.2	29.5
TKN	mg/L	0.86	1.27
TOC	mg/L	6.5	7.4
Total Dissolved Solids	mg/L	252	262
Total Phosphorus	mg/L	1.47	0.117
Total Solids	mg/L	244	280
Total Suspended Solids	mg/L	<5	15
Total Volatile Solids	mg/L	48	76
Zinc	ug/L	<10	<10
<i>E.coli</i>	#/100ml	<10	
Fecal Coliform	#/100ml	30JL	
Pheophytin_a	ug/L	3.8	
Chlorophyll_a	ug/L	14.5	



Appendix Tabel 6 continued.

Culter Lake July 14, 2008			
Location:		Surface	Bottom
Lat.39.81742	Long.	Sample	Sample
81.85007		11:11AM	11:20AM
Parameter	Units	Result	Result
Aluminum	ug/L	<200	793
Ammonia	mg/L	<0.050	<0.050
Arsenic	ug/L	<2.0	4.5
Barium	ug/L	53	74
Cadmium	ug/L	<0.20	<0.20
Calcium	mg/L	44	39
Chromium	ug/L	<2.0	<2.0
Conductivity	umhos/cm	324	287
Copper	ug/L	<2.0	2
Hardness, Total	mg/L	151	134
Iron	ug/L	264	1450
Lead	ug/L	<2.0	<2.0
Magnesium	mg/L	10	9
Manganese	ug/L	83	2790
Nickel	ug/L	<2.0	2.8
Nitrate+nitrite	mg/L	<0.10	<0.10
Nitrite	mg/L	<0.020	<0.020
pH	s.u.	7.85	7.37
Potassium	mg/L	2	2
Selenium	ug/L	<2.0	<2.0
Sodium	mg/L	5	<5
Strontium	ug/L	186	165
Sulfate	mg/L	39.8	25.6
TKN	mg/L	0.48	0.56
TOC	mg/L	6.8	8
Total Dissolved Solids	mg/L	202	184
Total Phosphorus	mg/L	0.028	0.032
Total Solids	mg/L	228	224
Total Suspended Solids	mg/L	6	17
Total Volatile Solids	mg/L	46	62
Zinc	ug/L	<10	<10
<i>E.coli</i>	#/100ml	10JL	
Fecal Coliform	#/100ml	30JL	
Chlorophyll_a	ug/L	6.5	
Pheophytin_a	ug/L	2.5	

Appendix Tabel 6 continued.

Culter Lake August 5, 2008			
Location: Lat. 39.81704 Long. 81.85013		Surface Sample 10:48AM	Bottom Sample 11:00AM
Parameter	Unit	Result	Result
Aluminum	ug/L	<200	302
Ammonia	mg/L	<0.050	<0.050
Arsenic	ug/L	2.1	9.7
Barium	ug/L	61	71
Cadmium	ug/L	<0.20	<0.20
Calcium	mg/L	49	46
Chromium	ug/L	<2.0	<2.0
Conductivity	umhos/cm	334	330
Copper	ug/L	<2.0	<2.0
Hardness, Total	mg/L	168	152
Iron	ug/L	113	1440
Lead	ug/L	<2.0	<2.0
Magnesium	mg/L	11	9
Manganese	ug/L	89	8910
Nickel	ug/L	<2.0	2.5
Nitrate+nitrite	mg/L	<0.10	0.66
Nitrite	mg/L	<0.020	<0.020
pH	s.u.	7.65	7.14
Potassium	mg/L	2	3
Selenium	ug/L	<2.0	<2.0
Sodium	mg/L	5	<5
Strontium	ug/L	201	182
Sulfate	mg/L	38.6	14.7
TKN	mg/L	0.52	0.51
TOC	mg/L	6.9	8.5
Total Dissolved Solids	mg/L	238	220
Total Phosphorus	mg/L	0.017	0.032
Total Solids	mg/L	224	228
Total Suspended Solids	mg/L	<5	18
Total Volatile Solids	mg/L	66	70
Zinc	ug/L	<10	<10
<i>E.coli</i>	#/100ml	30JL	
Fecal Coliform	#/100ml	70JL	
Chlorophyll_a	ug/L	13.2	
Pheophytin_a	ug/L	2.9	

Appendix Table 6 continued.

Sediment Sample 06/10/2008 10:20AM Location: Lat. 39.81712; Long. 81.85033			Sediment Sample 6/10/08 10:20AM Location: Lat. 39.81712; Long. 81.85033		
Parameter	Unit	Result	Parameter	Unit	Result
1,2,4,5-Tetrachlorobenzene	mg/kg	<1.12	Dibenzofuran	mg/kg	<1.12
1,2,4-Trichlorobenzene	mg/kg	<1.12	Diethylphthalate	mg/kg	<1.12
1,2-Dichlorobenzene	mg/kg	<1.12	Dimethylphthalate	mg/kg	<1.12
1,3-Dichlorobenzene	mg/kg	<1.12	Di-n-butylphthalate	mg/kg	<1.12
1,3-Dinitrobenzene	mg/kg	<1.12	Di-n-octylphthalate	mg/kg	<1.12
1,4-Dichlorobenzene	mg/kg	<1.12	Dinoseb	mg/kg	<1.12
1,4-Naphthoquinone	mg/kg	<1.12	Diphenylamine	mg/kg	<1.12
2,3,4,6-Tetrachlorophenol	mg/kg	<1.12	Ethyl methanesulfonate	mg/kg	<1.12
2,4,5-Trichlorophenol	mg/kg	<1.12	Fluoranthene	mg/kg	<1.12
2,4,6-Trichlorophenol	mg/kg	<1.12	Fluorene	mg/kg	<1.12
2,4-Dichlorophenol	mg/kg	<1.12	Hexachlorobenzene	mg/kg	<1.12
2,4-Dimethylphenol	mg/kg	<1.12	Hexachlorobutadiene	mg/kg	<1.12
2,4-Dinitrophenol	mg/kg	<5.6	Hexachlorocyclopentadiene	mg/kg	<1.12
2,4-Dinitrotoluene	mg/kg	<1.12	Hexachloroethane	mg/kg	<1.12
2,6-Dichlorophenol	mg/kg	<1.12	Hexachloropropene	mg/kg	<1.12
2,6-Dinitrotoluene	mg/kg	<1.12	Indeno[1,2,3-cd]pyrene	mg/kg	<1.12
2-Acetylaminofluorene	mg/kg	<1.12	Isophorone	mg/kg	<1.12
2-Chloronaphthalene	mg/kg	<1.12	Methyl methanesulfonate	mg/kg	<1.12
2-Chlorophenol	mg/kg	<1.12	Naphthalene	mg/kg	<1.12
2-Methylnaphthalene	mg/kg	<1.12	Nitrobenzene	mg/kg	<1.12
2-Methylphenol	mg/kg	<1.12	N-Nitroso-di-n-butylamine	mg/kg	<1.12
2-Nitroaniline	mg/kg	<1.12	N-Nitroso-di-n-propylamine	mg/kg	<1.12UJ
2-Nitrophenol	mg/kg	<1.12	N-Nitrosomorpholine	mg/kg	<1.12
2-Picoline	mg/kg	<1.12	N-Nitrosopiperidine	mg/kg	<1.12
3&4-Methylphenol	mg/kg	<1.12	N-Nitrosopyrrolidine	mg/kg	<1.12
3,3'-Dichlorobenzidine	mg/kg	<5.6	PCB-1016	ug/kg	<56.0
3-Methylcholanthrene	mg/kg	<1.12	PCB-1221	ug/kg	<56.0
4,6-Dinitro-2-methylphenol	mg/kg	<1.12	PCB-1232	ug/kg	<56.0
4-Bromophenyl-phenylether	mg/kg	<1.12	PCB-1242	ug/kg	<56.0
4-Chloro-3-methylphenol	mg/kg	<1.12	PCB-1248	ug/kg	<56.0
4-Chlorophenyl-phenylether	mg/kg	<1.12	PCB-1254	ug/kg	<56.0
4-Nitroaniline	mg/kg	<1.12	PCB-1260	ug/kg	<56.0
4-Nitrophenol	mg/kg	<5.6	p-Dimethylaminoazobenzene	mg/kg	<1.12
7,12-Dimethylbenz[a]anthracene	mg/kg	<5.6	Pentachlorobenzene	mg/kg	<1.12
Acenaphthene	mg/kg	<1.12	Pentachlorophenol	mg/kg	1.46
Acenaphthylene	mg/kg	<1.12	Phenacetin	mg/kg	<1.12
Acetophenone	mg/kg	<1.12	Phenanthrene	mg/kg	<1.12
Aniline	mg/kg	<5.6	Phenol	mg/kg	<1.12
Anthracene	mg/kg	<1.12	Pronamide	mg/kg	<1.12
Benz[a]anthracene	mg/kg	<1.12	Pyrene	mg/kg	<1.12
Benzo[a]pyrene	mg/kg	<1.12	Safrole	mg/kg	<1.12
Benzo[b]fluoranthene	mg/kg	<1.12	% Solids	%	33
Benzo[g,h,i]perylene	mg/kg	<1.12	Ammonia	mg/kg	200
Benzo[k]fluoranthene	mg/kg	<1.12	Chromium	mg/kg	26.6J
Benzyl alcohol	mg/kg	<1.12	Copper	mg/kg	25.8J
bis(2-Chloroethoxy)methane	mg/kg	<1.12	Lead	mg/kg	23.1
bis(2-Chloroethyl)ether	mg/kg	<1.12	Mercury	mg/kg	0.051
bis(2-Chloroisopropyl)ether	mg/kg	<1.12	TOC	%	2.1
bis(2-Ethylhexyl)phthalate	mg/kg	<1.12	Total Phosphorus	mg/kg	1050PT J
Butylbenzylphthalate	mg/kg	<1.12	Zinc	mg/kg	103
Chrysene	mg/kg	<1.12	% Solids	%	35.2
Dibenz[a,h]anthracene	mg/kg	<1.12			

Appendix Table 7. Concentrations of monitored chemicals in effluent discharged from four facilities within the Salt Creek study area. Results are reported for the time period 2003-2008. MDL = below lab method detection limit.

Discharger/ Parameter	50 <sup>th</sup> Percentile	95 <sup>th</sup> Percentile	Permit Limit -Monthly Avg.-	Permit Limit -Maximum-
Blue Rock State Park WWTP (0PP00088) – Manns Fork (2006-2008)				
Outfall 001 – RM 6.6				
Dissolved Oxygen (mg/l)	8.9	5.3 (5 <sup>th</sup> percentile)	Monitor	5.0 (min)
pH (S.U.)	6.5 (5 <sup>th</sup> percentile)	7.7	Monitor	6.5 (min)-9.0 (max)
Total Suspended Solids (mg/l)	5 – 75 (5 samples)		12	18
CBOD5 (mg/l)	1.2 – 7.14 (4 samples)		10	15
Ammonia-N (mg/l): winter	No data		4.5	6.8
Ammonia-N (mg/l): summer	0.083 – 4.09 (6 samples)		1.5	2.3
Chlorine, Total Residual (mg/l)	MDL		Monitor	0.019
Fecal Coliform (cfu/100ml): Summer	3 – 1200 (5 samples)		1000	2000
Flow Rate (MGD)	0.000477	0.00378	Monitor	Monitor
Outfall 002 – RM 6.77 (only four data points)				
pH (S.U.)	7.35 – 7.67		Monitor	6.5 (min)-9.0 (max)
Total Suspended Solids (mg/l)	MDL - 5		Monitor	Monitor
Flow Rate (MGD)	0.0064 – 0.010		Monitor	Monitor
Chlorine, Total Residual (mg/l)	0 – 0.07		Monitor	0.019
Muskingum County Water SE WTP (0IY00041) – Unnamed Trib. to Indian Run (RM 2.6, 0.3)				
pH (S.U.)	7.5 (5 <sup>th</sup> percentile)	8.5	Monitor	6.5 (min)-9.0 (max)
Total Suspended Solids (mg/l)	2	12	30	40
Flow Rate (MGD)	0.028	0.028	Monitor	Monitor
Chlorine, Total Residual (mg/l)	0.007	0.040	Monitor	0.019
Iron, Suspended (ug/l)	MDL	103	1000	2000
Manganese, Suspended (ug/l)	11	103	1000	2000
ODOT Rest Area 5-20 WWTP (0PP00052) – Frog Run (RM 0.9)				
Dissolved Oxygen (mg/l)	9.2	7.0 (5 <sup>th</sup> percentile)	Monitor	5.0 (min)
pH (S.U.)	6.7 (5 <sup>th</sup> percentile)	8.9	Monitor	6.5 (min)-9.0 (max)
Total Suspended Solids (mg/l)	<5	16.6	12	18
CBOD5 (mg/l)	2.1	10	10	15
Ammonia-N (mg/l): winter	0.09	13.8	Monitor	Monitor
Ammonia-N (mg/l): summer	0.05	13.3	2.3	3.0
Fecal Coliform (cfu/100ml): Summer	34	1825	1000	2000 (weekly)
Flow Rate (MGD)	0.0041	0.0086	Monitor	Monitor
Lumi-Lite Candle Co. (0IM00021) – Unnamed Trib. to Georges Run (RM 2.8, 1.0)				
pH (S.U.)	7.1 (5 <sup>th</sup> percentile)	7.8	Monitor	6.5 (min)-9.0 (max)
Total Suspended Solids (mg/l)	1	8.5	12	18 (weekly)
CBOD5 (mg/l)	3	13.2	10	15 (weekly)
Ammonia-N (mg/l): winter	0.1	0.93	4.5	6.8 (weekly)
Ammonia-N (mg/l): summer	0.15	0.52	1.5	2.3 (weekly)
Fecal Coliform (cfu/100ml): Summer	175	980	1000	2000 (weekly)
Flow Rate (MGD)	0.0011	0.0016	Monitor	Monitor
Chlorine, Total Residual (mg/l)	MDL	MDL	Monitor	0.019
Dissolved Oxygen (mg/l)	7.7	6.8 (5 <sup>th</sup> percentile)	Monitor	5.0 (min)



Appendix Table 9. Fish species and abundance for each sampling location in the Salt Creek study area (Muskingum River Basin), 2008-2009.

River Code: <b>17-940</b>	Stream: <b>Salt Creek</b>	Sample Date: <b>2009</b>
River Mile: <b>23.50</b>	Location: Knipe Rd.	Date Range: 08/20/2009
Time Fished: 3300 sec	Drainage: 14.0 sq mi	Thru: 09/17/2009
Dist Fished: 0.30 km	Basin: Muskingum River	No of Passes: 2
		Sampler Type: E

Species Name / ODNR status	IBI Grp	Feed Guild	Breed Guild Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Quillback	C	O	M	7	7.00	0.14	0.07	0.21	5.00
Northern Hog Sucker	R	I	S M	29	29.00	0.56	0.82	2.45	19.50
White Sucker	W	O	S T	474	474.00	9.15	6.65	19.93	7.39
Western Blacknose Dace	N	G	S T	47	47.00	0.91	0.18	0.55	2.00
Creek Chub	N	G	N T	345	345.00	6.66	6.68	20.02	11.02
Silver Shiner	N	I	S I	94	94.00	1.81	0.44	1.32	2.42
Redfin Shiner	N	I	N	2	2.00	0.04	0.01	0.03	2.50
Striped Shiner	N	I	S	43	43.00	0.83	0.40	1.20	5.26
Spotfin Shiner	N	I	M	26	26.00	0.50	0.12	0.36	2.50
Sand Shiner	N	I	M M	1,403	1,403.00	27.07	4.78	14.33	1.74
Silverjaw Minnow	N	I	M	628	628.00	12.12	2.63	7.89	2.10
Bluntnose Minnow	N	O	C T	1,659	1,659.00	32.01	8.86	26.56	2.73
Central Stoneroller	N	H	N	49	49.00	0.95	0.73	2.18	8.07
Trout-perch		I	M	94	94.00	1.81	0.66	1.98	3.67
Rock Bass	S	C	C	1	1.00	0.02			
Smallmouth Bass	F	C	C M	1	1.00	0.02	0.01	0.02	3.00
Blackside Darter	D	I	S	1	1.00	0.02	0.01	0.03	5.00
Logperch	D	I	S M	1	1.00	0.02	0.03	0.09	15.00
Johnny Darter	D	I	C	133	133.00	2.57	0.17	0.50	0.79
Greenside Darter	D	I	S M	35	35.00	0.68	0.04	0.12	1.67
Banded Darter	D	I	S I	13	13.00	0.25	0.03	0.08	1.71
Rainbow Darter	D	I	S M	9	9.00	0.17	0.01	0.04	2.00
Fantail Darter	D	I	C	89	89.00	1.72	0.04	0.13	0.63
<i>Mile Total</i>				5,183	5,183.00		33.37		
<i>Number of Species</i>				23					
<i>Number of Hybrids</i>				0					

## Species List

River Code: <b>17-940</b>	Stream: <b>Salt Creek</b>	Sample Date: <b>2009</b>
River Mile: <b>18.30</b>	Location: Norfield Rd.	Date Range: 08/20/2009
Time Fished: 3600 sec	Drainage: 23.5 sq mi	Thru: 09/16/2009
Dist Fished: 0.30 km	Basin: Muskingum River	No of Passes: 2
		Sampler Type: E

Species Name / ODNR status	IBI Grp	Feed Guild	Breed Guild Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Least Brook Lamprey		F	N	3	3.00	0.10	0.02	0.17	6.00
Silver Redhorse	R	I	S M	15	15.00	0.52	0.04	0.38	2.67
Golden Redhorse	R	I	S M	48	48.00	1.67	0.37	3.49	7.64
Northern Hog Sucker	R	I	S M	69	69.00	2.40	0.66	6.29	9.57
White Sucker	W	O	S T	481	481.00	16.74	2.35	22.35	4.88
Western Blacknose Dace	N	G	S T	42	42.00	1.46	0.04	0.42	1.06
Creek Chub	N	G	N T	455	455.00	15.84	2.67	25.40	5.86
South. Redbelly Dace	N	H	S	3	3.00	0.10	0.01	0.05	1.67
Silver Shiner	N	I	S I	38	38.00	1.32	0.13	1.22	3.37
Redfin Shiner	N	I	N	42	42.00	1.46	0.02	0.18	0.45
Striped Shiner	N	I	S	12	12.00	0.42	0.10	0.91	8.00
Spotfin Shiner	N	I	M	118	118.00	4.11	0.24	2.29	2.03
Sand Shiner	N	I	M M	200	200.00	6.96	0.40	3.81	2.00
Mimic Shiner	N	I	M I	10	10.00	0.35	0.02	0.19	2.00
Silverjaw Minnow	N	I	M	293	293.00	10.20	0.45	4.31	1.54
Bluntnose Minnow	N	O	C T	611	611.00	21.27	1.65	15.75	2.71
Central Stoneroller	N	H	N	59	59.00	2.05	0.55	5.19	9.24
Trout-perch		I	M	94	94.00	3.27	0.30	2.81	3.14
Rock Bass	S	C	C	9	9.00	0.31	0.17	1.64	19.11
Green Sunfish	S	I	C T	2	2.00	0.07	0.02	0.19	10.00
Blackside Darter	D	I	S	18	18.00	0.63	0.05	0.50	2.92
Logperch	D	I	S M	3	3.00	0.10	0.04	0.34	12.00
Johnny Darter	D	I	C	210	210.00	7.31	0.15	1.40	0.70
Greenside Darter	D	I	S M	9	9.00	0.31	0.02	0.20	2.33
Banded Darter	D	I	S I	9	9.00	0.31	0.02	0.20	2.36
Rainbow Darter	D	I	S M	1	1.00	0.03	0.00	0.02	2.00
Fantail Darter	D	I	C	19	19.00	0.66	0.03	0.28	1.55
<i>Mile Total</i>				2,873	2,873.00		10.49		
<i>Number of Species</i>				27					
<i>Number of Hybrids</i>				0					



## Species List

Page 39

River Code: <b>17-940</b>	Stream: <b>Salt Creek</b>	Sample Date: <b>2008</b>
River Mile: <b>12.80</b>	Location: dst. U.S. Rt. 40	Date Range: 08/04/2008
Time Fished: 4800 sec	Drainage: 43.0 sq mi	Thru: 09/16/2008
Dist Fished: 0.40 km	Basin: Muskingum River	No of Passes: 2
		Sampler Type: D

Species Name / ODNR status	IBI Grp	Feed Guild	Breed Guild Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Least Brook Lamprey		F	N	9	6.75	0.38	0.06	0.28	8.89
Gizzard Shad		O	M	33	24.75	1.39	1.79	8.25	72.42
Smallmouth Buffalo	C	I	M	2	1.50	0.08	0.29	1.31	190.00
Silver Redhorse	R	I	S M	8	6.00	0.34	0.08	0.37	13.33
Golden Redhorse	R	I	S M	91	68.25	3.85	3.96	18.23	58.02
Northern Hog Sucker	R	I	S M	142	106.50	6.00	2.36	10.88	22.18
White Sucker	W	O	S T	27	20.25	1.14	1.21	5.56	59.59
Common Carp	G	O	M T	1	0.75	0.04	1.73	7.94	2,300.00
Gravel Chub	N	I	S M	1	0.75	0.04	0.01	0.03	10.00
Western Blacknose Dace	N	G	S T	10	7.50	0.42	0.02	0.08	2.40
Creek Chub	N	G	N T	59	44.25	2.49	0.09	0.42	2.06
Emerald Shiner	N	I	M	207	155.25	8.75	0.21	0.97	1.35
Redfin Shiner	N	I	N	6	4.50	0.25	0.01	0.06	2.67
Striped Shiner	N	I	S	48	36.00	2.03	0.14	0.62	3.75
Spotfin Shiner	N	I	M	94	70.50	3.97	0.10	0.46	1.40
Sand Shiner	N	I	M M	130	97.50	5.49	0.13	0.62	1.38
Mimic Shiner	N	I	M I	166	124.50	7.02	0.17	0.78	1.36
Silverjaw Minnow	N	I	M	108	81.00	4.56	0.17	0.78	2.08
Bluntnose Minnow	N	O	C T	511	383.25	21.60	0.54	2.47	1.40
Central Stoneroller	N	H	N	300	225.00	12.68	0.87	4.01	3.87
Channel Catfish	F		C	5	3.75	0.21	1.13	5.21	302.00
Yellow Bullhead		I	C T	4	3.00	0.17	0.29	1.31	95.00
Trout-perch		I	M	1	0.75	0.04	0.00	0.01	4.00
Rock Bass	S	C	C	8	6.00	0.34	0.30	1.40	50.75
Smallmouth Bass	F	C	C M	16	12.00	0.68	2.56	11.79	213.47
Spotted Bass	F	C	C	31	23.25	1.31	1.81	8.33	77.81
Green Sunfish	S	I	C T	12	9.00	0.51	0.13	0.59	14.17
Bluegill Sunfish	S	I	C P	51	38.25	2.16	0.33	1.52	8.63
Longear Sunfish	S	I	C M	35	26.25	1.48	0.74	3.40	28.11
Pumpkinseed Sunfish	S	I	C P	1	0.75	0.04	0.01	0.03	8.00
Green Sf X Bluegill Sf				1	0.75	0.04	0.02	0.10	30.00
Blackside Darter	D	I	S	5	3.75	0.21	0.02	0.07	4.00
Logperch	D	I	S M	12	9.00	0.51	0.09	0.41	10.00
Johnny Darter	D	I	C	24	18.00	1.01	0.02	0.08	1.00
Greenside Darter	D	I	S M	52	39.00	2.20	0.08	0.38	2.12
Banded Darter	D	I	S I	63	47.25	2.66	0.05	0.23	1.06
Rainbow Darter	D	I	S M	23	17.25	0.97	0.03	0.12	1.52
Fantail Darter	D	I	C	68	51.00	2.87	0.05	0.21	0.88
Freshwater Drum			M P	1	0.75	0.04	0.15	0.69	200.00
<i>Mile Total</i>				2,366	1,774.50		21.72		
<i>Number of Species</i>				38					
<i>Number of Hybrids</i>				1					

River Code: <b>17-940</b>	Stream: <b>Salt Creek</b>	Sample Date: <b>2008</b>
River Mile: <b>5.60</b>	Location: dst. St. Rt. 146	Date Range: 08/05/2008
Time Fished: 4800 sec	Drainage: 75.7 sq mi	Thru: 09/16/2008
Dist Fished: 0.40 km	Basin: Muskingum River	No of Passes: 2
		Sampler Type: D

Species Name / ODNR status	IBI Grp	Feed Guild	Breed Guild Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Least Brook Lamprey		F	N	2	1.50	0.07	0.01	0.05	4.00
Gizzard Shad		O	M	20	15.00	0.71	0.14	1.11	9.30
Silver Redhorse	R	I	S M	10	7.50	0.35	0.32	2.51	42.00
Golden Redhorse	R	I	S M	171	128.25	6.07	1.32	10.50	10.29
Northern Hog Sucker	R	I	S M	215	161.25	7.63	2.87	22.83	17.79
White Sucker	W	O	S T	13	9.75	0.46	0.07	0.53	6.77
Smallmouth Redhorse	R	I	S M	1	0.75	0.04	0.03	0.24	40.00
Common Carp	G	O	M T	1	0.75	0.04	1.13	8.95	1,500.00
Western Blacknose Dace	N	G	S T	2	1.50	0.07	0.00	0.02	2.00
Creek Chub	N	G	N T	37	27.75	1.31	0.12	0.96	4.35
Suckermouth Minnow	N	I	S	6	4.50	0.21	0.05	0.38	10.50
South. Redbelly Dace	N	H	S	1	0.75	0.04	0.00	0.01	2.00
Emerald Shiner	N	I	M	261	195.75	9.27	0.27	2.12	1.36
Striped Shiner	N	I	S	49	36.75	1.74	0.12	0.99	3.39
Spotfin Shiner	N	I	M	209	156.75	7.42	0.23	1.79	1.44
Sand Shiner	N	I	M M	276	207.00	9.80	0.27	2.17	1.32
Mimic Shiner	N	I	M I	145	108.75	5.15	0.16	1.27	1.47
Silverjaw Minnow	N	I	M	86	64.50	3.05	0.12	0.93	1.80
Bluntnose Minnow	N	O	C T	721	540.75	25.59	0.92	7.34	1.71
Central Stoneroller	N	H	N	301	225.75	10.69	1.22	9.67	5.38
Channel Catfish	F		C	9	6.75	0.32	0.88	7.01	130.44
Rock Bass	S	C	C	3	2.25	0.11	0.15	1.19	66.00
Smallmouth Bass	F	C	C M	10	7.50	0.35	0.84	6.68	112.00
Spotted Bass	F	C	C	13	9.75	0.46	0.40	3.16	40.77
Bluegill Sunfish	S	I	C P	8	6.00	0.28	0.08	0.66	13.75
Longear Sunfish	S	I	C M	1	0.75	0.04	0.01	0.06	10.00
Blackside Darter	D	I	S	3	2.25	0.11	0.01	0.05	2.67
Logperch	D	I	S M	1	0.75	0.04	0.01	0.05	8.00
Eastern Sand Darter [S]	D	I	S R	30	22.50	1.06	0.03	0.24	1.33
Johnny Darter	D	I	C	17	12.75	0.60	0.02	0.17	1.65
Greenside Darter	D	I	S M	60	45.00	2.13	0.11	0.88	2.45
Banded Darter	D	I	S I	94	70.50	3.34	0.06	0.51	0.90
Rainbow Darter	D	I	S M	5	3.75	0.18	0.01	0.07	2.40
Fantail Darter	D	I	C	35	26.25	1.24	0.04	0.29	1.40
Freshwater Drum			M P	1	0.75	0.04	0.59	4.65	780.00
<i>Mile Total</i>				2,817	2,112.75		12.57		
<i>Number of Species</i>				35					
<i>Number of Hybrids</i>				0					

River Code: <b>17-940</b>	Stream: <b>Salt Creek</b>	Sample Date: <b>2008</b>
River Mile: <b>2.10</b>	Location: upst/dst. Manns Fork	Date Range: 08/05/2008
Time Fished: 4500 sec	Drainage: 144.0 sq mi	Thru: 09/16/2008
Dist Fished: 0.40 km	Basin: Muskingum River	No of Passes: 2
		Sampler Type: D

Species Name / ODNR status	IBI Grp	Feed Guild	Breed Guild Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Gizzard Shad		O	M	483	362.25	9.04	2.32	22.46	6.40
Golden Redhorse	R	I	S M	28	21.00	0.52	0.57	5.52	27.14
Northern Hog Sucker	R	I	S M	41	30.75	0.77	0.32	3.09	10.37
Smallmouth Redhorse	R	I	S M	1	0.75	0.02	0.02	0.18	25.00
Creek Chub	N	G	N T	9	6.75	0.17	0.02	0.17	2.56
Suckermouth Minnow	N	I	S	2	1.50	0.04	0.00	0.04	2.50
Emerald Shiner	N	I	M	1,985	1,488.75	37.17	2.29	22.17	1.54
Striped Shiner	N	I	S	5	3.75	0.09	0.01	0.10	2.60
Spotfin Shiner	N	I	M	197	147.75	3.69	0.28	2.67	1.86
Sand Shiner	N	I	M M	729	546.75	13.65	0.71	6.86	1.29
Mimic Shiner	N	I	M I	560	420.00	10.49	0.52	5.00	1.23
Ghost Shiner	N	I	M	8	6.00	0.15	0.01	0.07	1.25
Silverjaw Minnow	N	I	M	104	78.00	1.95	0.13	1.25	1.65
Fathead Minnow	N	O	C T	2	1.50	0.04	0.00	0.03	2.00
Bluntnose Minnow	N	O	C T	691	518.25	12.94	0.87	8.43	1.68
Central Stoneroller	N	H	N	143	107.25	2.68	0.58	5.58	5.37
Channel Catfish	F		C	16	12.00	0.30	0.31	2.98	25.63
Yellow Bullhead		I	C T	1	0.75	0.02	0.00	0.02	3.00
Flathead Catfish	F	P	C	2	1.50	0.04	0.08	0.74	51.00
Northern Madtom [E]		I	C R	1	0.75	0.02	0.00	0.02	3.00
Trout-perch		I	M	1	0.75	0.02	0.00	0.03	4.00
Rock Bass	S	C	C	2	1.50	0.04	0.03	0.25	17.00
Smallmouth Bass	F	C	C M	11	8.25	0.21	0.53	5.13	64.09
Spotted Bass	F	C	C	22	16.50	0.41	0.18	1.71	10.68
Largemouth Bass	F	C	C	3	2.25	0.06	0.14	1.31	60.00
Green Sunfish	S	I	C T	5	3.75	0.09	0.03	0.26	7.20
Bluegill Sunfish	S	I	C P	42	31.50	0.79	0.16	1.51	4.95
Pumpkinseed Sunfish	S	I	C P	1	0.75	0.02	0.01	0.11	15.00
Slenderhead Darter	D	I	S R	9	6.75	0.17	0.02	0.22	3.33
Logperch	D	I	S M	3	2.25	0.06	0.02	0.16	7.33
Eastern Sand Darter [S]	D	I	S R	54	40.50	1.01	0.07	0.65	1.67
Johnny Darter	D	I	C	29	21.75	0.54	0.02	0.22	1.03
Greenside Darter	D	I	S M	22	16.50	0.41	0.04	0.36	2.27
Banded Darter	D	I	S I	94	70.50	1.76	0.05	0.47	0.69
Rainbow Darter	D	I	S M	3	2.25	0.06	0.01	0.07	3.00
Fantail Darter	D	I	C	31	23.25	0.58	0.02	0.18	0.81
<i>Mile Total</i>				5,340	4,005.00		10.32		
<i>Number of Species</i>				36					
<i>Number of Hybrids</i>				0					

## Species List

River Code: <b>17-941</b>	Stream: <b>Manns Fork</b>	Sample Date: <b>2008</b>
River Mile: <b>4.30</b>	Location: adj. Cutler Lake Rd.	Date Range: 07/24/2008
Time Fished: 2400 sec	Drainage: 7.8 sq mi	
Dist Fished: 0.20 km	Basin: Muskingum River	No of Passes: 1
		Sampler Type: E

Species Name / ODNR status	IBI Grp	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Northern Hog Sucker	R	I	S	M	16	24.00	2.76			
White Sucker	W	O	S	T	10	15.00	1.72			
Western Blacknose Dace	N	G	S	T	3	4.50	0.52			
Creek Chub	N	G	N	T	83	124.50	14.31			
Striped Shiner	N	I	S		68	102.00	11.72			
Spotfin Shiner	N	I	M		9	13.50	1.55			
Silverjaw Minnow	N	I	M		3	4.50	0.52			
Bluntnose Minnow	N	O	C	T	82	123.00	14.14			
Central Stoneroller	N	H	N		177	265.50	30.52			
Yellow Bullhead		I	C	T	1	1.50	0.17			
Rock Bass	S	C	C		14	21.00	2.41			
Smallmouth Bass	F	C	C	M	3	4.50	0.52			
Spotted Bass	F	C	C		1	1.50	0.17			
Green Sunfish	S	I	C	T	7	10.50	1.21			
Bluegill Sunfish	S	I	C	P	3	4.50	0.52			
Johnny Darter	D	I	C		23	34.50	3.97			
Banded Darter	D	I	S	I	2	3.00	0.34			
Rainbow Darter	D	I	S	M	42	63.00	7.24			
Fantail Darter	D	I	C		33	49.50	5.69			
<i>Mile Total</i>					580	870.00				
<i>Number of Species</i>					19					
<i>Number of Hybrids</i>					0					

River Code: <b>17-941</b>	Stream: <b>Manns Fork</b>	Sample Date: <b>2008</b>
River Mile: <b>2.30</b>	Location: Mock Drive	Date Range: 07/30/2008
Time Fished: 4500 sec	Drainage: 18.6 sq mi	
Dist Fished: 0.20 km	Basin: Muskingum River	No of Passes: 1
		Sampler Type: E

Species Name / ODNR status	IBI Grp	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Golden Redhorse	R	I	S	M	5	7.50	0.30			
Northern Hog Sucker	R	I	S	M	40	60.00	2.40			
White Sucker	W	O	S	T	83	124.50	4.98			
Western Blacknose Dace	N	G	S	T	23	34.50	1.38			
Creek Chub	N	G	N	T	103	154.50	6.19			
South. Redbelly Dace	N	H	S		5	7.50	0.30			
Emerald Shiner	N	I	M		6	9.00	0.36			
Striped Shiner	N	I	S		204	306.00	12.25			
Spotfin Shiner	N	I	M		6	9.00	0.36			
Sand Shiner	N	I	M	M	55	82.50	3.30			
Silverjaw Minnow	N	I	M		52	78.00	3.12			
Bluntnose Minnow	N	O	C	T	351	526.50	21.08			
Central Stoneroller	N	H	N		522	783.00	31.35			
Yellow Bullhead		I	C	T	3	4.50	0.18			
Rock Bass	S	C	C		2	3.00	0.12			
Largemouth Bass	F	C	C		1	1.50	0.06			
Green Sunfish	S	I	C	T	2	3.00	0.12			
Bluegill Sunfish	S	I	C	P	3	4.50	0.18			
Johnny Darter	D	I	C		60	90.00	3.60			
Greenside Darter	D	I	S	M	4	6.00	0.24			
Rainbow Darter	D	I	S	M	89	133.50	5.35			
Fantail Darter	D	I	C		46	69.00	2.76			
<i>Mile Total</i>					1,665	2,497.50				
<i>Number of Species</i>					22					
<i>Number of Hybrids</i>					0					

# Species List

River Code: <b>17-942</b>	Stream: <b>Kent Run</b>	Sample Date: <b>2008</b>
River Mile: <b>1.20</b>	Location: upst. Browning Rd.	Date Range: 07/10/2008
Time Fished: 2400 sec	Drainage: 7.5 sq mi	
Dist Fished: 0.15 km	Basin: Muskingum River	No of Passes: 1
		Sampler Type: E

Species Name / ODNR status	IBI Grp	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Northern Hog Sucker	R	I	S	M	1	2.00	0.13			
White Sucker	W	O	S	T	45	90.00	5.99			
Western Blacknose Dace	N	G	S	T	36	72.00	4.79			
Creek Chub	N	G	N	T	117	234.00	15.58			
South. Redbelly Dace	N	H	S		110	220.00	14.65			
Redside Dace	N	I	S	I	38	76.00	5.06			
Striped Shiner	N	I	S		80	160.00	10.65			
Silverjaw Minnow	N	I	M		12	24.00	1.60			
Bluntnose Minnow	N	O	C	T	56	112.00	7.46			
Central Stoneroller	N	H	N		164	328.00	21.84			
Rock Bass	S	C	C		5	10.00	0.67			
Green Sunfish	S	I	C	T	4	8.00	0.53			
Bluegill Sunfish	S	I	C	P	3	6.00	0.40			
Johnny Darter	D	I	C		12	24.00	1.60			
Rainbow Darter	D	I	S	M	28	56.00	3.73			
Fantail Darter	D	I	C		40	80.00	5.33			
<i>Mile Total</i>					751	1,502.00				
<i>Number of Species</i>					16					
<i>Number of Hybrids</i>					0					

# Species List

River Code: <b>17-943</b>	Stream: <b>Boggs Creek</b>	Sample Date: <b>2008</b>
River Mile: <b>4.10</b>	Location: upst. St. Rt. 146	Date Range: 09/03/2008
Time Fished: 1800 sec	Drainage: 10.4 sq mi	
Dist Fished: 0.12 km	Basin: Muskingum River	No of Passes: 1
		Sampler Type: E

Species Name / ODNR status	IBI Grp	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Golden Redhorse	R	I	S	M	15	37.50	1.35			
Northern Hog Sucker	R	I	S	M	31	77.50	2.80			
White Sucker	W	O	S	T	42	105.00	3.79			
Western Blacknose Dace	N	G	S	T	2	5.00	0.18			
Creek Chub	N	G	N	T	151	377.50	13.63			
Emerald Shiner	N	I	M		68	170.00	6.14			
Striped Shiner	N	I	S		125	312.50	11.28			
Spotfin Shiner	N	I	M		68	170.00	6.14			
Sand Shiner	N	I	M	M	12	30.00	1.08			
Silverjaw Minnow	N	I	M		162	405.00	14.62			
Bluntnose Minnow	N	O	C	T	204	510.00	18.41			
Central Stoneroller	N	H	N		55	137.50	4.96			
Yellow Bullhead		I	C	T	5	12.50	0.45			
Rock Bass	S	C	C		1	2.50	0.09			
Largemouth Bass	F	C	C		2	5.00	0.18			
Green Sunfish	S	I	C	T	10	25.00	0.90			
Bluegill Sunfish	S	I	C	P	2	5.00	0.18			
Green Sf X Bluegill Sf					1	2.50	0.09			
Johnny Darter	D	I	C		63	157.50	5.69			
Greenside Darter	D	I	S	M	2	5.00	0.18			
Rainbow Darter	D	I	S	M	17	42.50	1.53			
Fantail Darter	D	I	C		70	175.00	6.32			
<i>Mile Total</i>					1,108	2,770.00				
<i>Number of Species</i>					21					
<i>Number of Hybrids</i>					1					

## Species List

River Code: <b>17-943</b>	Stream: <b>Boggs Creek</b>	Sample Date: <b>2008</b>
River Mile: <b>0.90</b>	Location: Salt Creek Drive	Date Range: 09/02/2008
Time Fished: 1800 sec	Drainage: 17.8 sq mi	
Dist Fished: 0.15 km	Basin: Muskingum River	No of Passes: 1
		Sampler Type: E

Species Name / ODNR status	IBI Grp	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Silver Redhorse	R	I	S	M	4	8.00	0.16			
Golden Redhorse	R	I	S	M	25	50.00	0.99			
Northern Hog Sucker	R	I	S	M	44	88.00	1.74			
White Sucker	W	O	S	T	24	48.00	0.95			
Smallmouth Redhorse	R	I	S	M	4	8.00	0.16			
Creek Chub	N	G	N	T	73	146.00	2.89			
Suckermouth Minnow	N	I	S		5	10.00	0.20			
Emerald Shiner	N	I	M		321	642.00	12.70			
Striped Shiner	N	I	S		16	32.00	0.63			
Spotfin Shiner	N	I	M		394	788.00	15.59			
Sand Shiner	N	I	M	M	233	466.00	9.22			
Mimic Shiner	N	I	M	I	169	338.00	6.69			
Silverjaw Minnow	N	I	M		93	186.00	3.68			
Bluntnose Minnow	N	O	C	T	600	1,200.00	23.73			
Central Stoneroller	N	H	N		274	548.00	10.84			
Channel Catfish	F		C		1	2.00	0.04			
Yellow Bullhead		I	C	T	2	4.00	0.08			
Stonecat Madtom		I	C	I	1	2.00	0.04			
Smallmouth Bass	F	C	C	M	4	8.00	0.16			
Largemouth Bass	F	C	C		6	12.00	0.24			
Warmouth Sunfish	S	C	C		1	2.00	0.04			
Green Sunfish	S	I	C	T	6	12.00	0.24			
Bluegill Sunfish	S	I	C	P	41	82.00	1.62			
Orangespotted Sunfish	S	I	C		5	10.00	0.20			
Green Sf X Bluegill Sf					1	2.00	0.04			
Logperch	D	I	S	M	7	14.00	0.28			
Johnny Darter	D	I	C		31	62.00	1.23			
Greenside Darter	D	I	S	M	22	44.00	0.87			
Banded Darter	D	I	S	I	2	4.00	0.08			
Rainbow Darter	D	I	S	M	2	4.00	0.08			
Fantail Darter	D	I	C		117	234.00	4.63			
<i>Mile Total</i>					2,528	5,056.00				
<i>Number of Species</i>					30					
<i>Number of Hybrids</i>					1					



River Code: <b>17-944</b>	Stream: <b>Indian Run</b>	Sample Date: <b>2008</b>
River Mile: <b>0.10</b>	Location: at mouth	Date Range: 09/19/2008
Time Fished: 2473 sec	Drainage: 4.2 sq mi	
Dist Fished: 0.15 km	Basin: Muskingum River	No of Passes: 1
		Sampler Type: E

Species Name / ODNR status	IBI Grp	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Golden Redhorse	R	I	S	M	1	2.00	0.04	0.06	0.31	29.00
Northern Hog Sucker	R	I	S	M	2	4.00	0.08	0.37	1.99	92.00
White Sucker	W	O	S	T	109	218.00	4.54	2.90	15.65	13.30
Western Blacknose Dace	N	G	S	T	27	54.00	1.12	0.15	0.79	2.70
Creek Chub	N	G	N	T	224	448.00	9.33	4.12	22.24	9.20
South. Redbelly Dace	N	H	S		2	4.00	0.08	0.02	0.11	5.00
Emerald Shiner	N	I	M		19	38.00	0.79	0.09	0.48	2.35
Striped Shiner	N	I	S		76	152.00	3.17	0.24	1.28	1.57
Spotfin Shiner	N	I	M		264	528.00	11.00	0.81	4.39	1.54
Silverjaw Minnow	N	I	M		68	136.00	2.83	0.30	1.63	2.22
Bluntnose Minnow	N	O	C	T	1,214	2,428.00	50.56	5.67	30.57	2.33
Central Stoneroller	N	H	N		130	260.00	5.41	1.64	8.84	6.30
Yellow Bullhead		I	C	T	19	38.00	0.79	0.61	3.30	16.12
Western Mosquitofish	E	I	N		1	2.00	0.04	0.01	0.04	4.00
Largemouth Bass	F	C	C		17	34.00	0.71	0.47	2.56	13.94
Green Sunfish	S	I	C	T	12	24.00	0.50	0.34	1.84	14.22
Bluegill Sunfish	S	I	C	P	12	24.00	0.50	0.22	1.19	9.20
Green Sf X Bluegill Sf					1	2.00	0.04	0.01	0.06	6.00
Johnny Darter	D	I	C		117	234.00	4.87	0.31	1.68	1.33
Greenside Darter	D	I	S	M	2	4.00	0.08	0.02	0.11	5.00
Rainbow Darter	D	I	S	M	2	4.00	0.08	0.00	0.01	0.50
Fantail Darter	D	I	C		82	164.00	3.42	0.17	0.90	1.02
<i>Mile Total</i>					2,401	4,802.00		18.53		
<i>Number of Species</i>					21					
<i>Number of Hybrids</i>					1					

## Species List

Page 48

River Code: <b>17-945</b>	Stream: <b>Buffalo Fork</b>	Sample Date: <b>2008</b>
River Mile: <b>6.50</b>	Location: Leedom Rd.	Date Range: 07/23/2008
Time Fished: 4200 sec	Drainage: 9.9 sq mi	
Dist Fished: 0.20 km	Basin: Muskingum River	No of Passes: 1
		Sampler Type: E

Species Name / ODNR status	IBI Grp	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Northern Hog Sucker	R	I	S	M	24	36.00	4.72			
White Sucker	W	O	S	T	2	3.00	0.39			
Creek Chub	N	G	N	T	23	34.50	4.53			
Striped Shiner	N	I	S		46	69.00	9.06			
Sand Shiner	N	I	M	M	7	10.50	1.38			
Silverjaw Minnow	N	I	M		12	18.00	2.36			
Bluntnose Minnow	N	O	C	T	55	82.50	10.83			
Central Stoneroller	N	H	N		261	391.50	51.38			
Brown Bullhead		I	C	T	3	4.50	0.59			
Rock Bass	S	C	C		6	9.00	1.18			
Smallmouth Bass	F	C	C	M	4	6.00	0.79			
Green Sunfish	S	I	C	T	13	19.50	2.56			
Bluegill Sunfish	S	I	C	P	4	6.00	0.79			
Green Sf X Bluegill Sf					1	1.50	0.20			
Johnny Darter	D	I	C		3	4.50	0.59			
Greenside Darter	D	I	S	M	1	1.50	0.20			
Banded Darter	D	I	S	I	2	3.00	0.39			
Rainbow Darter	D	I	S	M	35	52.50	6.89			
Fantail Darter	D	I	C		6	9.00	1.18			
<i>Mile Total</i>					508	762.00				
<i>Number of Species</i>					18					
<i>Number of Hybrids</i>					1					

River Code: <b>17-945</b>	Stream: <b>Buffalo Fork</b>	Sample Date: <b>2008</b>
River Mile: <b>2.10</b>	Location: Okey Rd.	Date Range: 07/23/2008
Time Fished: 3000 sec	Drainage: 25.9 sq mi	
Dist Fished: 0.20 km	Basin: Muskingum River	No of Passes: 1
		Sampler Type: E

Species Name / ODNR status	IBI Grp	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Golden Redhorse	R	I	S	M	7	10.50	1.46	0.75	16.63	71.43
Northern Hog Sucker	R	I	S	M	15	22.50	3.13	0.56	12.48	25.00
White Sucker	W	O	S	T	2	3.00	0.42	0.02	0.53	8.00
Western Blacknose Dace	N	G	S	T	1	1.50	0.21	0.00	0.07	2.00
Creek Chub	N	G	N	T	3	4.50	0.63	0.01	0.20	2.00
Silver Shiner	N	I	S	I	3	4.50	0.63	0.01	0.20	2.00
Rosyface Shiner	N	I	S	I	1	1.50	0.21	0.00	0.07	2.00
Striped Shiner	N	I	S		19	28.50	3.96	0.14	3.17	5.00
Spotfin Shiner	N	I	M		6	9.00	1.25	0.01	0.20	1.00
Sand Shiner	N	I	M	M	46	69.00	9.58	0.14	3.06	2.00
Silverjaw Minnow	N	I	M		6	9.00	1.25	0.02	0.40	2.00
Bluntnose Minnow	N	O	C	T	78	117.00	16.25	0.23	5.19	2.00
Central Stoneroller	N	H	N		118	177.00	24.58	0.53	11.64	2.97
Channel Catfish	F		C		1	1.50	0.21	0.15	3.33	100.00
Yellow Bullhead		I	C	T	1	1.50	0.21	0.11	2.33	70.00
Rock Bass	S	C	C		2	3.00	0.42	0.15	3.33	50.00
Smallmouth Bass	F	C	C	M	7	10.50	1.46	0.74	16.29	70.00
Largemouth Bass	F	C	C		2	3.00	0.42	0.03	0.67	10.00
Green Sunfish	S	I	C	T	18	27.00	3.75	0.41	8.98	15.00
Bluegill Sunfish	S	I	C	P	5	7.50	1.04	0.06	1.33	8.00
Logperch	D	I	S	M	9	13.50	1.88	0.14	2.99	10.00
Johnny Darter	D	I	C		5	7.50	1.04	0.01	0.18	1.00
Greenside Darter	D	I	S	M	48	72.00	10.00	0.08	1.66	1.04
Banded Darter	D	I	S	I	3	4.50	0.63	0.01	0.20	2.00
Rainbow Darter	D	I	S	M	43	64.50	8.96	0.13	2.86	2.00
Fantail Darter	D	I	C		31	46.50	6.46	0.09	2.06	2.00
<i>Mile Total</i>					480	720.00		4.51		
<i>Number of Species</i>					26					
<i>Number of Hybrids</i>					0					

River Code: <b>17-945</b>	Stream: <b>Buffalo Fork</b>	Sample Date: <b>2008</b>
River Mile: <b>1.50</b>	Location: 0.6 miles dst. Okey Rd.	Date Range: 09/03/2008
Time Fished: 1800 sec	Drainage: 26.4 sq mi	
Dist Fished: 0.15 km	Basin: Muskingum River	No of Passes: 1
		Sampler Type: E

Species Name / ODNR status	IBI Grp	Feed Guild	Breed Guild Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Gizzard Shad		O	M	3	6.00	0.35	0.03	0.28	5.00
Golden Redhorse	R	I	S M	12	24.00	1.41	1.80	16.60	75.00
Northern Hog Sucker	R	I	S M	35	70.00	4.11	1.70	15.65	24.24
White Sucker	W	O	S T	5	10.00	0.59	0.08	0.74	8.00
Western Blacknose Dace	N	G	S T	1	2.00	0.12	0.00	0.04	2.00
Creek Chub	N	G	N T	11	22.00	1.29	0.04	0.34	1.67
Emerald Shiner	N	I	M	22	44.00	2.58	0.03	0.28	0.68
Striped Shiner	N	I	S	41	82.00	4.81	0.40	3.69	4.88
Spotfin Shiner	N	I	M	13	26.00	1.53	0.02	0.18	0.77
Sand Shiner	N	I	M M	155	310.00	18.19	0.34	3.10	1.08
Mimic Shiner	N	I	M I	12	24.00	1.41	0.03	0.24	1.08
Silverjaw Minnow	N	I	M	54	108.00	6.34	0.18	1.66	1.67
Bluntnose Minnow	N	O	C T	138	276.00	16.20	0.44	4.06	1.59
Central Stoneroller	N	H	N	169	338.00	19.84	1.09	10.08	3.23
Yellow Bullhead		I	C T	6	12.00	0.70	0.80	7.38	66.67
Rock Bass	S	C	C	7	14.00	0.82	0.68	6.27	48.57
Smallmouth Bass	F	C	C M	14	28.00	1.64	2.00	18.44	71.43
Largemouth Bass	F	C	C	1	2.00	0.12	0.04	0.37	20.00
Green Sunfish	S	I	C T	13	26.00	1.53	0.42	3.87	16.15
Bluegill Sunfish	S	I	C P	13	26.00	1.53	0.20	1.84	7.69
Green Sf X Bluegill Sf				4	8.00	0.47	0.19	1.75	23.75
Logperch	D	I	S M	2	4.00	0.23	0.04	0.37	10.00
Johnny Darter	D	I	C	23	46.00	2.70	0.04	0.37	0.87
Greenside Darter	D	I	S M	30	60.00	3.52	0.13	1.20	2.17
Banded Darter	D	I	S I	3	6.00	0.35	0.01	0.11	2.00
Rainbow Darter	D	I	S M	27	54.00	3.17	0.06	0.55	1.11
Fantail Darter	D	I	C	38	76.00	4.46	0.06	0.55	0.79
<i>Mile Total</i>				852	1,704.00		10.85		
<i>Number of Species</i>				26					
<i>Number of Hybrids</i>				1					

## Species List

River Code: <b>17-946</b>	Stream: <b>Williams Fork</b>	Sample Date: <b>2008</b>
River Mile: <b>0.20</b>	Location: adj. Pine Lake Rd.	Date Range: 07/14/2008
Time Fished: 1800 sec	Drainage: 6.7 sq mi	
Dist Fished: 0.15 km	Basin: Muskingum River	No of Passes: 1
		Sampler Type: E

Species Name / ODNR status	IBI Grp	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Northern Hog Sucker	R	I	S	M	5	10.00	0.22			
White Sucker	W	O	S	T	42	84.00	1.86			
Western Blacknose Dace	N	G	S	T	86	172.00	3.82			
Creek Chub	N	G	N	T	170	340.00	7.55			
South. Redbelly Dace	N	H	S		54	108.00	2.40			
Striped Shiner	N	I	S		26	52.00	1.15			
Silverjaw Minnow	N	I	M		59	118.00	2.62			
Bluntnose Minnow	N	O	C	T	682	1,364.00	30.27			
Central Stoneroller	N	H	N		671	1,342.00	29.78			
Largemouth Bass	F	C	C		7	14.00	0.31			
Bluegill Sunfish	S	I	C	P	1	2.00	0.04			
Johnny Darter	D	I	C		196	392.00	8.70			
Greenside Darter	D	I	S	M	58	116.00	2.57			
Rainbow Darter	D	I	S	M	29	58.00	1.29			
Fantail Darter	D	I	C		167	334.00	7.41			
<i>Mile Total</i>					2,253	4,506.00				
<i>Number of Species</i>					15					
<i>Number of Hybrids</i>					0					

# Species List

River Code: <b>17-948</b>	Stream: <b>White Eyes Creek</b>	Sample Date: <b>2008</b>
River Mile: <b>1.70</b>	Location: Okey Rd.	Date Range: 07/14/2008
Time Fished: 2700 sec	Drainage: 8.1 sq mi	
Dist Fished: 0.20 km	Basin: Muskingum River	No of Passes: 1
		Sampler Type: E

Species Name / ODNR status	IBI Grp	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Northern Hog Sucker	R	I	S	M	18	27.00	1.93			
White Sucker	W	O	S	T	61	91.50	6.55			
Western Blacknose Dace	N	G	S	T	10	15.00	1.07			
Creek Chub	N	G	N	T	93	139.50	9.98			
Emerald Shiner	N	I	M		1	1.50	0.11			
Striped Shiner	N	I	S		66	99.00	7.08			
Spotfin Shiner	N	I	M		7	10.50	0.75			
Sand Shiner	N	I	M	M	22	33.00	2.36			
Silverjaw Minnow	N	I	M		38	57.00	4.08			
Bluntnose Minnow	N	O	C	T	233	349.50	25.00			
Central Stoneroller	N	H	N		238	357.00	25.54			
Rock Bass	S	C	C		14	21.00	1.50			
Smallmouth Bass	F	C	C	M	7	10.50	0.75			
Bluegill Sunfish	S	I	C	P	8	12.00	0.86			
Johnny Darter	D	I	C		40	60.00	4.29			
Greenside Darter	D	I	S	M	24	36.00	2.58			
Rainbow Darter	D	I	S	M	19	28.50	2.04			
Fantail Darter	D	I	C		33	49.50	3.54			
<i>Mile Total</i>					932	1,398.00				
<i>Number of Species</i>					18					
<i>Number of Hybrids</i>					0					

River Code: <b>17-949</b>	Stream: <b>Pleasant Run</b>	Sample Date: <b>2008</b>
River Mile: <b>0.10</b>	Location: Clay Pike	Date Range: 07/30/2008
Time Fished: 5483 sec	Drainage: 2.3 sq mi	Thru: 08/21/2008
Dist Fished: 0.30 km	Basin: Muskingum River	No of Passes: 2
		Sampler Type: E

Species Name / ODNR status	IBI Grp	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Least Brook Lamprey		F	N		2	2.00	0.10			
Northern Hog Sucker	R	I	S	M	15	15.00	0.78			
White Sucker	W	O	S	T	202	202.00	10.52			
Western Blacknose Dace	N	G	S	T	77	77.00	4.01			
Creek Chub	N	G	N	T	605	605.00	31.49			
South. Redbelly Dace	N	H	S		52	52.00	2.71			
Striped Shiner	N	I	S		72	72.00	3.75			
Common Shiner	N	I	S		73	73.00	3.80			
Spotfin Shiner	N	I	M		27	27.00	1.41			
Silverjaw Minnow	N	I	M		33	33.00	1.72			
Bullhead Minnow	N	O	C		3	3.00	0.16			
Bluntnose Minnow	N	O	C	T	282	282.00	14.68			
Central Stoneroller	N	H	N		335	335.00	17.44			
Rock Bass	S	C	C		2	2.00	0.10			
Largemouth Bass	F	C	C		5	5.00	0.26			
Green Sunfish	S	I	C	T	5	5.00	0.26			
Bluegill Sunfish	S	I	C	P	25	25.00	1.30			
Johnny Darter	D	I	C		36	36.00	1.87			
Rainbow Darter	D	I	S	M	13	13.00	0.68			
Fantail Darter	D	I	C		57	57.00	2.97			
<i>Mile Total</i>					1,921	1,921.00				
<i>Number of Species</i>					20					
<i>Number of Hybrids</i>					0					

# Species List

River Code: <b>17-950</b>	Stream: <b>Little Salt Creek</b>	Sample Date: <b>2009</b>
River Mile: <b>5.60</b>	Location: upst. Sanora Rd.	Date Range: 09/01/2009
Time Fished: 3041 sec	Drainage: 7.5 sq mi	
Dist Fished: 0.20 km	Basin: Muskingum River	No of Passes: 1
		Sampler Type: E

Species Name / ODNR status	IBI Grp	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Northern Hog Sucker	R	I	S	M	10	15.00	1.09			
White Sucker	W	O	S	T	44	66.00	4.80			
Western Blacknose Dace	N	G	S	T	70	105.00	7.64			
Creek Chub	N	G	N	T	21	31.50	2.29			
Striped Shiner	N	I	S		60	90.00	6.55			
Silverjaw Minnow	N	I	M		96	144.00	10.48			
Bluntnose Minnow	N	O	C	T	238	357.00	25.98			
Central Stoneroller	N	H	N		124	186.00	13.54			
Largemouth Bass	F	C	C		14	21.00	1.53			
Green Sunfish	S	I	C	T	10	15.00	1.09			
Bluegill Sunfish	S	I	C	P	18	27.00	1.97			
Johnny Darter	D	I	C		72	108.00	7.86			
Greenside Darter	D	I	S	M	37	55.50	4.04			
Fantail Darter	D	I	C		102	153.00	11.14			
<i>Mile Total</i>					916	1,374.00				
<i>Number of Species</i>					14					
<i>Number of Hybrids</i>					0					



# Species List

River Code: <b>17-950</b> River Mile: <b>5.10</b> Time Fished: 2063 sec Dist Fished: 0.15 km	Stream: <b>Little Salt Creek</b> Location: Sanora Rd. Drainage: 8.0 sq mi Basin: Muskingum River	Sample Date: <b>2008</b> Date Range: 08/21/2008  No of Passes: 1 Sampler Type: E
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Species Name / ODNR status	IBI Grp	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Northern Hog Sucker	R	I	S	M	16	32.00	0.89			
White Sucker	W	O	S	T	75	150.00	4.19			
Western Blacknose Dace	N	G	S	T	11	22.00	0.61			
Creek Chub	N	G	N	T	274	548.00	15.30			
Striped Shiner	N	I	S		28	56.00	1.56			
Silverjaw Minnow	N	I	M		107	214.00	5.97			
Bluntnose Minnow	N	O	C	T	633	1,266.00	35.34			
Central Stoneroller	N	H	N		407	814.00	22.72			
Rock Bass	S	C	C		2	4.00	0.11			
Largemouth Bass	F	C	C		3	6.00	0.17			
Green Sunfish	S	I	C	T	18	36.00	1.01			
Bluegill Sunfish	S	I	C	P	15	30.00	0.84			
Johnny Darter	D	I	C		84	168.00	4.69			
Greenside Darter	D	I	S	M	44	88.00	2.46			
Fantail Darter	D	I	C		74	148.00	4.13			
<i>Mile Total</i>					1,791	3,582.00				
<i>Number of Species</i>					15					
<i>Number of Hybrids</i>					0					

# Species List

River Code: <b>17-950</b>	Stream: <b>Little Salt Creek</b>	Sample Date: <b>2008</b>
River Mile: <b>0.10</b>	Location: Clay Pike	Date Range: 09/02/2008
Time Fished: 1800 sec	Drainage: 14.7 sq mi	
Dist Fished: 0.14 km	Basin: Muskingum River	No of Passes: 1
		Sampler Type: E

Species Name / ODNR status	IBI Grp	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Gizzard Shad		O	M		22	47.14	1.38			
Golden Redhorse	R	I	S	M	8	17.14	0.50			
Northern Hog Sucker	R	I	S	M	55	117.86	3.46			
White Sucker	W	O	S	T	24	51.43	1.51			
Western Blacknose Dace	N	G	S	T	26	55.71	1.64			
Creek Chub	N	G	N	T	439	940.71	27.61			
Suckermouth Minnow	N	I	S		9	19.29	0.57			
South. Redbelly Dace	N	H	S		1	2.14	0.06			
Emerald Shiner	N	I	M		28	60.00	1.76			
Striped Shiner	N	I	S		31	66.43	1.95			
Spotfin Shiner	N	I	M		100	214.29	6.29			
Sand Shiner	N	I	M	M	143	306.43	8.99			
Mimic Shiner	N	I	M	I	5	10.71	0.31			
Silverjaw Minnow	N	I	M		66	141.43	4.15			
Bluntnose Minnow	N	O	C	T	227	486.43	14.28			
Central Stoneroller	N	H	N		250	535.71	15.72			
Largemouth Bass	F	C	C		1	2.14	0.06			
Green Sunfish	S	I	C	T	2	4.29	0.13			
Bluegill Sunfish	S	I	C	P	1	2.14	0.06			
Johnny Darter	D	I	C		34	72.86	2.14			
Greenside Darter	D	I	S	M	24	51.43	1.51			
Banded Darter	D	I	S	I	33	70.71	2.08			
Rainbow Darter	D	I	S	M	12	25.71	0.75			
Fantail Darter	D	I	C		49	105.00	3.08			
<i>Mile Total</i>					1,590	3,407.14				
<i>Number of Species</i>					24					
<i>Number of Hybrids</i>					0					

River Code: <b>17-951</b>	Stream: <b>Frog Run</b>	Sample Date: <b>2008</b>
River Mile: <b>0.10</b>	Location: near mouth	Date Range: 08/21/2008
Time Fished: 2344 sec	Drainage: 6.2 sq mi	
Dist Fished: 0.15 km	Basin: Muskingum River	No of Passes: 1
		Sampler Type: E

Species Name / ODNR status	IBI Grp	Feed Guild	Breed Guild Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Least Brook Lamprey		F	N	8	16.00	0.33			
Northern Hog Sucker	R	I	S M	30	60.00	1.22			
White Sucker	W	O	S T	79	158.00	3.22			
Western Blacknose Dace	N	G	S T	51	102.00	2.08			
Creek Chub	N	G	N T	92	184.00	3.75			
South. Redbelly Dace	N	H	S	6	12.00	0.24			
Striped Shiner	N	I	S	141	282.00	5.74			
Spotfin Shiner	N	I	M	67	134.00	2.73			
Silverjaw Minnow	N	I	M	28	56.00	1.14			
Fathead Minnow	N	O	C T	6	12.00	0.24			
Bluntnose Minnow	N	O	C T	1,204	2,408.00	49.02			
Central Stoneroller	N	H	N	492	984.00	20.03			
Trout-perch		I	M	1	2.00	0.04			
Smallmouth Bass	F	C	C M	2	4.00	0.08			
Green Sunfish	S	I	C T	2	4.00	0.08			
Bluegill Sunfish	S	I	C P	6	12.00	0.24			
Blackside Darter	D	I	S	1	2.00	0.04			
Johnny Darter	D	I	C	66	132.00	2.69			
Greenside Darter	D	I	S M	45	90.00	1.83			
Banded Darter	D	I	S I	2	4.00	0.08			
Rainbow Darter	D	I	S M	31	62.00	1.26			
Fantail Darter	D	I	C	96	192.00	3.91			
<i>Mile Total</i>				2,456	4,912.00				
<i>Number of Species</i>				22					
<i>Number of Hybrids</i>				0					

## Species List

River Code: <b>17-952</b>	Stream: <b>Georges Run</b>	Sample Date: <b>2008</b>
River Mile: <b>1.80</b>	Location: dst. U.S. Rt.22/U.S. Rt. 40	Date Range: 08/27/2008
Time Fished: 2400 sec	Drainage: 5.5 sq mi	
Dist Fished: 0.15 km	Basin: Muskingum River	No of Passes: 1
		Sampler Type: E

Species Name / ODNR status	IBI Grp	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Golden Redhorse	R	I	S	M	4	8.00	0.11			
Northern Hog Sucker	R	I	S	M	24	48.00	0.65			
White Sucker	W	O	S	T	130	260.00	3.52			
Western Blacknose Dace	N	G	S	T	136	272.00	3.68			
Creek Chub	N	G	N	T	396	792.00	10.72			
South. Redbelly Dace	N	H	S		26	52.00	0.70			
Striped Shiner	N	I	S		267	534.00	7.23			
Spotfin Shiner	N	I	M		177	354.00	4.79			
Silverjaw Minnow	N	I	M		121	242.00	3.28			
Fathead Minnow	N	O	C	T	1	2.00	0.03			
Bluntnose Minnow	N	O	C	T	774	1,548.00	20.95			
Central Stoneroller	N	H	N		1,416	2,832.00	38.33			
Yellow Bullhead		I	C	T	2	4.00	0.05			
Largemouth Bass	F	C	C		10	20.00	0.27			
Green Sunfish	S	I	C	T	5	10.00	0.14			
Bluegill Sunfish	S	I	C	P	30	60.00	0.81			
Green Sf X Bluegill Sf					1	2.00	0.03			
Johnny Darter	D	I	C		29	58.00	0.79			
Greenside Darter	D	I	S	M	8	16.00	0.22			
Rainbow Darter	D	I	S	M	23	46.00	0.62			
Fantail Darter	D	I	C		114	228.00	3.09			
<i>Mile Total</i>					3,694	7,388.00				
<i>Number of Species</i>					20					
<i>Number of Hybrids</i>					1					

Appendix Table 10. Fish Index Biotic Integrity (IBI) scores and metrics for sites in the Salt Creek (Muskingum River) study area, 2008-2009.

River Mile	Type	Date	Drainage area (sq mi)	Number of						Percent of Individuals					Rel.No. minus tolerants /(0.3km)	IBI	
				Total species	Minnow species	Headwater species	Sensitive species	Darter & Sculpin species	Simple Lithophils	Tolerant fishes	Omni- vores	Pioneering fishes	Insect- ivores	DELT anomalies			
<b>Salt Creek - (17-940)</b>																	
Year: 2009																	
23.50	E	09/17/2009	14.0	22(5)	10(5)	2(3)	8(5)	7(5)	10(5)	49(3)	42(1)	54(3)	50(5)	0.0(5)	4974(5)	50	
<b>Manns Fork - (17-941)</b>																	
Year: 2008																	
4.30	E	07/24/2008	7.8	19(5)	7(5)	2(3)	4(3)	4(5)	6(5)	32(5)	16(3)	34(3)	36(3)	0.0(5)	591(3)	48	
2.30	E	07/30/2008	18.6	22(5)	10(5)	3(3)	5(3)	4(3)	8(5)	34(3)	26(3)	34(3)	35(3)	0.0(5)	1650(5)	46	
<b>Kent Run - (17-942)</b>																	
Year: 2008																	
1.20	E	07/10/2008	7.5	16(5)	8(5)	4(5)	3(3)	3(3)	7(5)	34(3)	14(5)	27(5)	29(3)	0.0(5)	986(5)	52	
<b>Boggs Creek - (17-943)</b>																	
Year: 2008																	
4.10	E	09/03/2008	10.4	21(5)	9(5)	2(3)	5(3)	4(5)	7(5)	37(3)	22(3)	53(3)	59(5)	0.0(5)	1735(5)	50	
0.90	E	09/02/2008	17.8	30(5)	10(5)	1(1)	* (5)	6(5)	11(5)	28(5)	25(3)	32(3)	61(5)	0.0(5)	3646(5)	52	
<b>Indian Run - (17-944)</b>																	
Year: 2008																	
0.10	E	09/19/2008	4.2	20(5)	9(5)	3(3)	4(5)	4(5)	8(5)	67(1)	55(1)	68(1)	28(3)	0.0(5)	1592(5)	44	
<b>Buffalo Fork - (17-945)</b>																	
Year: 2008																	
6.50	E	07/23/2008	9.9	18(5)	6(3)	1(1)	6(5)	5(5)	6(5)	19(5)	11(5)	21(5)	31(3)	0.0(5)	618(3)	50	
<b>Williams Creek - (17-946)</b>																	
Year: 2008																	
0.20	E	07/14/2008	6.7	15(5)	7(5)	3(3)	3(3)	4(5)	7(5)	44(3)	32(1)	49(3)	24(3)	0.0(5)	2546(5)	46	
<b>White Eyes Creek - (17-948)</b>																	
Year: 2008																	
1.70	E	07/14/2008	8.1	18(5)	9(5)	2(3)	5(5)	4(5)	6(5)	43(3)	32(1)	43(3)	30(3)	0.0(5)	803(5)	48	
<b>Pleasant Run - (17-949)</b>																	
Year: 2008																	
0.10	E	08/21/2008	2.3	17(5)	8(5)	3(3)	2(3)	3(5)	6(5)	58(1)	23(1)	48(3)	19(3)	0.0(5)	850(5)	44	

♦ - IBI is low end adjusted.

\* - &lt; 200 Total individuals in sample

\*\* - &lt; 50 Total individuals in sample

● - One or more species excluded from IBI calculation.

Appendix Table 10. Fish Index Biotic Integrity (IBI) scores and metrics for sites in the Salt Creek (Muskingum River) study area, 2008-2009.

River Mile	Type	Date	Drainage area (sq mi)	Number of						Percent of Individuals					Rel.No. minus tolerants /(0.3km)	IBI
				Total species	Minnow species	Headwater species	Sensitive species	Darter & Sculpin species	Simple Lithophils	Tolerant fishes	Omni-vores	Pioneering fishes	Insect-ivores	DELT anomalies		
0.10	E	07/30/2008	2.3	18(5)	9(5)	4(5)	2(3)	3(5)	6(5)	64(1)	28(1)	52(3)	18(3)	0.1(5)	650(5)	46
<i>Little Salt Creek - (17-950)</i>																
Year: 2009																
5.60	E	09/01/2009	7.5	14(5)	6(5)	2(3)	2(1)	3(3)	5(3)	42(3)	31(1)	48(3)	44(5)	0.0(5)	800(5)	42
Year: 2008																
5.10	E	08/21/2008	8.0	15(5)	6(5)	2(3)	2(1)	3(3)	5(3)	56(3)	40(1)	62(1)	22(3)	0.0(5)	1560(5)	38
0.10	E	09/02/2008	14.7	24(5)	12(5)	3(3)	7(5)	5(5)	10(5)	45(3)	17(5)	48(3)	38(3)	0.0(5)	1869(5)	52
<i>Frog Run - (17-951)</i>																
Year: 2008																
0.10	E	08/21/2008	6.2	22(5)	9(5)	4(5)	5(5)	6(5)	9(5)	58(1)	53(1)	57(1)	21(3)	0.0(5)	2044(5)	46
<i>Georges Run - (17-952)</i>																
Year: 2008																
1.80	E	08/27/2008	5.5	20(5)	9(5)	3(3)	4(3)	4(5)	8(5)	39(3)	25(3)	36(3)	22(3)	0.0(5)	4500(5)	48

◆ - IBI is low end adjusted.

\* - < 200 Total individuals in sample

\*\* - < 50 Total individuals in sample

● - One or more species excluded from IBI calculation.

Appendix Table 10. Fish Index Biotic Integrity (IBI) scores and metrics for sites in the Salt Creek (Muskingum River) study area, 2008-2009.

River Mile	Type	Date	Drainage area (sq mi)	Number of					Percent of Individuals					Rel.No. minus tolerants /(0.3km)	IBI	Modified Iwb	
				Total species	Sunfish species	Sucker species	Intolerant species	Darter species	Simple Lithophils	Tolerant fishes	Omni-vores	Top carnivores	Insect-ivores				DELT anomalies
Salt Creek - (17940)																	
Year: 2009																	
18.30	E	09/16/2009	23	26(5)	2(3)	4(5)	3(3)	6(5)	25(3)	55(1)	38(1)	0.1(1)	42(3)	0.0(5)	2342(5)	40	9.4
Year: 2008																	
12.80	D	08/04/2008	43	33(5)	4(5)	3(3)	2(1)	7(5)	26(3)	34(3)	32(3)	2.7(3)	58(5)	0.0(5)	671(3)	44	9.8
12.80	D	09/16/2008	43	33(5)	5(5)	5(5)	2(1)	7(5)	18(3)	23(5)	21(3)	2.2(3)	57(5)	0.0(5)	1943(5)	50	10.7
5.60	D	08/05/2008	75	29(5)	2(3)	4(5)	3(3)	7(5)	23(3)	26(3)	25(3)	0.9(1)	61(5)	0.0(5)	1422(5)	46	9.8
5.60	D	09/16/2008	75	30(5)	3(3)	4(5)	3(3)	8(5)	23(3)	28(3)	29(3)	1.0(1)	58(5)	0.0(5)	1643(5)	46	9.9
2.10	D	08/05/2008	144	33(5)	4(5)	3(3)	5(3)	7(5)	7(1)	19(5)	19(3)	1.0(3)	72(5)	0.0(5)	1661(5)	48	9.5
2.10	D	09/16/2008	144	26(5)	3(3)	2(1)	3(3)	6(5)	4(1)	11(5)	23(3)	0.7(1)	75(5)	0.0(5)	5288(5)	42	9.6
Buffalo Fork - (17945)																	
Year: 2008																	
2.10	E	07/23/2008	25	26(5)	3(3)	3(5)	3(3)	6(5)	31(3)	21(5)	17(5)	2.3(3)	55(5)	0.0(5)	566(3)	50	8.9
1.50	E	09/03/2008	26	26(5)	3(3)	3(5)	2(3)	6(5)	18(3)	20(5)	17(5)	2.6(3)	59(5)	0.0(5)	1356(5)	52	9.6

na - Qualitative data, Modified Iwb not applicable.

◆ - IBI is low end adjusted.

\* - < 200 Total individuals in sample

\*\* - < 50 Total individuals in sample

● - One or more species excluded from IBI calculation.

Appendix Table 11. Macroinvertebrate species and results for each sampling location in the Salt Creek (Muskingum River) study area, 2008-2009.



Ohio EPA/DSW Ecological Assessment Section  
 Macroinvertebrate Collection

Site: Salt Creek  
 Bethel Rd.

Collection Date: 07/29/2008 River Code: 17-940 RM: 25.70

Taxa Code	Taxa	Quant/Qual	Taxa Code	Taxa	Quant/Qual
03301	<i>Plumatellidae</i>	+	84440	<i>Polypedilum (Uresipedilum) aviceps</i>	+
03600	<i>Oligochaeta</i>	+	84450	<i>Polypedilum (Uresipedilum) flavum</i>	+
07820	<i>Cambarus (Cambarus) sp A</i>	+	84460	<i>Polypedilum (P.) fallax group</i>	+
08260	<i>Orconectes (Crockerinus) sanbornii sanbornii</i>	+	84470	<i>Polypedilum (P.) illinoense</i>	+
11120	<i>Baetis flavistriga</i>	+	84750	<i>Stictochironomus sp</i>	+
11150	<i>Pseudocloeon propinquum</i>	+	85500	<i>Paratanytarsus sp</i>	+
11250	<i>Centroptilum sp (w/o hindwing pads)</i>	+	85625	<i>Rheotanytarsus sp</i>	+
11430	<i>Dipheter hageni</i>	+	85800	<i>Tanytarsus sp</i>	+
13400	<i>Stenacron sp</i>	+	96900	<i>Ferrissia sp</i>	+
13521	<i>Stenonema femoratum</i>	+	98600	<i>Sphaerium sp</i>	+
13590	<i>Maccaffertium vicarium</i>	+			
14950	<i>Leptophlebia sp or Paraleptophlebia sp</i>	+	No. Quantitative Taxa: 0		Total Taxa: 54
17200	<i>Caenis sp</i>	+	No. Qualitative Taxa: 54		ICI:
18600	<i>Ephemera sp</i>	+	Number of Organisms: 0		Qual EPT: 14
21001	<i>Calopterygidae</i>	+			
22001	<i>Coenagrionidae</i>	+			
23909	<i>Boyeria vinosa</i>	+			
45400	<i>Trichocorixa sp</i>	+			
47600	<i>Sialis sp</i>	+			
51400	<i>Nyctiophylax sp</i>	+			
52200	<i>Cheumatopsyche sp</i>	+			
52530	<i>Hydropsyche depravata group</i>	+			
57900	<i>Pycnopsyche sp</i>	+			
66200	<i>Cymbiodyta sp</i>	+			
68130	<i>Helichus sp</i>	+			
69275	<i>Optioservus trivittatus</i>	+			
69400	<i>Stenelmis sp</i>	+			
71100	<i>Hexatoma sp</i>	+			
72340	<i>Dixella sp</i>	+			
72700	<i>Anopheles sp</i>	+			
77500	<i>Conchapelopia sp</i>	+			
77800	<i>Helopelopia sp</i>	+			
78140	<i>Labrundinia pilosella</i>	+			
78500	<i>Paramerina fragilis</i>	+			
79400	<i>Zavrelimyia sp</i>	+			
80370	<i>Corynoneura lobata</i>	+			
80646	<i>Epoicocladus sp 3 (sensu Jacobsen, 1992)</i>	+			
81650	<i>Parametriocnemus sp</i>	+			
81690	<i>Paratrichocladus sp</i>	+			
81825	<i>Rheocricotopus (Psilocricotopus) robacki</i>	+			
82730	<i>Chironomus (C.) decorus group</i>	+			
83820	<i>Microtendipes "caelum" (sensu Simpson &amp; Bode, 1980)</i>	+			
84210	<i>Paratendipes albimanus or P. duplicatus</i>	+			
84300	<i>Phaenopsectra obediens group</i>	+			

Ohio EPA/DSW Ecological Assessment Section  
Macroinvertebrate Collection

Site: Salt Creek  
Leachman Rd.

Collection Date: 07/29/2008 River Code: 17-940 RM: 25.00

Taxa Code	Taxa	Quant/Qual	Taxa Code	Taxa	Quant/Qual
03360	<i>Plumatella sp</i>	+	84210	<i>Paratendipes albimanus or P. duplicatus</i>	+
03600	<i>Oligochaeta</i>	+	84300	<i>Phaenopsectra obediens group</i>	+
07820	<i>Cambarus (Cambarus) sp A</i>	+	84440	<i>Polypedilum (Uresipedilum) aviceps</i>	+
08260	<i>Orconectes (Crockerinus) sanbornii sanbornii</i>	+	84450	<i>Polypedilum (Uresipedilum) flavum</i>	+
11018	<i>Acerpenna macdunnoughi</i>	+	84470	<i>Polypedilum (P.) illinoense</i>	+
11120	<i>Baetis flavistriga</i>	+	84540	<i>Polypedilum (Tripodura) scalaenum group</i>	+
11130	<i>Baetis intercalaris</i>	+	85500	<i>Paratanytarsus sp</i>	+
11150	<i>Pseudocloeon propinquum</i>	+	85625	<i>Rheotanytarsus sp</i>	+
11430	<i>Dipheter hageni</i>	+	87540	<i>Hemerodromia sp</i>	+
12200	<i>Isonychia sp</i>	+	95100	<i>Physella sp</i>	+
13400	<i>Stenacron sp</i>	+	98200	<i>Pisidium sp</i>	+
13590	<i>Maccaffertium vicarium</i>	+	98600	<i>Sphaerium sp</i>	+
17200	<i>Caenis sp</i>	+			
23600	<i>Aeshna sp</i>	+	No. Quantitative Taxa: 0		Total Taxa: 56
23909	<i>Boyeria vinosa</i>	+	No. Qualitative Taxa: 56		ICI:
45300	<i>Sigara sp</i>	+	Number of Organisms: 0		Qual EPT: 12
47600	<i>Sialis sp</i>	+			
52200	<i>Cheumatopsyche sp</i>	+			
52430	<i>Ceratopsyche morosa group</i>	+			
52530	<i>Hydropsyche depravata group</i>	+			
60900	<i>Peltodytes sp</i>	+			
64800	<i>Uvarus sp</i>	+			
66500	<i>Enochrus sp</i>	+			
67100	<i>Hydrobius sp</i>	+			
67500	<i>Laccobius sp</i>	+			
67700	<i>Paracymus sp</i>	+			
67800	<i>Tropisternus sp</i>	+			
68130	<i>Helichus sp</i>	+			
68700	<i>Dubiraphia sp</i>	+			
69400	<i>Stenelmis sp</i>	+			
74100	<i>Simulium sp</i>	+			
77500	<i>Conchapelopia sp</i>	+			
77800	<i>Helopelopia sp</i>	+			
78350	<i>Meropelopia sp</i>	+			
78655	<i>Procladius (Holotanypus) sp</i>	+			
80420	<i>Cricotopus (C.) bicinctus</i>	+			
80430	<i>Cricotopus (C.) tremulus group</i>	+			
81231	<i>Nanocladius (N.) crassicornus or N. (N.) "rectinervis"</i>	+			
81240	<i>Nanocladius (N.) distinctus</i>	+			
81650	<i>Parametriocnemus sp</i>	+			
81825	<i>Rheocricotopus (Psilocricotopus) robacki</i>	+			
83040	<i>Dicrotendipes neomodestus</i>	+			
83840	<i>Microtendipes pedellus group</i>	+			
84155	<i>Paralauterborniella nigrohalteralis</i>	+			

**Ohio EPA/DSW Ecological Assessment Section  
Macroinvertebrate Collection**

Site: Salt Creek  
Knipe Rd.

Collection Date: 07/22/2008 River Code: 17-940 RM: 23.50

Taxa Code	Taxa	Quant/Qual	Taxa Code	Taxa	Quant/Qual
00653	<i>Eunapius fragilis</i>	+			
03301	<i>Plumatellidae</i>	+			
06201	<i>Hyalella azteca</i>	+			
07860	<i>Cambarus (Puncticambarus) robustus</i>	+			
08260	<i>Orconectes (Crockerinus) sanbornii sanbornii</i>	+			
11150	<i>Pseudocloeon propinquum</i>	+			
12200	<i>Isonychia sp</i>	+			
13000	<i>Leucrocuta sp</i>	+			
13400	<i>Stenacron sp</i>	+			
13590	<i>Maccaffertium vicarium</i>	+			
15000	<i>Paraleptophlebia sp</i>	+			
17200	<i>Caenis sp</i>	+			
21001	<i>Calopterygidae</i>	+			
23909	<i>Boyeria vinosa</i>	+			
34130	<i>Acroneuria frisoni</i>	+			
47600	<i>Sialis sp</i>	+			
49101	<i>Sisyridae</i>	+			
51600	<i>Polycentropus sp</i>	+			
52200	<i>Cheumatopsyche sp</i>	+			
52430	<i>Ceratopsyche morosa group</i>	+			
57900	<i>Pycnopsyche sp</i>	+			
59500	<i>Oecetis sp</i>	+			
60300	<i>Dineutus sp</i>	+			
68130	<i>Helichus sp</i>	+			
68708	<i>Dubiraphia vittata group</i>	+			
68901	<i>Macronychus glabratus</i>	+			
69400	<i>Stenelmis sp</i>	+			
71700	<i>Pilaria sp</i>	+			
72700	<i>Anopheles sp</i>	+			
77800	<i>Helopelopia sp</i>	+			
80420	<i>Cricotopus (C.) bicinctus</i>	+			
81270	<i>Nanocladius (N.) spinipennis</i>	+			
81650	<i>Parametriocnemus sp</i>	+			
82101	<i>Thienemanniella taurocapita</i>	+			
83840	<i>Microtendipes pedellus group</i>	+			
84440	<i>Polypedilum (Uresipedilum) aviceps</i>	+			
84450	<i>Polypedilum (Uresipedilum) flavum</i>	+			
84750	<i>Stictochironomus sp</i>	+			
85625	<i>Rheotanytarsus sp</i>	+			
95100	<i>Physella sp</i>	+			

No. Quantitative Taxa: 0                      Total Taxa: 40  
 No. Qualitative Taxa: 40                      ICI:  
 Number of Organisms: 0                      Qual EPT: 13

Ohio EPA/DSW Ecological Assessment Section  
 Macroinvertebrate Collection

Site: Salt Creek  
 Norfield Rd.

Collection Date: 08/05/2008 River Code: 17-940 RM: 18.30

Taxa Code	Taxa	Quant/Qual	Taxa Code	Taxa	Quant/Qual
03600	<i>Oligochaeta</i>	+	84300	<i>Phaenopsectra obediens group</i>	+
06201	<i>Hyalella azteca</i>	+	84450	<i>Polypedilum (Uresipedilum) flavum</i>	+
08260	<i>Orconectes (Crockerinus) sanbornii sanbornii</i>	+	84460	<i>Polypedilum (P.) fallax group</i>	+
11130	<i>Baetis intercalaris</i>	+	84470	<i>Polypedilum (P.) illinoense</i>	+
11150	<i>Pseudocloeon propinquum</i>	+	84540	<i>Polypedilum (Tripodura) scalaenum group</i>	+
11200	<i>Callibaetis sp</i>	+	84612	<i>Saetheria tylus</i>	+
11650	<i>Procloeon sp (w/ hindwing pads)</i>	+	84750	<i>Stictochironomus sp</i>	+
11670	<i>Procloeon viridoculare</i>	+	85261	<i>Cladotanytarsus vanderwulpi group Type 1</i>	+
12200	<i>Isonychia sp</i>	+	85500	<i>Paratanytarsus sp</i>	+
13550	<i>Maccaffertium mexicanum integrum</i>	+	85625	<i>Rheotanytarsus sp</i>	+
13590	<i>Maccaffertium vicarium</i>	+	85800	<i>Tanytarsus sp</i>	+
14950	<i>Leptophlebia sp or Paraleptophlebia sp</i>	+	85840	<i>Tanytarsus sepp</i>	+
17200	<i>Caenis sp</i>	+	95100	<i>Physella sp</i>	+
18750	<i>Hexagenia limbata</i>	+	96900	<i>Ferrissia sp</i>	+
21200	<i>Calopteryx sp</i>	+			
23909	<i>Boyeria vinosa</i>	+	No. Quantitative Taxa: 0		Total Taxa: 58
24900	<i>Gomphus sp</i>	+	No. Qualitative Taxa: 58		ICI:
25605	<i>Stylurus laurae</i>	+	Number of Organisms: 0		Qual EPT: 16
45100	<i>Palmacorixa sp</i>	+			
45900	<i>Notonecta sp</i>	+			
47600	<i>Sialis sp</i>	+			
51600	<i>Polycentropus sp</i>	+			
52200	<i>Cheumatopsyche sp</i>	+			
52430	<i>Ceratopsyche morosa group</i>	+			
52530	<i>Hydropsyche depravata group</i>	+			
59700	<i>Triaenodes sp</i>	+			
60300	<i>Dineutus sp</i>	+			
66500	<i>Enochrus sp</i>	+			
67700	<i>Paracymus sp</i>	+			
68130	<i>Helichus sp</i>	+			
68601	<i>Ancyronyx variegata</i>	+			
68708	<i>Dubiraphia vittata group</i>	+			
68901	<i>Macronychus glabratus</i>	+			
69400	<i>Stenelmis sp</i>	+			
71100	<i>Hexatoma sp</i>	+			
74100	<i>Simulium sp</i>	+			
77120	<i>Ablabesmyia mallochi</i>	+			
78140	<i>Labrundinia pilosella</i>	+			
78350	<i>Meropelopia sp</i>	+			
80204	<i>Brillia flavifrons group</i>	+			
80420	<i>Cricotopus (C.) bicinctus</i>	+			
81650	<i>Parametrioctenemus sp</i>	+			
81825	<i>Rheocricotopus (Psilocricotopus) robacki</i>	+			
83820	<i>Microtendipes "caelum" (sensu Simpson &amp; Bode, 1980)</i>	+			

**Ohio EPA/DSW Ecological Assessment Section  
Macroinvertebrate Collection**

Site: Salt Creek

Collection Date: 08/14/2008 River Code: 17-940 RM: 12.70

dst. U.S. Rt. 40

Taxa Code	Taxa	Quant/Qual	Taxa Code	Taxa	Quant/Qual
00401	<i>Spongillidae</i>	+	68130	<i>Helichus sp</i>	2 +
01801	<i>Turbellaria</i>	27 +	68601	<i>Ancyronyx variegata</i>	4 +
03040	<i>Fredericella sp</i>	+	68708	<i>Dubiraphia vittata group</i>	16 +
03360	<i>Plumatella sp</i>	15 +	68901	<i>Macronychus glabratus</i>	14 +
03600	<i>Oligochaeta</i>	48 +	69400	<i>Stenelmis sp</i>	12 +
06201	<i>Hyalella azteca</i>	+	71100	<i>Hexatoma sp</i>	+
08255	<i>Orconectes rusticus x sanbornii</i>	+	72700	<i>Anopheles sp</i>	+
08601	<i>Hydrachnidia</i>	8	77120	<i>Ablabesmyia mallochi</i>	17 +
11130	<i>Baetis intercalaris</i>	+	77750	<i>Hayesomyia senata or Thienemannimyia norena</i>	17
11150	<i>Pseudocloeon propinquum</i>	+			
12200	<i>Isonychia sp</i>	58 +	77800	<i>Helopelopia sp</i>	17
13400	<i>Stenacron sp</i>	57 +	78450	<i>Nilotanypus fimbriatus</i>	17
13510	<i>Maccaffertium exiguum</i>	10	80310	<i>Cardiocladius obscurus</i>	+
13521	<i>Stenonema femoratum</i>	+	80360	<i>Corynoneura "celeripes" (sensu Simpson &amp; Bode, 1980)</i>	24
13561	<i>Maccaffertium pulchellum</i>	36 +	80370	<i>Corynoneura lobata</i>	86
13570	<i>Maccaffertium terminatum</i>	17	80427	<i>Cricotopus (C.) politus</i>	+
13590	<i>Maccaffertium vicarium</i>	510 +	81231	<i>Nanocladius (N.) crassicornus or N. (N.) "rectinervis"</i>	17
15000	<i>Paraleptophlebia sp</i>	32 +	81270	<i>Nanocladius (N.) spiniplenus</i>	17
17200	<i>Caenis sp</i>	+	81825	<i>Rheocricotopus (Psilocricotopus) robacki</i>	+
18600	<i>Ephemera sp</i>	2	82121	<i>Thienemanniella lobapodema</i>	75
18708	<i>Hexagenia bilineata</i>	+	82730	<i>Chironomus (C.) decorus group</i>	+
21200	<i>Calopteryx sp</i>	+	82820	<i>Cryptochironomus sp</i>	+
22001	<i>Coenagrionidae</i>	+	83820	<i>Microtendipes "caelum" (sensu Simpson &amp; Bode, 1980)</i>	+
22300	<i>Argia sp</i>	4	83840	<i>Microtendipes pedellus group</i>	+
23905	<i>Boyeria grafiana</i>	+	84210	<i>Paratendipes albimanus or P. duplicatus</i>	+
23909	<i>Boyeria vinosa</i>	1 +	84300	<i>Phaenopsectra obediens group</i>	+
33100	<i>Leuctra sp</i>	+	84450	<i>Polypedilum (Uresipedilum) flavum</i>	105 +
34130	<i>Acroneuria frisoni</i>	1 +	84460	<i>Polypedilum (P.) fallax group</i>	17
44501	<i>Corixidae</i>	+	84470	<i>Polypedilum (P.) illinoense</i>	55
47600	<i>Sialis sp</i>	+	84700	<i>Stenochironomus sp</i>	55
48410	<i>Corydalus cornutus</i>	1	84750	<i>Stictochironomus sp</i>	+
50315	<i>Chimarra obscura</i>	1 +	84800	<i>Tribelos jucundum</i>	+
51600	<i>Polycentropus sp</i>	+	85500	<i>Paratanytarsus sp</i>	+
52200	<i>Cheumatopsyche sp</i>	26 +	85615	<i>Rheotanytarsus pellucidus</i>	55 +
52430	<i>Ceratopsyche morosa group</i>	9 +	85625	<i>Rheotanytarsus sp</i>	1564 +
52530	<i>Hydropsyche depravata group</i>	+	85802	<i>Tanytarsus curticornis</i>	55
53800	<i>Hydroptila sp</i>	+	85821	<i>Tanytarsus glabrescens group sp 7</i>	88 +
57900	<i>Pycnopsyche sp</i>	+	85840	<i>Tanytarsus sepp</i>	249 +
59580	<i>Oecetis persimilis</i>	8	86200	<i>Tabanus sp</i>	+
60300	<i>Dineutus sp</i>	2 +	87540	<i>Hemerodromia sp</i>	44 +
60400	<i>Gyrinus sp</i>	+	94400	<i>Fossaria sp</i>	1
60900	<i>Peltodytes sp</i>	+	95100	<i>Physella sp</i>	+
63300	<i>Hydroporini</i>	+			
63900	<i>Laccophilus sp</i>	+			

**Ohio EPA/DSW Ecological Assessment Section  
Macroinvertebrate Collection**

Site: Salt Creek  
dst. U.S. Rt. 40

Collection Date: 08/14/2008 River Code: 17-940 RM: 12.70

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Taxa Code	Taxa	Quant/Qual	Taxa Code	Taxa	Quant/Qual
96900	<i>Ferrissia sp</i>	86 +			

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No. Quantitative Taxa: 47      Total Taxa: 86

No. Qualitative Taxa: 66      ICI: **52**

Number of Organisms: 3582      Qual EPT: 19

Ohio EPA/DSW Ecological Assessment Section  
Macroinvertebrate Collection

Site: Salt Creek

Collection Date: 09/26/2008 River Code: 17-940 RM: 5.60

dst. St. Rt. 146

Taxa Code	Taxa	Quant/Qual	Taxa Code	Taxa	Quant/Qual
01801	<i>Turbellaria</i>	5	77800	<i>Helopelopia sp</i>	9
03600	<i>Oligochaeta</i>	99 +	78350	<i>Meropelopia sp</i>	18
08260	<i>Orconectes (Crockerinus) sanbornii sanbornii</i>	+	80420	<i>Cricotopus (C.) bicinctus</i>	9 +
08601	<i>Hydrachnidia</i>	339	81231	<i>Nanocladius (N.) crassicornus or N. (N.) "rectinervis"</i>	9
11130	<i>Baetis intercalaris</i>	4 +	81270	<i>Nanocladius (N.) spiniplenus</i>	9
12200	<i>Isonychia sp</i>	83 +	81690	<i>Paratrichocladius sp</i>	18
13100	<i>Nixe sp</i>	+	81825	<i>Rheocricotopus (Psilocricotopus) robacki</i>	152 +
13400	<i>Stenacron sp</i>	+	83820	<i>Microtendipes "caelum" (sensu Simpson &amp; Bode, 1980)</i>	36
13510	<i>Maccaffertium exiguum</i>	10	84450	<i>Polypedilum (Uresipedilum) flavum</i>	+
13561	<i>Maccaffertium pulchellum</i>	46	84540	<i>Polypedilum (Tripodura) scalaenum group</i>	18
13570	<i>Maccaffertium terminatum</i>	2	84750	<i>Stictochironomus sp</i>	+
13590	<i>Maccaffertium vicarium</i>	134 +	85625	<i>Rheotanytarsus sp</i>	27 +
14950	<i>Leptophlebia sp or Paraleptophlebia sp</i>	1 +	85800	<i>Tanytarsus sp</i>	18 +
16700	<i>Tricorythodes sp</i>	5	85821	<i>Tanytarsus glabrescens group sp 7</i>	9 +
18708	<i>Hexagenia bilineata</i>	+	85840	<i>Tanytarsus sepp</i>	9 +
23909	<i>Boyeria vinosa</i>	+	86401	<i>Atherix lantha</i>	2
24900	<i>Gomphus sp</i>	+	87540	<i>Hemerodromia sp</i>	544 +
25510	<i>Stylogomphus albistylus</i>	+	96900	<i>Ferrissia sp</i>	5 +
26700	<i>Macromia sp</i>	+	97601	<i>Corbicula fluminea</i>	4 +
34130	<i>Acroneuria frisoni</i>	+			
47600	<i>Sialis sp</i>	+	No. Quantitative Taxa: 43		Total Taxa: 63
48410	<i>Corydalus cornutus</i>	6 +	No. Qualitative Taxa: 43		ICI: 40
50315	<i>Chimarra obscura</i>	49 +	Number of Organisms: 2409		Qual EPT: 15
51600	<i>Polycentropus sp</i>	+			
52200	<i>Cheumatopsyche sp</i>	103 +			
52430	<i>Ceratopsyche morosa group</i>	32 +			
52530	<i>Hydropsyche depravata group</i>	4			
52570	<i>Hydropsyche simulans</i>	9 +			
57900	<i>Pycnopsyche sp</i>	+			
59580	<i>Oecetis persimilis</i>	9			
59720	<i>Triaenodes ignitus</i>	+			
60300	<i>Dineutus sp</i>	+			
63300	<i>Hydroporini</i>	+			
68130	<i>Helichus sp</i>	+			
68601	<i>Ancyronyx variegata</i>	2 +			
68708	<i>Dubiraphia vittata group</i>	9 +			
68901	<i>Macronychus glabratus</i>	110 +			
69400	<i>Stenelmis sp</i>	13 +			
70600	<i>Antocha sp</i>	1			
71910	<i>Tipula abdominalis</i>	2			
72340	<i>Dixella sp</i>	+			
74100	<i>Simulium sp</i>	+			
74501	<i>Ceratopogonidae</i>	16			
77750	<i>Hayesomyia senata or Thienemannimyia norena</i>	420			

**Ohio EPA/DSW Ecological Assessment Section  
Macroinvertebrate Collection**

Site: Salt Creek  
upst/dst. Manns Fork

Collection Date: 08/19/2008 River Code: 17-940 RM: 2.10

Taxa Code	Taxa	Quant/Qual	Taxa Code	Taxa	Quant/Qual
03600	<i>Oligochaeta</i>	+			
08260	<i>Orconectes (Crockerinus) sanbornii sanbornii</i>	+	No. Quantitative Taxa: 0		Total Taxa: 44
11130	<i>Baetis intercalaris</i>	+	No. Qualitative Taxa: 44		ICI:
11150	<i>Pseudocloeon propinquum</i>	+	Number of Organisms: 0		Qual EPT: 16
11600	<i>Paracloeodes fleeki</i>	+			
12200	<i>Isonychia sp</i>	+			
13100	<i>Nixe sp</i>	+			
13400	<i>Stenacron sp</i>	+			
13510	<i>Maccaffertium exiguum</i>	+			
13521	<i>Stenonema femoratum</i>	+			
13561	<i>Maccaffertium pulchellum</i>	+			
13590	<i>Maccaffertium vicarium</i>	+			
16700	<i>Tricorythodes sp</i>	+			
18750	<i>Hexagenia limbata</i>	+			
21200	<i>Calopteryx sp</i>	+			
23909	<i>Boyeria vinosa</i>	+			
24900	<i>Gomphus sp</i>	+			
26700	<i>Macromia sp</i>	+			
47600	<i>Sialis sp</i>	+			
50315	<i>Chimarra obscura</i>	+			
52200	<i>Cheumatopsyche sp</i>	+			
52430	<i>Ceratopsyche morosa group</i>	+			
52570	<i>Hydropsyche simulans</i>	+			
60300	<i>Dineutus sp</i>	+			
63300	<i>Hydroporini</i>	+			
66500	<i>Enochrus sp</i>	+			
67000	<i>Helophorus sp</i>	+			
67800	<i>Tropisternus sp</i>	+			
68130	<i>Helichus sp</i>	+			
68901	<i>Macronychus glabratus</i>	+			
71900	<i>Tipula sp</i>	+			
77500	<i>Conchapelopia sp</i>	+			
77750	<i>Hayesomyia senata or Thienemannimyia norena</i>	+			
80410	<i>Cricotopus (C.) sp</i>	+			
80420	<i>Cricotopus (C.) bicinctus</i>	+			
81825	<i>Rheocricotopus (Psilocricotopus) robacki</i>	+			
84450	<i>Polypedilum (Uresipedilum) flavum</i>	+			
84470	<i>Polypedilum (P.) illinoense</i>	+			
84480	<i>Polypedilum (P.) laetum group</i>	+			
84750	<i>Stictochironomus sp</i>	+			
85625	<i>Rheotanytarsus sp</i>	+			
85800	<i>Tanytarsus sp</i>	+			
87540	<i>Hemerodromia sp</i>	+			
97601	<i>Corbicula fluminea</i>	+			



**Ohio EPA/DSW Ecological Assessment Section  
Macroinvertebrate Collection**

Site: Manns Fork  
adj. Cutler Lake Rd.

Collection Date: 08/04/2008 River Code: 17-941 RM: 4.10

Taxa Code	Taxa	Quant/Qual	Taxa Code	Taxa	Quant/Qual
08260	<i>Orconectes (Crockerinus) sanbornii sanbornii</i>	+	84315	<i>Phaenopsectra flavipes</i>	+
11120	<i>Baetis flavistriga</i>	+	84450	<i>Polypedilum (Uresipedilum) flavum</i>	+
11125	<i>Pseudocloeon frondale</i>	+	84470	<i>Polypedilum (P.) illinoense</i>	+
11130	<i>Baetis intercalaris</i>	+	85500	<i>Paratanytarsus sp</i>	+
11650	<i>Procloeon sp (w/ hindwing pads)</i>	+	85625	<i>Rheotanytarsus sp</i>	+
13400	<i>Stenacron sp</i>	+	87540	<i>Hemerodromia sp</i>	+
13521	<i>Stenonema femoratum</i>	+	93900	<i>Elimia sp</i>	+
13590	<i>Maccaffertium vicarium</i>	+	95100	<i>Physella sp</i>	+
14600	<i>Choroterpes sp</i>	+	96900	<i>Ferrissia sp</i>	+
17200	<i>Caenis sp</i>	+			
21200	<i>Calopteryx sp</i>	+	No. Quantitative Taxa: 0		Total Taxa: 52
22001	<i>Coenagrionidae</i>	+	No. Qualitative Taxa: 52		ICI:
23909	<i>Boyeria vinosa</i>	+	Number of Organisms: 0		Qual EPT: 18
25510	<i>Stylogomphus albistylus</i>	+			
27500	<i>Somatochlora sp</i>	+			
34130	<i>Acroneuria frisoni</i>	+			
50301	<i>Chimarra aterrima</i>	+			
51400	<i>Nyctiophylax sp</i>	+			
51600	<i>Polycentropus sp</i>	+			
52200	<i>Cheumatopsyche sp</i>	+			
52430	<i>Ceratopsyche morosa group</i>	+			
52440	<i>Ceratopsyche slossonae</i>	+			
52530	<i>Hydropsyche depravata group</i>	+			
53800	<i>Hydroptila sp</i>	+			
60900	<i>Peltodytes sp</i>	+			
63300	<i>Hydroporini</i>	+			
66500	<i>Enochrus sp</i>	+			
67800	<i>Tropisternus sp</i>	+			
68075	<i>Psephenus herricki</i>	+			
68130	<i>Helichus sp</i>	+			
68708	<i>Dubiraphia vittata group</i>	+			
69400	<i>Stenelmis sp</i>	+			
71100	<i>Hexatoma sp</i>	+			
71900	<i>Tipula sp</i>	+			
72340	<i>Dixella sp</i>	+			
72700	<i>Anopheles sp</i>	+			
74100	<i>Simulium sp</i>	+			
77750	<i>Hayesomyia senata or Thienemannimyia norena</i>	+			
80420	<i>Cricotopus (C.) bicinctus</i>	+			
81825	<i>Rheocricotopus (Psilocricotopus) robacki</i>	+			
82200	<i>Tvetenia bavarica group</i>	+			
83003	<i>Dicrotendipes fumidus</i>	+			
83820	<i>Microtendipes "caelum" (sensu Simpson &amp; Bode, 1980)</i>	+			

Ohio EPA/DSW Ecological Assessment Section  
 Macroinvertebrate Collection

Site: Manns Fork  
 upst. Mock Drive

Collection Date: 08/12/2008 River Code: 17-941 RM: 2.40

Taxa Code	Taxa	Quant/Qual	Taxa Code	Taxa	Quant/Qual
03360	<i>Plumatella sp</i>	+	81650	<i>Parametriocnemus sp</i>	14 +
03600	<i>Oligochaeta</i>	70 +	82121	<i>Thienemanniella lobapodema</i>	29
08260	<i>Orconectes (Crockerinus) sanbornii sanbornii</i>	+	82141	<i>Thienemanniella xena</i>	+
11120	<i>Baetis flavistriga</i>	+	82730	<i>Chironomus (C.) decorus group</i>	+
11130	<i>Baetis intercalaris</i>	+	83040	<i>Dicrotendipes neomodestus</i>	72
11150	<i>Pseudocloeon propinquum</i>	+	84210	<i>Paratendipes albimanus or P. duplicatus</i>	72
11651	<i>Procloeon sp (w/o hindwing pads)</i>	7	84300	<i>Phaenopsectra obediens group</i>	72 +
13100	<i>Nixe sp</i>	+	84302	<i>Phaenopsectra punctipes</i>	14
13400	<i>Stenacron sp</i>	1 +	84450	<i>Polypedilum (Uresipedilum) flavum</i>	14 +
13521	<i>Stenonema femoratum</i>	9 +	84460	<i>Polypedilum (P.) fallax group</i>	72
13590	<i>Maccaffertium vicarium</i>	21 +	84470	<i>Polypedilum (P.) illinoense</i>	+
16200	<i>Eurylophella sp</i>	1	84540	<i>Polypedilum (Tripodura) scalaenum group</i>	130 +
17200	<i>Caenis sp</i>	17 +	85261	<i>Cladotanytarsus vanderwulpi group Type 1</i>	14
22300	<i>Argia sp</i>	1	85500	<i>Paratanytarsus sp</i>	29
23804	<i>Basiaeschna janata</i>	+	85625	<i>Rheotanytarsus sp</i>	130 +
23909	<i>Boyeria vinosa</i>	+	85800	<i>Tanytarsus sp</i>	29
24900	<i>Gomphus sp</i>	+	85821	<i>Tanytarsus glabrescens group sp 7</i>	130
34130	<i>Acroneuria frisoni</i>	5 +	85840	<i>Tanytarsus sepp</i>	101
43300	<i>Ranatra sp</i>	+	86200	<i>Tabanus sp</i>	+
48610	<i>Nigronia fasciatus</i>	1	87540	<i>Hemerodromia sp</i>	17
50315	<i>Chimarra obscura</i>	+	96900	<i>Ferrissia sp</i>	1 +
51600	<i>Polycentropus sp</i>	+			
52200	<i>Cheumatopsyche sp</i>	4 +	No. Quantitative Taxa: 38		Total Taxa: 65
52430	<i>Ceratopsyche morosa group</i>	2 +	No. Qualitative Taxa: 45		ICI: 40
52530	<i>Hydropsyche depravata group</i>	+	Number of Organisms: 1632		Qual EPT: 16
52540	<i>Hydropsyche dicantha</i>	+			
53800	<i>Hydroptila sp</i>	+			
60400	<i>Gyrinus sp</i>	+			
63300	<i>Hydroporini</i>	+			
68130	<i>Helichus sp</i>	+			
68601	<i>Ancyronyx variegata</i>	1			
69400	<i>Stenelmis sp</i>	2 +			
71100	<i>Hexatoma sp</i>	1 +			
72340	<i>Dixella sp</i>	+			
72700	<i>Anopheles sp</i>	+			
74100	<i>Simulium sp</i>	+			
77120	<i>Ablabesmyia mallochi</i>	+			
77500	<i>Conchapelopia sp</i>	58 +			
77800	<i>Helopelopia sp</i>	29			
78140	<i>Labrundinia pilosella</i>	14			
80351	<i>Corynoneura n.sp 1</i>	+			
80370	<i>Corynoneura lobata</i>	202			
80420	<i>Cricotopus (C.) bicinctus</i>	29 +			
80430	<i>Cricotopus (C.) tremulus group</i>	217			

Ohio EPA/DSW Ecological Assessment Section  
 Macroinvertebrate Collection

Site: Kent Run  
 Browning Rd.

Collection Date: 06/18/2009 River Code: 17-942 RM: 1.10

Taxa Code	Taxa	Quant/Qual	Taxa Code	Taxa	Quant/Qual
03600	<i>Oligochaeta</i>	+	83003	<i>Dicrotendipes fumidus</i>	+
07860	<i>Cambarus (Puncticambarus) robustus</i>	+	83040	<i>Dicrotendipes neomodestus</i>	+
08260	<i>Orconectes (Crockerinus) sanbornii sanbornii</i>	+	84210	<i>Paratendipes albimanus</i> or <i>P. duplicatus</i>	+
11119	<i>Plauditus dubius</i> or <i>P. virilis</i>	+	84450	<i>Polypedilum (Uresipedilum) flavum</i>	+
11120	<i>Baetis flavistriga</i>	+	84520	<i>Polypedilum (Tripodura) halterale</i> group	+
11130	<i>Baetis intercalaris</i>	+	85500	<i>Paratanytarsus sp</i>	+
11250	<i>Centroptilum sp (w/o hindwing pads)</i>	+	85625	<i>Rheotanytarsus sp</i>	+
11651	<i>Procloeon sp (w/o hindwing pads)</i>	+	85800	<i>Tanytarsus sp</i>	+
13000	<i>Leucrocuta sp</i>	+	85840	<i>Tanytarsus sepp</i>	+
13400	<i>Stenacron sp</i>	+	96900	<i>Ferrissia sp</i>	+
13521	<i>Stenonema femoratum</i>	+			
15000	<i>Paraleptophlebia sp</i>	+	No. Quantitative Taxa: 0		Total Taxa: 54
17200	<i>Caenis sp</i>	+	No. Qualitative Taxa: 54		ICI:
18750	<i>Hexagenia limbata</i>	+	Number of Organisms: 0		Qual EPT: 21
22001	<i>Coenagrionidae</i>	+			
22300	<i>Argia sp</i>	+			
23909	<i>Boyeria vinosa</i>	+			
33100	<i>Leuctra sp</i>	+			
34300	<i>Neoperla clymene</i> complex	+			
34500	<i>Perlesta placida</i> complex	+			
47600	<i>Sialis sp</i>	+			
50301	<i>Chimarra aterrima</i>	+			
51400	<i>Nyctiophylax sp</i>	+			
51600	<i>Polycentropus sp</i>	+			
52200	<i>Cheumatopsyche sp</i>	+			
52430	<i>Ceratopsyche morosa</i> group	+			
52530	<i>Hydropsyche depravata</i> group	+			
53800	<i>Hydroptila sp</i>	+			
65800	<i>Berosus sp</i>	+			
67750	<i>Sperchopsis tessellatus</i>	+			
68075	<i>Psephenus herricki</i>	+			
68708	<i>Dubiraphia vittata</i> group	+			
71100	<i>Hexatoma sp</i>	+			
71900	<i>Tipula sp</i>	+			
72700	<i>Anopheles sp</i>	+			
74501	<i>Ceratopogonidae</i>	+			
77120	<i>Ablabesmyia mallochi</i>	+			
77500	<i>Conchapelopia sp</i>	+			
77750	<i>Hayesomyia senata</i> or <i>Thienemannimyia norena</i>	+			
78655	<i>Procladius (Holotanypus) sp</i>	+			
79400	<i>Zavreliomyia sp</i>	+			
81650	<i>Parametriocnemus sp</i>	+			
81825	<i>Rheocricotopus (Psilocricotopus) robacki</i>	+			
82730	<i>Chironomus (C.) decorus</i> group	+			

Ohio EPA/DSW Ecological Assessment Section  
 Macroinvertebrate Collection

Site: Kent Run  
 dst. Browning Rd.

Collection Date: 06/15/2009 River Code: 17-942 RM: 0.80

Taxa Code	Taxa	Quant/Qual	Taxa Code	Taxa	Quant/Qual
03040	<i>Fredericella sp</i>	+	85821	<i>Tanytarsus glabrescens group sp 7</i>	+
07800	<i>Cambarus sp</i>	+	86200	<i>Tabanus sp</i>	+
08260	<i>Orconectes (Crockerinus) sanbornii sanbornii</i>	+	96900	<i>Ferrissia sp</i>	+
08601	<i>Hydrachnidia</i>	+			
11119	<i>Plauditus dubius or P. virilis</i>	+	No. Quantitative Taxa: 0		Total Taxa: 47
11120	<i>Baetis flavistriga</i>	+	No. Qualitative Taxa: 47		ICI:
11130	<i>Baetis intercalaris</i>	+	Number of Organisms: 0		Qual EPT: 23
11250	<i>Centroptilum sp (w/o hindwing pads)</i>	+			
13000	<i>Leucrocuta sp</i>	+			
13100	<i>Nixe sp</i>	+			
13400	<i>Stenacron sp</i>	+			
13521	<i>Stenonema femoratum</i>	+			
13561	<i>Maccaffertium pulchellum</i>	+			
15000	<i>Paraleptophlebia sp</i>	+			
17200	<i>Caenis sp</i>	+			
22300	<i>Argia sp</i>	+			
23909	<i>Boyeria vinosa</i>	+			
33100	<i>Leuctra sp</i>	+			
34130	<i>Acroneuria frisoni</i>	+			
34300	<i>Neoperla clymene complex</i>	+			
34500	<i>Perlesta placida complex</i>	+			
34715	<i>Agnatina flavescens</i>	+			
51400	<i>Nyctiophylax sp</i>	+			
51600	<i>Polycentropus sp</i>	+			
52200	<i>Cheumatopsyche sp</i>	+			
52430	<i>Ceratopsyche morosa group</i>	+			
53800	<i>Hydroptila sp</i>	+			
57400	<i>Neophylax sp</i>	+			
57900	<i>Pycnopsyche sp</i>	+			
68130	<i>Helichus sp</i>	+			
69400	<i>Stenelmis sp</i>	+			
71100	<i>Hexatoma sp</i>	+			
71900	<i>Tipula sp</i>	+			
77500	<i>Conchapelopia sp</i>	+			
80410	<i>Cricotopus (C.) sp</i>	+			
81825	<i>Rheocricotopus (Psilocricotopus) robacki</i>	+			
82820	<i>Cryptochironomus sp</i>	+			
83040	<i>Dicrotendipes neomodestus</i>	+			
83820	<i>Microtendipes "caelum" (sensu Simpson &amp; Bode, 1980)</i>	+			
83840	<i>Microtendipes pedellus group</i>	+			
84300	<i>Phaenopsectra obediens group</i>	+			
84315	<i>Phaenopsectra flavipes</i>	+			
85500	<i>Paratanytarsus sp</i>	+			
85625	<i>Rheotanytarsus sp</i>	+			

**Ohio EPA/DSW Ecological Assessment Section  
Macroinvertebrate Collection**

Site: Kent Run  
Browning Rd.

Collection Date: 08/04/2008 River Code: 17-942 RM: 1.10

Taxa Code	Taxa	Quant/Qual	Taxa Code	Taxa	Quant/Qual
07860	<i>Cambarus (Puncticambarus) robustus</i>	+			
08260	<i>Orconectes (Crockerinus) sanbornii sanbornii</i>	+			
08601	<i>Hydrachnidia</i>	+			
11120	<i>Baetis flavistriga</i>	+			
11250	<i>Centroptilum sp (w/o hindwing pads)</i>	+			
13521	<i>Stenonema femoratum</i>	+			
17200	<i>Caenis sp</i>	+			
21200	<i>Calopteryx sp</i>	+			
22001	<i>Coenagrionidae</i>	+			
22300	<i>Argia sp</i>	+			
27500	<i>Somatochlora sp</i>	+			
33100	<i>Leuctra sp</i>	+			
34130	<i>Acroneuria frisoni</i>	+			
48620	<i>Nigronia serricornis</i>	+			
51400	<i>Nyctiophylax sp</i>	+			
51600	<i>Polycentropus sp</i>	+			
52200	<i>Cheumatopsyche sp</i>	+			
52430	<i>Ceratopsyche morosa group</i>	+			
52530	<i>Hydropsyche depravata group</i>	+			
53800	<i>Hydroptila sp</i>	+			
59728	<i>Triaenodes marginatus</i>	+			
66200	<i>Cymbiodyta sp</i>	+			
66500	<i>Enochrus sp</i>	+			
68130	<i>Helichus sp</i>	+			
69400	<i>Stenelmis sp</i>	+			
71100	<i>Hexatoma sp</i>	+			
71800	<i>Pseudolimnophila sp</i>	+			
77120	<i>Ablabesmyia mallochi</i>	+			
78601	<i>Pentaneura Type 1</i>	+			
79400	<i>Zavreliomyia sp</i>	+			
80370	<i>Corynoneura lobata</i>	+			
80400	<i>Cricotopus sp</i>	+			
80420	<i>Cricotopus (C.) bicinctus</i>	+			
83900	<i>Nilothauma sp</i>	+			
84450	<i>Polypedilum (Uresipedilum) flavum</i>	+			
84470	<i>Polypedilum (P.) illinoense</i>	+			
85625	<i>Rheotanytarsus sp</i>	+			
85821	<i>Tanytarsus glabrescens group sp 7</i>	+			
95100	<i>Physella sp</i>	+			
96900	<i>Ferrissia sp</i>	+			

No. Quantitative Taxa: 0                      Total Taxa: 40  
 No. Qualitative Taxa: 40                      ICI:  
 Number of Organisms: 0                      Qual EPT: 13

Ohio EPA/DSW Ecological Assessment Section  
 Macroinvertebrate Collection

Site: Boggs Creek  
 upst. St. Rt. 146

Collection Date: 08/06/2008 River Code: 17-943 RM: 4.10

Taxa Code	Taxa	Quant/Qual	Taxa Code	Taxa	Quant/Qual
03301	<i>Plumatellidae</i>	+	82141	<i>Thienemanniella xena</i>	+
03600	<i>Oligochaeta</i>	+	82600	<i>Axarus sp</i>	+
04685	<i>Placobdella ornata</i>	+	82730	<i>Chironomus (C.) decorus group</i>	+
06201	<i>Hyaella azteca</i>	+	84210	<i>Paratendipes albimanus or P. duplicatus</i>	+
07860	<i>Cambarus (Puncticambarus) robustus</i>	+	84450	<i>Polypedilum (Uresipedilum) flavum</i>	+
08260	<i>Orconectes (Crockerinus) sanbornii sanbornii</i>	+	84460	<i>Polypedilum (P.) fallax group</i>	+
11130	<i>Baetis intercalaris</i>	+	84470	<i>Polypedilum (P.) illinoense</i>	+
11150	<i>Pseudocloeon propinquum</i>	+	84540	<i>Polypedilum (Tripodura) scalaenum group</i>	+
11200	<i>Callibaetis sp</i>	+	84800	<i>Tribelos jucundum</i>	+
12200	<i>Isonychia sp</i>	+	85500	<i>Paratanytarsus sp</i>	+
13400	<i>Stenacron sp</i>	+	85625	<i>Rheotanytarsus sp</i>	+
17200	<i>Caenis sp</i>	+	85800	<i>Tanytarsus sp</i>	+
21200	<i>Calopteryx sp</i>	+	85840	<i>Tanytarsus sepp</i>	+
22001	<i>Coenagrionidae</i>	+	87540	<i>Hemerodromia sp</i>	+
22300	<i>Argia sp</i>	+	95100	<i>Physella sp</i>	+
23909	<i>Boyeria vinosa</i>	+			
24501	<i>Gomphidae</i>	+	No. Quantitative Taxa: 0		Total Taxa: 59
45300	<i>Sigara sp</i>	+	No. Qualitative Taxa: 59		ICI:
51600	<i>Polycentropus sp</i>	+	Number of Organisms: 0		Qual EPT: 11
52200	<i>Cheumatopsyche sp</i>	+			
52430	<i>Ceratopsyche morosa group</i>	+			
52530	<i>Hydropsyche depravata group</i>	+			
57900	<i>Pycnopsyche sp</i>	+			
60400	<i>Gyrinus sp</i>	+			
63300	<i>Hydroporini</i>	+			
67000	<i>Helophorus sp</i>	+			
67700	<i>Paracymus sp</i>	+			
67800	<i>Tropisternus sp</i>	+			
68130	<i>Helichus sp</i>	+			
68300	<i>Cyphon sp</i>	+			
68708	<i>Dubiraphia vittata group</i>	+			
68901	<i>Macronychus glabratus</i>	+			
69400	<i>Stenelmis sp</i>	+			
71100	<i>Hexatoma sp</i>	+			
72340	<i>Dixella sp</i>	+			
72700	<i>Anopheles sp</i>	+			
74100	<i>Simulium sp</i>	+			
77500	<i>Conchapelopia sp</i>	+			
77750	<i>Hayesomyia senata or Thienemannimyia norena</i>	+			
77800	<i>Helopelopia sp</i>	+			
78140	<i>Labrundinia pilosella</i>	+			
78655	<i>Procladius (Holotanypus) sp</i>	+			
80420	<i>Cricotopus (C.) bicinctus</i>	+			
81825	<i>Rheocricotopus (Psilocricotopus) robacki</i>	+			

Ohio EPA/DSW Ecological Assessment Section  
 Macroinvertebrate Collection

Site: Boggs Creek  
 Salt Creek Drive

Collection Date: 08/11/2008 River Code: 17-943 RM: 1.00

Taxa Code	Taxa	Quant/Qual	Taxa Code	Taxa	Quant/Qual
00653	<i>Eunapius fragilis</i>	+	80420	<i>Cricotopus (C.) bicinctus</i>	+
01801	<i>Turbellaria</i>	9	80430	<i>Cricotopus (C.) tremulus group</i>	25
03600	<i>Oligochaeta</i>	101	80440	<i>Cricotopus (C.) trifascia</i>	+
06201	<i>Hyalella azteca</i>	+	81231	<i>Nanocladius (N.) crassicornus or N. (N.) "rectinervis"</i>	+
08260	<i>Orconectes (Crokerinus) sanbornii sanbornii</i>	+	82121	<i>Thienemanniella lobapodema</i>	68 +
11120	<i>Baetis flavistriga</i>	+	82820	<i>Cryptochironomus sp</i>	+
11130	<i>Baetis intercalaris</i>	+	83040	<i>Dicrotendipes neomodestus</i>	63
11200	<i>Callibaetis sp</i>	+	83050	<i>Dicrotendipes lucifer</i>	13
11250	<i>Centroptilum sp (w/o hindwing pads)</i>	+	83820	<i>Microtendipes "caelum" (sensu Simpson &amp; Bode, 1980)</i>	38
11650	<i>Procloeon sp (w/ hindwing pads)</i>	1 +	84210	<i>Paratendipes albimanus or P. duplicatus</i>	+
11651	<i>Procloeon sp (w/o hindwing pads)</i>	1	84300	<i>Phaenopsectra obediens group</i>	38 +
13400	<i>Stenacron sp</i>	195 +	84315	<i>Phaenopsectra flavipes</i>	13
13521	<i>Stenonema femoratum</i>	3 +	84450	<i>Polypedilum (Uresipedilum) flavum</i>	13 +
13561	<i>Maccaffertium pulchellum</i>	1	84460	<i>Polypedilum (P.) fallax group</i>	13
14950	<i>Leptophlebia sp or Paraleptophlebia sp</i>	10	84540	<i>Polypedilum (Tripodura) scalaenum group</i>	25 +
17200	<i>Caenis sp</i>	17 +	84601	<i>Saetheria species 1 (sensu Jackson, 1977)</i>	+
21200	<i>Calopteryx sp</i>	1 +	84888	<i>Xenochironomus xenolabis</i>	+
22001	<i>Coenagrionidae</i>	+	85261	<i>Cladotanytarsus vanderwulpi group Type 1</i>	+
22300	<i>Argia sp</i>	+	85500	<i>Paratanytarsus sp</i>	25
23909	<i>Boyeria vinosa</i>	+	85625	<i>Rheotanytarsus sp</i>	13 +
30000	<i>Plecoptera</i>	+	85800	<i>Tanytarsus sp</i>	38 +
49200	<i>Climacia sp</i>	+	85821	<i>Tanytarsus glabrescens group sp 7</i>	365 +
51600	<i>Polycentropus sp</i>	+	85840	<i>Tanytarsus sepp</i>	302 +
52200	<i>Cheumatopsyche sp</i>	2 +	95100	<i>Physella sp</i>	+
52430	<i>Ceratopsyche morosa group</i>	+	96900	<i>Ferrissia sp</i>	8
52530	<i>Hydropsyche depravata group</i>	+			
52540	<i>Hydropsyche dicantha</i>	+			
53800	<i>Hydroptila sp</i>	+			
60300	<i>Dineutus sp</i>	+	No. Quantitative Taxa: 33		Total Taxa: 69
63300	<i>Hydroporini</i>	+	No. Qualitative Taxa: 53		ICI: 44
63900	<i>Laccophilus sp</i>	+	Number of Organisms: 1576		Qual EPT: 15
67800	<i>Tropisternus sp</i>	+			
68130	<i>Helichus sp</i>	+			
68700	<i>Dubiraphia sp</i>	1 +			
68901	<i>Macronychus glabratus</i>	3			
69400	<i>Stenelmis sp</i>	4 +			
71000	<i>Helius sp</i>	+			
72700	<i>Anopheles sp</i>	+			
74100	<i>Simulium sp</i>	+			
77001	<i>Tanypodinae</i>	+			
77115	<i>Ablabesmyia janta</i>	+			
77120	<i>Ablabesmyia mallochi</i>	88 +			
77800	<i>Helopelopia sp</i>	25			
80370	<i>Corynoneura lobata</i>	54			

Ohio EPA/DSW Ecological Assessment Section  
 Macroinvertebrate Collection

Site: Indian Run  
 at mouth

Collection Date: 08/06/2008 River Code: 17-944 RM: 0.10

Taxa Code	Taxa	Quant/Qual	Taxa Code	Taxa	Quant/Qual
01801	<i>Turbellaria</i>	+	78401	<i>Natarsia species A (sensu Roback, 1978)</i>	+
03360	<i>Plumatella sp</i>	+	82101	<i>Thienemanniella taurocapita</i>	+
05800	<i>Caecidotea sp</i>	+	82730	<i>Chironomus (C.) decorus group</i>	+
06201	<i>Hyalella azteca</i>	+	82820	<i>Cryptochironomus sp</i>	+
08260	<i>Orconectes (Crockerinus) sanbornii sanbornii</i>	+	83040	<i>Dicrotendipes neomodestus</i>	+
08601	<i>Hydrachnidia</i>	+	83158	<i>Endochironomus nigricans</i>	+
11125	<i>Pseudocloeon frondale</i>	+	83820	<i>Microtendipes "caelum" (sensu Simpson &amp; Bode, 1980)</i>	+
11200	<i>Callibaetis sp</i>	+	84040	<i>Parachironomus frequens</i>	+
13400	<i>Stenacron sp</i>	+	84300	<i>Phaenopsectra obediens group</i>	+
13521	<i>Stenonema femoratum</i>	+	84450	<i>Polypedilum (Uresipedilum) flavum</i>	+
17200	<i>Caenis sp</i>	+	84470	<i>Polypedilum (P.) illinoense</i>	+
22001	<i>Coenagrionidae</i>	+	84750	<i>Stictochironomus sp</i>	+
22300	<i>Argia sp</i>	+	84800	<i>Tribelos jucundum</i>	+
23804	<i>Basiaeschna janata</i>	+	85230	<i>Cladotanytarsus mancus group</i>	+
45100	<i>Palmacorixa sp</i>	+	85500	<i>Paratanytarsus sp</i>	+
47600	<i>Sialis sp</i>	+	85625	<i>Rheotanytarsus sp</i>	+
48410	<i>Corydalus cornutus</i>	+	85821	<i>Tanytarsus glabrescens group sp 7</i>	+
50315	<i>Chimarra obscura</i>	+	85840	<i>Tanytarsus sepp</i>	+
51400	<i>Nyctiophylax sp</i>	+	95100	<i>Physella sp</i>	+
51600	<i>Polycentropus sp</i>	+	98600	<i>Sphaerium sp</i>	+
52200	<i>Cheumatopsyche sp</i>	+			
52430	<i>Ceratopsyche morosa group</i>	+			
52530	<i>Hydropsyche depravata group</i>	+	No. Quantitative Taxa: 0	Total Taxa: 64	
53800	<i>Hydroptila sp</i>	+	No. Qualitative Taxa: 64	ICI:	
60400	<i>Gyrinus sp</i>	+	Number of Organisms: 0	Qual EPT: 12	
60900	<i>Peltodytes sp</i>	+			
63300	<i>Hydroporini</i>	+			
63900	<i>Laccophilus sp</i>	+			
64050	<i>Liodessus sp</i>	+			
64700	<i>Thermonectus sp</i>	+			
66500	<i>Enochrus sp</i>	+			
67800	<i>Tropisternus sp</i>	+			
68130	<i>Helichus sp</i>	+			
68300	<i>Cyphon sp</i>	+			
68708	<i>Dubiraphia vittata group</i>	+			
68901	<i>Macronychus glabratus</i>	+			
71100	<i>Hexatoma sp</i>	+			
72340	<i>Dixella sp</i>	+			
72700	<i>Anopheles sp</i>	+			
74501	<i>Ceratopogonidae</i>	+			
77120	<i>Ablabesmyia mallochi</i>	+			
77500	<i>Conchapelopia sp</i>	+			
77800	<i>Helopelopia sp</i>	+			
78350	<i>Meropelopia sp</i>	+			



Ohio EPA/DSW Ecological Assessment Section  
 Macroinvertebrate Collection

Site: Buffalo Fork  
 Leedom Rd.

Collection Date: 08/04/2008 River Code: 17-945 RM: 6.60

Taxa Code	Taxa	Quant/Qual	Taxa Code	Taxa	Quant/Qual
08260	<i>Orconectes (Crockerinus) sanbornii sanbornii</i>	+	84450	<i>Polypedilum (Uresipedilum) flavum</i>	+
11130	<i>Baetis intercalaris</i>	+	84470	<i>Polypedilum (P.) illinoense</i>	+
11150	<i>Pseudocloeon propinquum</i>	+	85500	<i>Paratanytarsus sp</i>	+
11200	<i>Callibaetis sp</i>	+	85615	<i>Rheotanytarsus pellucidus</i>	+
11250	<i>Centroptilum sp (w/o hindwing pads)</i>	+	85625	<i>Rheotanytarsus sp</i>	+
11650	<i>Procloeon sp (w/ hindwing pads)</i>	+	85821	<i>Tanytarsus glabrescens group sp 7</i>	+
13400	<i>Stenacron sp</i>	+	86200	<i>Tabanus sp</i>	+
13521	<i>Stenonema femoratum</i>	+	87540	<i>Hemerodromia sp</i>	+
17200	<i>Caenis sp</i>	+			
21200	<i>Calopteryx sp</i>	+	No. Quantitative Taxa: 0		Total Taxa: 52
22001	<i>Coenagrionidae</i>	+	No. Qualitative Taxa: 52		ICI:
23909	<i>Boyeria vinosa</i>	+	Number of Organisms: 0		Qual EPT: 16
27500	<i>Somatochlora sp</i>	+			
33100	<i>Leuctra sp</i>	+			
34001	<i>Perlidae</i>	+			
50315	<i>Chimarra obscura</i>	+			
51600	<i>Polycentropus sp</i>	+			
52200	<i>Cheumatopsyche sp</i>	+			
52430	<i>Ceratopsyche morosa group</i>	+			
52570	<i>Hydropsyche simulans</i>	+			
53800	<i>Hydroptila sp</i>	+			
60300	<i>Dineutus sp</i>	+			
60400	<i>Gyrinus sp</i>	+			
60900	<i>Peltodytes sp</i>	+			
66500	<i>Enochrus sp</i>	+			
67700	<i>Paracymus sp</i>	+			
68130	<i>Helichus sp</i>	+			
68300	<i>Cyphon sp</i>	+			
69400	<i>Stenelmis sp</i>	+			
71100	<i>Hexatoma sp</i>	+			
72340	<i>Dixella sp</i>	+			
72700	<i>Anopheles sp</i>	+			
74100	<i>Simulium sp</i>	+			
77500	<i>Conchapelopia sp</i>	+			
77750	<i>Hayesomyia senata or Thienemannimyia norena</i>	+			
78655	<i>Procladius (Holotanypus) sp</i>	+			
80420	<i>Cricotopus (C.) bicinctus</i>	+			
80430	<i>Cricotopus (C.) tremulus group</i>	+			
80440	<i>Cricotopus (C.) trifascia</i>	+			
81650	<i>Parametriocnemus sp</i>	+			
81825	<i>Rheocricotopus (Psilocricotopus) robacki</i>	+			
82730	<i>Chironomus (C.) decorus group</i>	+			
83003	<i>Dicrotendipes fumidus</i>	+			
84300	<i>Phaenopsectra obediens group</i>	+			

Ohio EPA/DW/ Ecological Assessment Section  
 Macroinvertebrate Collection

Site: Buffalo Fork  
 Okey Rd.

Collection Date: 08/11/2008 River Code: 17-945 RM: 2.10

Taxa Code	Taxa	Quant/Qual	Taxa Code	Taxa	Quant/Qual
01801	<i>Turbellaria</i>	+	82600	<i>Axarus sp</i>	+
03360	<i>Plumatella sp</i>	+	82820	<i>Cryptochironomus sp</i>	+
04685	<i>Placobdella ornata</i>	+	83300	<i>Glyptotendipes (G.) sp</i>	+
06201	<i>Hyalella azteca</i>	+	83840	<i>Microtendipes pedellus group</i>	+
08260	<i>Orconectes (Crockerinus) sanbornii sanbornii</i>	+	84300	<i>Phaenopsectra obediens group</i>	+
08601	<i>Hydrachnidia</i>	+	84450	<i>Polypedilum (Uresipedilum) flavum</i>	+
11130	<i>Baetis intercalaris</i>	+	84750	<i>Stictochironomus sp</i>	+
11200	<i>Callibaetis sp</i>	+	85261	<i>Cladotanytarsus vanderwulpi group Type 1</i>	+
11250	<i>Centroptilum sp (w/o hindwing pads)</i>	+	85500	<i>Paratanytarsus sp</i>	+
11670	<i>Procloeon viridoculare</i>	+	85625	<i>Rheotanytarsus sp</i>	+
12200	<i>Isonychia sp</i>	+	85800	<i>Tanytarsus sp</i>	+
13400	<i>Stenacron sp</i>	+	85821	<i>Tanytarsus glabrescens group sp 7</i>	+
13521	<i>Stenonema femoratum</i>	+	95100	<i>Physella sp</i>	+
13590	<i>Maccaffertium vicarium</i>	+	98600	<i>Sphaerium sp</i>	+
17200	<i>Caenis sp</i>	+	99860	<i>Lampsilis radiata luteola</i>	+
18750	<i>Hexagenia limbata</i>	+			
22001	<i>Coenagrionidae</i>	+	No. Quantitative Taxa: 0		Total Taxa: 59
23909	<i>Boyeria vinosa</i>	+	No. Qualitative Taxa: 59		ICI:
34130	<i>Acroneuria frisoni</i>	+	Number of Organisms: 0		Qual EPT: 20
43300	<i>Ranatra sp</i>	+			
47600	<i>Sialis sp</i>	+			
48410	<i>Corydalus cornutus</i>	+			
50315	<i>Chimarra obscura</i>	+			
51400	<i>Nyctiophylax sp</i>	+			
51600	<i>Polycentropus sp</i>	+			
52200	<i>Cheumatopsyche sp</i>	+			
52430	<i>Ceratopsyche morosa group</i>	+			
52530	<i>Hydropsyche depravata group</i>	+			
52570	<i>Hydropsyche simulans</i>	+			
59300	<i>Mystacides sp</i>	+			
59500	<i>Oecetis sp</i>	+			
60300	<i>Dineutus sp</i>	+			
68130	<i>Helichus sp</i>	+			
68601	<i>Ancyronyx variegata</i>	+			
68901	<i>Macronychus glabratus</i>	+			
69400	<i>Stenelmis sp</i>	+			
72700	<i>Anopheles sp</i>	+			
74100	<i>Simulium sp</i>	+			
78401	<i>Natarsia species A (sensu Roback, 1978)</i>	+			
78450	<i>Nilotanypus fimbriatus</i>	+			
80410	<i>Cricotopus (C.) sp</i>	+			
81231	<i>Nanocladius (N.) crassicornus or N. (N.) "rectinervis"</i>	+			
81270	<i>Nanocladius (N.) spiniplenus</i>	+			
81825	<i>Rheocricotopus (Psilocricotopus) robacki</i>	+			

Ohio EPA/DSW Ecological Assessment Section  
Macroinvertebrate Collection

Site: Buffalo Fork  
farm lane off St. Rt. 146

Collection Date: 08/11/2008 River Code: 17-945 RM: 0.80

Taxa Code	Taxa	Quant/Qual	Taxa Code	Taxa	Quant/Qual
03360	<i>Plumatella sp</i>	+	83900	<i>Nilothauma sp</i>	+
03600	<i>Oligochaeta</i>	+	84450	<i>Polypedilum (Uresipedilum) flavum</i>	+
08260	<i>Orconectes (Crockerinus) sanbornii sanbornii</i>	+	84470	<i>Polypedilum (P.) illinoense</i>	+
11001	<i>Baetidae</i>	+	84540	<i>Polypedilum (Tripodura) scalaenum group</i>	+
11130	<i>Baetis intercalaris</i>	+	84601	<i>Saetheria species 1 (sensu Jackson, 1977)</i>	+
11150	<i>Pseudocloeon propinquum</i>	+	84700	<i>Stenochironomus sp</i>	+
11250	<i>Centroptilum sp (w/o hindwing pads)</i>	+	85263	<i>Cladotanytarsus vanderwulpi group Type 3</i>	+
11651	<i>Procloeon sp (w/o hindwing pads)</i>	+	85615	<i>Rheotanytarsus pellucidus</i>	+
11670	<i>Procloeon viridoculare</i>	+	85625	<i>Rheotanytarsus sp</i>	+
13400	<i>Stenacron sp</i>	+	85800	<i>Tanytarsus sp</i>	+
13521	<i>Stenonema femoratum</i>	+	85821	<i>Tanytarsus glabrescens group sp 7</i>	+
13561	<i>Maccaffertium pulchellum</i>	+	85840	<i>Tanytarsus sepp</i>	+
13590	<i>Maccaffertium vicarium</i>	+	95100	<i>Physella sp</i>	+
17200	<i>Caenis sp</i>	+	96900	<i>Ferrissia sp</i>	+
18600	<i>Ephemera sp</i>	+			
23909	<i>Boyeria vinosa</i>	+	No. Quantitative Taxa: 0		Total Taxa: 58
26700	<i>Macromia sp</i>	+	No. Qualitative Taxa: 58		ICI:
34130	<i>Acroneuria frisoni</i>	+	Number of Organisms: 0		Qual EPT: 20
47600	<i>Sialis sp</i>	+			
48410	<i>Corydalus cornutus</i>	+			
50301	<i>Chimarra aterrima</i>	+			
50315	<i>Chimarra obscura</i>	+			
51400	<i>Nyctiophylax sp</i>	+			
52200	<i>Cheumatopsyche sp</i>	+			
52430	<i>Ceratopsyche morosa group</i>	+			
52570	<i>Hydropsyche simulans</i>	+			
59580	<i>Oecetis persimilis</i>	+			
60300	<i>Dineutus sp</i>	+			
60900	<i>Peltodytes sp</i>	+			
68130	<i>Helichus sp</i>	+			
68901	<i>Macronychus glabratus</i>	+			
69400	<i>Stenelmis sp</i>	+			
70000	<i>Diptera</i>	+			
71100	<i>Hexatoma sp</i>	+			
72340	<i>Dixella sp</i>	+			
74100	<i>Simulium sp</i>	+			
77120	<i>Ablabesmyia mallochi</i>	+			
77750	<i>Hayesomyia senata or Thienemannimyia norena</i>	+			
78450	<i>Nilotanypus fimbriatus</i>	+			
81240	<i>Nanocladius (N.) distinctus</i>	+			
81825	<i>Rheocricotopus (Psilocricotopus) robacki</i>	+			
82730	<i>Chironomus (C.) decorus group</i>	+			
82820	<i>Cryptochironomus sp</i>	+			
83040	<i>Dicrotendipes neomodestus</i>	+			

Ohio EPA/DSW Ecological Assessment Section  
 Macroinvertebrate Collection

Site: Williams Fork  
 adj. Pine Lake Rd.

Collection Date: 08/04/2008 River Code: 17-946 RM: 0.20

Taxa Code	Taxa	Quant/Qual	Taxa Code	Taxa	Quant/Qual
03301	<i>Plumatellidae</i>	+	85625	<i>Rheotanytarsus sp</i>	+
03600	<i>Oligochaeta</i>	+	95100	<i>Physella sp</i>	+
04685	<i>Placobdella ornata</i>	+			
08260	<i>Orconectes (Crockerinus) sanbornii sanbornii</i>	+	No. Quantitative Taxa: 0		Total Taxa: 46
11120	<i>Baetis flavistriga</i>	+	No. Qualitative Taxa: 46		ICI:
11130	<i>Baetis intercalaris</i>	+	Number of Organisms: 0		Qual EPT: 18
11200	<i>Callibaetis sp</i>	+			
11250	<i>Centroptilum sp (w/o hindwing pads)</i>	+			
11651	<i>Procloeon sp (w/o hindwing pads)</i>	+			
12200	<i>Isonychia sp</i>	+			
13400	<i>Stenacron sp</i>	+			
13521	<i>Stenonema femoratum</i>	+			
13590	<i>Maccaffertium vicarium</i>	+			
17200	<i>Caenis sp</i>	+			
18600	<i>Ephemera sp</i>	+			
21200	<i>Calopteryx sp</i>	+			
22001	<i>Coenagrionidae</i>	+			
22300	<i>Argia sp</i>	+			
23909	<i>Boyeria vinosa</i>	+			
33100	<i>Leuctra sp</i>	+			
34130	<i>Acroneuria frisoni</i>	+			
50315	<i>Chimarra obscura</i>	+			
51600	<i>Polycentropus sp</i>	+			
52200	<i>Cheumatopsyche sp</i>	+			
52430	<i>Ceratopsyche morosa group</i>	+			
52530	<i>Hydropsyche depravata group</i>	+			
60900	<i>Peltodytes sp</i>	+			
68130	<i>Helichus sp</i>	+			
68708	<i>Dubiraphia vittata group</i>	+			
68901	<i>Macronychus glabratus</i>	+			
69400	<i>Stenelmis sp</i>	+			
72700	<i>Anopheles sp</i>	+			
74100	<i>Simulium sp</i>	+			
78140	<i>Labrundinia pilosella</i>	+			
82820	<i>Cryptochironomus sp</i>	+			
83040	<i>Dicrotendipes neomodestus</i>	+			
83840	<i>Microtendipes pedellus group</i>	+			
84210	<i>Paratendipes albimanus or P. duplicatus</i>	+			
84300	<i>Phaenopsectra obediens group</i>	+			
84450	<i>Polypedilum (Uresipedilum) flavum</i>	+			
84470	<i>Polypedilum (P.) illinoense</i>	+			
84750	<i>Stictochironomus sp</i>	+			
85230	<i>Cladotanytarsus mancus group</i>	+			
85500	<i>Paratanytarsus sp</i>	+			

Ohio EPA/DSW Ecological Assessment Section  
 Macroinvertebrate Collection

Site: White Eyes Creek  
 Okey Rd.

Collection Date: 08/05/2008 River Code: 17-948 RM: 1.60

Taxa Code	Taxa	Quant/Qual	Taxa Code	Taxa	Quant/Qual
03600	<i>Oligochaeta</i>	+	84300	<i>Phaenopsectra obediens group</i>	+
08260	<i>Orconectes (Crockerinus) sanbornii sanbornii</i>	+	84612	<i>Saetheria tylus</i>	+
08601	<i>Hydrachnidia</i>	+	84750	<i>Stictochironomus sp</i>	+
11120	<i>Baetis flavistriga</i>	+	85625	<i>Rheotanytarsus sp</i>	+
11130	<i>Baetis intercalaris</i>	+	87540	<i>Hemerodromia sp</i>	+
11651	<i>Procloeon sp (w/o hindwing pads)</i>	+	95100	<i>Physella sp</i>	+
12200	<i>Isonychia sp</i>	+			
13400	<i>Stenacron sp</i>	+	No. Quantitative Taxa: 0		Total Taxa: 50
13521	<i>Stenonema femoratum</i>	+	No. Qualitative Taxa: 50		ICI:
13590	<i>Maccaffertium vicarium</i>	+	Number of Organisms: 0		Qual EPT: 16
17200	<i>Caenis sp</i>	+			
23804	<i>Basiaeschna janata</i>	+			
23909	<i>Boyeria vinosa</i>	+			
24900	<i>Gomphus sp</i>	+			
34130	<i>Acroneuria frisoni</i>	+			
45900	<i>Notonecta sp</i>	+			
47600	<i>Sialis sp</i>	+			
48410	<i>Corydalus cornutus</i>	+			
50301	<i>Chimarra aterrima</i>	+			
50315	<i>Chimarra obscura</i>	+			
51600	<i>Polycentropus sp</i>	+			
52200	<i>Cheumatopsyche sp</i>	+			
52430	<i>Ceratopsyche morosa group</i>	+			
52530	<i>Hydropsyche depravata group</i>	+			
57900	<i>Pycnopsyche sp</i>	+			
60300	<i>Dineutus sp</i>	+			
60400	<i>Gyrinus sp</i>	+			
63300	<i>Hydroporini</i>	+			
67700	<i>Paracymus sp</i>	+			
68130	<i>Helichus sp</i>	+			
68601	<i>Ancyronyx variegata</i>	+			
68708	<i>Dubiraphia vittata group</i>	+			
69225	<i>Optioservus fastiditus</i>	+			
69400	<i>Stenelmis sp</i>	+			
72340	<i>Dixella sp</i>	+			
77500	<i>Conchapelopia sp</i>	+			
77800	<i>Helopelopia sp</i>	+			
80204	<i>Brillia flavifrons group</i>	+			
81650	<i>Parametriocnemus sp</i>	+			
81825	<i>Rheocricotopus (Psilocricotopus) robacki</i>	+			
82730	<i>Chironomus (C.) decorus group</i>	+			
83820	<i>Microtendipes "caelum" (sensu Simpson &amp; Bode, 1980)</i>	+			
84155	<i>Paralauterborniella nigrohalteralis</i>	+			
84210	<i>Paratendipes albimanus or P. duplicatus</i>	+			

**Ohio EPA/DSW Ecological Assessment Section  
Macroinvertebrate Collection**

Site: Pleasant Run  
Clay Pike

Collection Date: 07/31/2008 River Code: 17-949 RM: 0.10

Taxa Code	Taxa	Quant/Qual	Taxa Code	Taxa	Quant/Qual
01801	<i>Turbellaria</i>	+	96002	<i>Helisoma anceps anceps</i>	+
03360	<i>Plumatella sp</i>	+			
04685	<i>Placobdella ornata</i>	+	No. Quantitative Taxa: 0		Total Taxa: 45
06201	<i>Hyalella azteca</i>	+	No. Qualitative Taxa: 45		ICI:
08260	<i>Orconectes (Crockerinus) sanbornii sanbornii</i>	+	Number of Organisms: 0		Qual EPT: 17
11001	<i>Baetidae</i>	+			
11120	<i>Baetis flavistriga</i>	+			
11130	<i>Baetis intercalaris</i>	+			
12200	<i>Isonychia sp</i>	+			
13400	<i>Stenacron sp</i>	+			
13521	<i>Stenonema femoratum</i>	+			
13590	<i>Maccaffertium vicarium</i>	+			
17200	<i>Caenis sp</i>	+			
21200	<i>Calopteryx sp</i>	+			
23600	<i>Aeshna sp</i>	+			
33100	<i>Leuctra sp</i>	+			
34130	<i>Acroneuria frisoni</i>	+			
34300	<i>Neoperla clymene complex</i>	+			
47600	<i>Sialis sp</i>	+			
51600	<i>Polycentropus sp</i>	+			
52200	<i>Cheumatopsyche sp</i>	+			
52430	<i>Ceratopsyche morosa group</i>	+			
52530	<i>Hydropsyche depravata group</i>	+			
53800	<i>Hydroptila sp</i>	+			
59730	<i>Triaenodes melaca</i>	+			
60900	<i>Peltodytes sp</i>	+			
63300	<i>Hydroporini</i>	+			
66500	<i>Enochrus sp</i>	+			
67500	<i>Laccobius sp</i>	+			
68130	<i>Helichus sp</i>	+			
68708	<i>Dubiraphia vittata group</i>	+			
69225	<i>Optioservus fastiditus</i>	+			
69400	<i>Stenelmis sp</i>	+			
72700	<i>Anopheles sp</i>	+			
74100	<i>Simulium sp</i>	+			
74501	<i>Ceratopogonidae</i>	+			
77500	<i>Conchapelopia sp</i>	+			
81690	<i>Paratrichocladius sp</i>	+			
81825	<i>Rheocricotopus (Psilocricotopus) robacki</i>	+			
82200	<i>Tvetenia bavarica group</i>	+			
82820	<i>Cryptochironomus sp</i>	+			
83040	<i>Dicrotendipes neomodestus</i>	+			
84750	<i>Stictochironomus sp</i>	+			
85625	<i>Rheotanytarsus sp</i>	+			

Ohio EPA/DSW Ecological Assessment Section  
 Macroinvertebrate Collection

Site: Little Salt Creek  
 Sanora Rd.

Collection Date: 08/05/2008 River Code: 17-950 RM: 5.10

Taxa Code	Taxa	Quant/Qual	Taxa Code	Taxa	Quant/Qual
01801	<i>Turbellaria</i>	+	74100	<i>Simulium sp</i>	+
03040	<i>Fredericella sp</i>	+	77120	<i>Ablabesmyia mallochi</i>	+
08250	<i>Orconectes (Procericambarus) rusticus</i>	+	77500	<i>Conchapelopia sp</i>	+
08255	<i>Orconectes rusticus x sanbornii</i>	+	77750	<i>Hayesomyia senata or Thienemannimyia norena</i>	+
08260	<i>Orconectes (Crockerinus) sanbornii sanbornii</i>	+	78401	<i>Natarsia species A (sensu Roback, 1978)</i>	+
08601	<i>Hydrachnidia</i>	+	81690	<i>Paratrichocladius sp</i>	+
11018	<i>Acerpenna macdunnoughi</i>	+	81825	<i>Rheocricotopus (Psilocricotopus) robacki</i>	+
11120	<i>Baetis flavistriga</i>	+	82820	<i>Cryptochironomus sp</i>	+
11125	<i>Pseudocloeon frondale</i>	+	83820	<i>Microtendipes "caelum" (sensu Simpson &amp; Bode, 1980)</i>	+
11130	<i>Baetis intercalaris</i>	+	83840	<i>Microtendipes pedellus group</i>	+
11250	<i>Centroptilum sp (w/o hindwing pads)</i>	+	84210	<i>Paratendipes albimanus or P. duplicatus</i>	+
11651	<i>Procloeon sp (w/o hindwing pads)</i>	+	84440	<i>Polypedilum (Uresipedilum) aviceps</i>	+
12200	<i>Isonychia sp</i>	+	84450	<i>Polypedilum (Uresipedilum) flavum</i>	+
13400	<i>Stenacron sp</i>	+	84470	<i>Polypedilum (P.) illinoense</i>	+
17200	<i>Caenis sp</i>	+	85615	<i>Rheotanytarsus pellucidus</i>	+
21200	<i>Calopteryx sp</i>	+	85625	<i>Rheotanytarsus sp</i>	+
21300	<i>Hetaerina sp</i>	+	86100	<i>Chrysops sp</i>	+
22001	<i>Coenagrionidae</i>	+	86401	<i>Atherix lantha</i>	+
23909	<i>Boyeria vinosa</i>	+	87510	<i>Neoplasta sp</i>	+
45300	<i>Sigara sp</i>	+	87540	<i>Hemerodromia sp</i>	+
47600	<i>Sialis sp</i>	+	95100	<i>Physella sp</i>	+
51600	<i>Polycentropus sp</i>	+	96900	<i>Ferrissia sp</i>	+
52200	<i>Cheumatopsyche sp</i>	+	97601	<i>Corbicula fluminea</i>	+
52430	<i>Ceratopsyche morosa group</i>	+	99240	<i>Lasmigona complanata</i>	+
52530	<i>Hydropsyche depravata group</i>	+	99860	<i>Lampsilis radiata luteola</i>	+
53800	<i>Hydroptila sp</i>	+			
57900	<i>Pycnopsyche sp</i>	+			
59001	<i>Leptoceridae</i>	+			
60300	<i>Dineutus sp</i>	+	No. Quantitative Taxa: 0		Total Taxa: 69
60900	<i>Peltodytes sp</i>	+	No. Qualitative Taxa: 69		ICI:
63300	<i>Hydroporini</i>	+	Number of Organisms: 0		Qual EPT: 16
66500	<i>Enochrus sp</i>	+			
67500	<i>Laccobius sp</i>	+			
67700	<i>Paracymus sp</i>	+			
68130	<i>Helichus sp</i>	+			
68201	<i>Scirtidae</i>	+			
68707	<i>Dubiraphia quadrinotata</i>	+			
68708	<i>Dubiraphia vittata group</i>	+			
68901	<i>Macronychus glabratus</i>	+			
69400	<i>Stenelmis sp</i>	+			
70600	<i>Antocha sp</i>	+			
71100	<i>Hexatoma sp</i>	+			
71900	<i>Tipula sp</i>	+			
72700	<i>Anopheles sp</i>	+			

**Ohio EPA/DSW Ecological Assessment Section  
Macroinvertebrate Collection**

Site: Little Salt Creek  
Clay Pike

Collection Date: 08/05/2008 River Code: 17-950 RM: 0.10

Taxa Code	Taxa	Quant/Qual	Taxa Code	Taxa	Quant/Qual
08260	<i>Orconectes (Crockerinus) sanbornii sanbornii</i>	+	85821	<i>Tanytarsus glabrescens group sp 7</i>	+
08601	<i>Hydrachnidia</i>	+	86401	<i>Atherix lantha</i>	+
11130	<i>Baetis intercalaris</i>	+	87515	<i>Clinocera (C.) sp</i>	+
11150	<i>Pseudocloeon propinquum</i>	+	87540	<i>Hemerodromia sp</i>	+
11250	<i>Centroptilum sp (w/o hindwing pads)</i>	+	96900	<i>Ferrissia sp</i>	+
11670	<i>Procloeon viridoculare</i>	+	97601	<i>Corbicula fluminea</i>	+
12200	<i>Isonychia sp</i>	+			
13400	<i>Stenacron sp</i>	+	No. Quantitative Taxa: 0		Total Taxa: 50
13590	<i>Maccaffertium vicarium</i>	+	No. Qualitative Taxa: 50		ICI:
17200	<i>Caenis sp</i>	+	Number of Organisms: 0		Qual EPT: 15
21200	<i>Calopteryx sp</i>	+			
23909	<i>Boyeria vinosa</i>	+			
24900	<i>Gomphus sp</i>	+			
33100	<i>Leuctra sp</i>	+			
45100	<i>Palmacorixa sp</i>	+			
51600	<i>Polycentropus sp</i>	+			
52200	<i>Cheumatopsyche sp</i>	+			
52430	<i>Ceratopsyche morosa group</i>	+			
53800	<i>Hydroptila sp</i>	+			
57900	<i>Pycnopsyche sp</i>	+			
59720	<i>Triaenodes ignitus</i>	+			
60300	<i>Dineutus sp</i>	+			
60400	<i>Gyrinus sp</i>	+			
63300	<i>Hydroporini</i>	+			
68130	<i>Helichus sp</i>	+			
68601	<i>Ancyronyx variegata</i>	+			
68708	<i>Dubiraphia vittata group</i>	+			
68901	<i>Macronychus glabratus</i>	+			
69400	<i>Stenelmis sp</i>	+			
71900	<i>Tipula sp</i>	+			
72700	<i>Anopheles sp</i>	+			
77120	<i>Ablabesmyia mallochi</i>	+			
77500	<i>Conchapelopia sp</i>	+			
78350	<i>Meropelopia sp</i>	+			
80420	<i>Cricotopus (C.) bicinctus</i>	+			
81825	<i>Rheocricotopus (Psilocricotopus) robacki</i>	+			
82300	<i>Xylotopus par</i>	+			
84155	<i>Paralauterborniella nigrohalteralis</i>	+			
84210	<i>Paratendipes albimanus or P. duplicatus</i>	+			
84470	<i>Polypedilum (P.) illinoense</i>	+			
84700	<i>Stenochironomus sp</i>	+			
85615	<i>Rheotanytarsus pellucidus</i>	+			
85625	<i>Rheotanytarsus sp</i>	+			
85800	<i>Tanytarsus sp</i>	+			



Ohio EPA/DSW Ecological Assessment Section  
 Macroinvertebrate Collection

Site: Frog Run  
 near mouth

Collection Date: 08/05/2008 River Code: 17-951 RM: 0.10

Taxa Code	Taxa	Quant/Qual	Taxa Code	Taxa	Quant/Qual
03600	<i>Oligochaeta</i>	+	82820	<i>Cryptochironomus sp</i>	+
08260	<i>Orconectes (Crockerinus) sanbornii sanbornii</i>	+	83820	<i>Microtendipes "caelum" (sensu Simpson &amp; Bode, 1980)</i>	+
11130	<i>Baetis intercalaris</i>	+	83840	<i>Microtendipes pedellus group</i>	+
11150	<i>Pseudocloeon propinquum</i>	+	84210	<i>Paratendipes albimanus or P. duplicatus</i>	+
11650	<i>Procloeon sp (w/ hindwing pads)</i>	+	84300	<i>Phaenopsectra obediens group</i>	+
12200	<i>Isonychia sp</i>	+	84450	<i>Polypedilum (Uresipedilum) flavum</i>	+
13400	<i>Stenacron sp</i>	+	84470	<i>Polypedilum (P.) illinoense</i>	+
13590	<i>Maccaffertium vicarium</i>	+	84540	<i>Polypedilum (Tripodura) scalaenum group</i>	+
17200	<i>Caenis sp</i>	+	84700	<i>Stenochironomus sp</i>	+
21300	<i>Hetaerina sp</i>	+	84750	<i>Stictochironomus sp</i>	+
23909	<i>Boyeria vinosa</i>	+	85261	<i>Cladotanytarsus vanderwulpi group Type 1</i>	+
50301	<i>Chimarra aterrima</i>	+	85263	<i>Cladotanytarsus vanderwulpi group Type 3</i>	+
51600	<i>Polycentropus sp</i>	+	85501	<i>Paratanytarsus n.sp 1</i>	+
52200	<i>Cheumatopsyche sp</i>	+	85615	<i>Rheotanytarsus pellucidus</i>	+
52430	<i>Ceratopsyche morosa group</i>	+	85625	<i>Rheotanytarsus sp</i>	+
52530	<i>Hydropsyche depravata group</i>	+	85800	<i>Tanytarsus sp</i>	+
53800	<i>Hydroptila sp</i>	+	85821	<i>Tanytarsus glabrescens group sp 7</i>	+
57900	<i>Pycnopsyche sp</i>	+	87540	<i>Hemerodromia sp</i>	+
60300	<i>Dineutus sp</i>	+	96002	<i>Helisoma anceps anceps</i>	+
60900	<i>Peltodytes sp</i>	+	98600	<i>Sphaerium sp</i>	+
63900	<i>Laccophilus sp</i>	+			
64050	<i>Liodesus sp</i>	+			
66500	<i>Enochrus sp</i>	+	No. Quantitative Taxa: 0		Total Taxa: 64
67800	<i>Tropisternus sp</i>	+	No. Qualitative Taxa: 64		ICI:
68130	<i>Helichus sp</i>	+	Number of Organisms: 0		Qual EPT: 14
68601	<i>Ancyronyx variegata</i>	+			
68708	<i>Dubiraphia vittata group</i>	+			
68901	<i>Macronychus glabratus</i>	+			
69225	<i>Optioservus fastiditus</i>	+			
69400	<i>Stenelmis sp</i>	+			
74100	<i>Simulium sp</i>	+			
77500	<i>Conchapelopia sp</i>	+			
77750	<i>Hayesomyia senata or Thienemannimyia norena</i>	+			
77800	<i>Helopelopia sp</i>	+			
78350	<i>Meropelopia sp</i>	+			
78401	<i>Natarsia species A (sensu Roback, 1978)</i>	+			
80410	<i>Cricotopus (C.) sp</i>	+			
80420	<i>Cricotopus (C.) bicinctus</i>	+			
80430	<i>Cricotopus (C.) tremulus group</i>	+			
80720	<i>Eukiefferiella brevicealcar group</i>	+			
81650	<i>Parametriocnemus sp</i>	+			
81690	<i>Paratrichocladius sp</i>	+			
82141	<i>Thienemanniella xena</i>	+			
82300	<i>Xylotopus par</i>	+			

Ohio EPA/DSW Ecological Assessment Section  
 Macroinvertebrate Collection

Site: Georges Run

Collection Date: 08/05/2008 River Code: 17-952 RM: 1.60

dst. U.S. Rt. 22/U.S. Rt. 40

Taxa Code	Taxa	Quant/Qual	Taxa Code	Taxa	Quant/Qual
03600	<i>Oligochaeta</i>	+	82141	<i>Thienemanniella xena</i>	+
07860	<i>Cambarus (Puncticambarus) robustus</i>	+	83820	<i>Microtendipes "caelum" (sensu Simpson &amp; Bode, 1980)</i>	+
08260	<i>Orconectes (Crockerinus) sanbornii sanbornii</i>	+	84155	<i>Paralauterborniella nigrohalteralis</i>	+
11120	<i>Baetis flavistriga</i>	+	84440	<i>Polypedilum (Uresipedilum) aviceps</i>	+
11130	<i>Baetis intercalaris</i>	+	84450	<i>Polypedilum (Uresipedilum) flavum</i>	+
11250	<i>Centroptilum sp (w/o hindwing pads)</i>	+	84470	<i>Polypedilum (P.) illinoense</i>	+
11651	<i>Procloeon sp (w/o hindwing pads)</i>	+	84540	<i>Polypedilum (Tripodura) scalaenum group</i>	+
11670	<i>Procloeon viridoculare</i>	+	84750	<i>Stictochironomus sp</i>	+
12200	<i>Isonychia sp</i>	+	85261	<i>Cladotanytarsus vanderwulpi group Type 1</i>	+
13400	<i>Stenacron sp</i>	+	85500	<i>Paratanytarsus sp</i>	+
13521	<i>Stenonema femoratum</i>	+	85625	<i>Rheotanytarsus sp</i>	+
13590	<i>Maccaffertium vicarium</i>	+	85840	<i>Tanytarsus sepp</i>	+
14950	<i>Leptophlebia sp or Paraleptophlebia sp</i>	+	87540	<i>Hemerodromia sp</i>	+
17200	<i>Caenis sp</i>	+	96900	<i>Ferrissia sp</i>	+
21200	<i>Calopteryx sp</i>	+			
22001	<i>Coenagrionidae</i>	+	No. Quantitative Taxa: 0		Total Taxa: 58
23909	<i>Boyeria vinosa</i>	+	No. Qualitative Taxa: 58		ICI:
33100	<i>Leuctra sp</i>	+	Number of Organisms: 0		Qual EPT: 20
34130	<i>Acroneuria frisoni</i>	+			
50301	<i>Chimarra aterrima</i>	+			
50315	<i>Chimarra obscura</i>	+			
51600	<i>Polycentropus sp</i>	+			
52200	<i>Cheumatopsyche sp</i>	+			
52430	<i>Ceratopsyche morosa group</i>	+			
52530	<i>Hydropsyche depravata group</i>	+			
53800	<i>Hydroptila sp</i>	+			
63300	<i>Hydroporini</i>	+			
65700	<i>Anacaena sp</i>	+			
67700	<i>Paracymus sp</i>	+			
67800	<i>Tropisternus sp</i>	+			
68130	<i>Helichus sp</i>	+			
68708	<i>Dubiraphia vittata group</i>	+			
69400	<i>Stenelmis sp</i>	+			
70600	<i>Antocha sp</i>	+			
72700	<i>Anopheles sp</i>	+			
74100	<i>Simulium sp</i>	+			
77120	<i>Ablabesmyia mallochi</i>	+			
77750	<i>Hayesomyia senata or Thienemannimyia norena</i>	+			
78140	<i>Labrundinia pilosella</i>	+			
78450	<i>Nilotanytus fimbriatus</i>	+			
80410	<i>Cricotopus (C.) sp</i>	+			
80420	<i>Cricotopus (C.) bicinctus</i>	+			
80430	<i>Cricotopus (C.) tremulus group</i>	+			
81650	<i>Parametriocnemus sp</i>	+			

Appendix Table 12. Invertebrate Community Index (ICI) scores and metrics for sites in the Salt Creek (Muskingum River) study area, 2008-2009

River Mile	Drainage Area (sq mi)	Number of				Percent:					Qual. EPT	Eco-region	ICI	
		Total Taxa	Mayfly Taxa	Caddisfly Taxa	Dipteran Taxa	Mayflies	Caddisflies	Tanytarsini	Other Dipt/NI	Tolerant Organisms				
<b>Salt Creek (17-940)</b>														
Year: 2008														
12.70	43.0	47(6)	8(6)	4(6)	19(4)	20.2(4)	1.2(2)	56.1(6)	20.9(6)	5.8(6)	19(6)	4	52	
5.60	75.7	43(6)	8(4)	6(6)	19(4)	11.8(2)	8.6(4)	2.6(2)	71.2(0)	4.7(6)	15(6)	4	40	
<b>Manns Fork (17-941)</b>														
Year: 2008														
2.40	18.6	38(6)	6(4)	2(4)	23(6)	3.4(2)	0.4(2)	26.5(6)	69.1(0)	10.5(4)	16(6)	4	40	
<b>Boggs Creek (17-943)</b>														
Year: 2008														
1.00	17.8	33(4)	7(6)	1(2)	18(4)	14.5(4)	0.1(2)	47.1(6)	37.7(4)	7.7(6)	15(6)	4	44	

## APPENDIX 13 METHODS

All chemical, physical, and biological field, EPA laboratory, data processing, and data analysis methods and procedures adhere to those specified in the Manual of Ohio EPA Surveillance Methods and Quality Assurance Practices (Ohio Environmental Protection Agency 2009), Manual of Laboratory Operating Procedures, Volumes I-IV (Ohio EPA 2002), Biological Criteria for the Protection of Aquatic Life, Volumes II-III (Ohio Environmental Protection Agency 1987b, 1989a, 1989b) including the 2008 updates, Qualitative Habitat Evaluation Index (QHEI); Rationale, Methods, and Application (Rankin 1989) for habitat assessment, and Methods for Assessing Habitat in Flowing Waters: Using the Qualitative Habitat Evaluation Index (QHEI) (Ohio Environmental Protection Agency 2006).

### Determining Use Attainment

Use attainment status is a term describing the degree to which environmental indicators are either above or below criteria specified by the Ohio Water Quality Standards (WQS; Ohio Administrative Code 3745-1). Assessing aquatic use attainment status involves a primary reliance on the Ohio EPA biological criteria (OAC 3745-1-07; Table 7-15). These are confined to ambient assessments and apply to rivers and streams outside of mixing zones. Numerical biological criteria are based on multimetric biological indices including the Index of Biotic Integrity (IBI) and modified Index of Well-Being (MIwb), indices measuring the response of the fish community, and the Invertebrate Community Index (ICI), which indicates the response of the macroinvertebrate community. Three attainment status results are possible at each sampling location - full, partial, or non-attainment. Full attainment means that all of the applicable indices meet the biocriteria. Partial attainment means that one or more of the applicable indices fails to meet the biocriteria. Non-attainment means that none of the applicable indices meet the biocriteria or one of the organism groups reflects poor or very poor performance. An aquatic life use attainment table is constructed based on the sampling results and is arranged from upstream to downstream and includes the sampling locations indicated by river mile, the applicable biological indices, the use attainment status (*i.e.*, full, partial, or non), the Qualitative Habitat Evaluation Index (QHEI), and a sampling location description. All biological results were compared to WWH or EWH biocriteria for the Western Allegheny Plateau ecoregion.

### Stream Habitat Evaluation

Physical habitat is evaluated using the Qualitative Habitat Evaluation Index (QHEI) developed by the Ohio EPA for streams and rivers in Ohio (Rankin 1989, 1995; Ohio EPA 2006). Various attributes of the available habitat are scored based on their overall importance to the establishment of viable, diverse aquatic faunas. Evaluations of type and quality of substrate, amount of instream cover, channel morphology, extent of riparian canopy, pool and riffle development and quality, and stream gradient are among the metrics used to evaluate the characteristics of a stream segment, not just the characteristics of a single sampling site. As such, individual sites may have much poorer physical habitat due to a localized disturbance yet still support aquatic communities closely resembling those sampled at adjacent sites with better habitat, provided water quality conditions are similar. QHEI scores from hundreds of segments around the state have indicated that values higher than 60 were generally conducive to the establishment of warmwater faunas while those which scored in excess of 75-80 often typify habitat conditions which have the ability to support exceptional faunas.

### Sediment and Surface Water Assessment

Fine grain sediments were collected in the upper four inches of bottom material at each sediment sampling location using decontaminated stainless steel scoops. Sediment samples were mixed in stainless steel pans, transferred into glass jars with teflon lined lids, placed on ice (to maintain 4°C) in a cooler, and shipped to the Ohio EPA lab. Sediment data are reported on a dry weight basis. Decontamination of sediment sampling equipment followed the procedures outlined in the Ohio EPA sediment sampling guidance manual (Ohio EPA 2001). Sediment evaluations were conducted using guidelines established in MacDonald *et al.* (2000), and *Ohio Sediment Reference Values (SRVs)* (Ohio EPA 2003). Surface water samples were collected 1-22 times from each location from the upper 12 inches of water over 2008 and 2009. Collected water was preserved using appropriate methods, as outlined in the Manual of Ohio EPA Surveillance Methods and Quality Assurance Practices (Ohio EPA 2009). Bacteriological samples were collected four to nine times at each location. Bacteriological samples were collected directly from the stream into sterilized polyethylene containers, cooled to 4°C, and transported to the Ohio EPA laboratory for analysis within 6 hours of sample collection. All samples were analyzed for *E. coli* bacteria using

U.S.EPA approved methods. Surface water samples were evaluated using comparisons to Ohio Water Quality Standards criteria, reference conditions, or published literature.

### **Macroinvertebrate Community Assessment**

Macroinvertebrates were collected from artificial substrates and/ or from the natural habitats at the Captina Creek watershed sites. The artificial substrate collection provided quantitative data and consisted of a composite sample of five modified Hester-Dendy multiple-plate samplers colonized for six weeks. At the time of the artificial substrate collection, a qualitative multihabitat composite sample was also collected. This sampling effort consisted of an inventory of all observed macroinvertebrate taxa from the natural habitats at each site with no attempt to quantify populations other than notations on the predominance of specific taxa or taxa groups within major macrohabitat types (e.g., riffle, run, pool, margin). At some locations, only a qualitative multihabitat sample was collected. Detailed discussion of macroinvertebrate field and laboratory procedures is contained in Biological Criteria for the Protection of Aquatic Life: Volume III, Standardized Biological Field Sampling and Laboratory Methods for Assessing Fish and Macroinvertebrate Communities (Ohio EPA 1989a, 2008b).

### **Fish Community Assessment**

Fish were sampled once or twice at each site using pulsed DC electrofishing wading or headwater methods. Electrofishing sampling distances ranged between 120 and 220 meters. Fish were processed in the field, and included identifying each individual to species, counting, weighing (wading sites only), and recording any external abnormalities. Discussion of the fish community assessment methodology used in this report is contained in Biological Criteria for the Protection of Aquatic Life: Volume III, Standardized Biological Field Sampling and Laboratory Methods for Assessing Fish and Macroinvertebrate Communities (Ohio EPA 1989a, 2008b).

### **Recreation Use Assessment**

Recreation use attainment was determined using newly adopted criteria that became effective on March 15, 2010. The newly adopted criteria (OAC 3745-1-07) resulted in several changes, which are noted below:

- 1) *E. coli* will be the only indicator organism used to evaluate recreation. The use of fecal coliform will be discontinued.
- 2) The recreation season will be May 1 – October 31 instead of ending on October 15.
- 3) Geometric mean content will be computed on a seasonal basis instead of monthly.
- 4) Geometric mean content will be the sole basis of use attainment status when two or more samples are taken.
- 5) Primary Contact Recreation (PCR) will be divided into three separate categories each with specific numerical criteria: Class A – high use paddling streams, Class B – most typical streams and Class C - historically channelized streams that drain less than 3.1 square miles.

### **Field Instrument Calibration**

Field instruments are calibrated using manufacturer recommended procedures along with procedures noted in the Manual of Ohio EPA Surveillance Methods and Quality Assurance Practices (2009) and Biological Criteria for the Protection of Aquatic Life, Volume III (1989b). pH, conductivity, and dissolved oxygen meters were calibrated daily before the start of field work. Laser rangefinders, used to measure sampling distance, were calibrated once at the Groveport Field Facility prior to summer field sampling activities. Fish weighing scales were checked against certified weights once per week during the field season. Calibration of pH, conductivity, dissolved oxygen, fish weighing scales, and laser rangefinders were recorded in logbooks maintained by Ohio EPA, Ecological Assessment Section and Southeast District Office.

### **Causal Associations**

Using the results, conclusions, and recommendations of this report requires an understanding of the methodology used to determine the use attainment status and assigning probable causes and sources of impairment. The identification of impairment in rivers and streams is straightforward - the numerical biological criteria are used to judge aquatic life use attainment and impairment (partial and nonattainment). The rationale for using the biological criteria, within a weight of evidence framework, has been extensively discussed elsewhere (Karr *et al.* 1986; Karr 1991; Ohio EPA 1987a,b; Yoder 1989; Miner and Borton 1991; Yoder 1991; Yoder 1995). Describing the causes and sources associated with observed impairments relies

on an interpretation of multiple lines of evidence including water chemistry data, sediment data, habitat data, effluent data, land use data, and biological results (Yoder and Rankin 1995). Thus the assignment of principal causes and sources of impairment in this report represent the association of impairments (based on response indicators) with stressor and exposure indicators. The reliability of the identification of probable causes and sources is increased where many such prior associations have been identified, or have been experimentally or statistically linked together. The ultimate measure of success in water resource management is the restoration of lost or damaged ecosystem attributes including aquatic community structure and function. While there have been criticisms of misapplying the metaphor of ecosystem "health" compared to human patient "health" (Suter 1993), in this document we are referring to the process for evaluating biological integrity and causes or sources associated with observed impairments, not whether human health and ecosystem health are analogous concepts.

### NOTICE TO USERS

Ohio EPA incorporated biological criteria into the Ohio Water Quality Standards (WQS; Ohio Administrative Code 3745-1) regulations in February 1990 (effective May 1990). These criteria consist of numeric values for the Index of Biotic Integrity (IBI) and Modified Index of Well-Being (MIwb), both of which are based on fish assemblage data, and the Invertebrate Community Index (ICI), which is based on macroinvertebrate assemblage data. Criteria for each index are specified for each of Ohio's five ecoregions (as described by Omernik 1987), and are further organized by organism group, index, site type, and aquatic life use designation. These criteria, along with the existing chemical and whole effluent toxicity evaluation methods and criteria, figure prominently in the monitoring and assessment of Ohio's surface water resources.

The following documents support the use of biological criteria by outlining the rationale for using biological information, the methods by which the biocriteria were derived and calculated, the field methods by which sampling must be conducted, and the process for evaluating results:

- Ohio Environmental Protection Agency. 1987a. Biological criteria for the protection of aquatic life: Volume I. The role of biological data in water quality assessment. Div. Water Qual. Monit. & Assess., Surface Water Section, Columbus, Ohio.
- Ohio Environmental Protection Agency. 1987b. Biological criteria for the protection of aquatic life: Volume II. Users manual for biological field assessment of Ohio surface waters. Div. Water Qual. Monit. & Assess., Surface Water Section, Columbus, Ohio.
- Ohio Environmental Protection Agency. 1989b. Addendum to Biological criteria for the protection of aquatic life: Volume II. Users manual for biological field assessment of Ohio surface waters. Div. Water Qual. Plan. & Assess., Ecol. Assess. Sect., Columbus, Ohio.
- Ohio Environmental Protection Agency. 1989c. Biological criteria for the protection of aquatic life: Volume III. Standardized biological field sampling and laboratory methods for assessing fish and macroinvertebrate communities. Div. Water Quality Plan. & Assess., Ecol. Assess. Sect., Columbus, Ohio.
- Ohio Environmental Protection Agency. 1990. The use of biological criteria in the Ohio EPA surface water monitoring and assessment program. Div. Water Qual. Plan. & Assess., Ecol. Assess. Sect., Columbus, Ohio.
- Ohio Environmental Protection Agency. 2008a. 2008 updates to Biological Criteria for the Protection of Aquatic Life: Volume II and Volume II Addendum. Users manual for biological field assessment of Ohio surface waters. Div. of Surface Water, Ecol. Assess. Sect., Columbus, Ohio.
- Ohio Environmental Protection Agency. 2008b. 2008 updates to Biological Criteria for the Protection of Aquatic Life: Volume III. Standardized biological field sampling and laboratory methods for assessing fish and macroinvertebrate communities. Div. of Surface Water, Ecol. Assess. Sect., Columbus, Ohio.

Ohio Environmental Protection Agency. 2006. Methods for assessing habitat in flowing waters: Using the Qualitative Habitat Evaluation Index (QHEI). Ohio EPA Tech. Bull. EAS/2006-06-1. Div. of Surface Water, Ecol. Assess. Sect., Columbus, Ohio.

Rankin, E.T. 1989. The qualitative habitat evaluation index (QHEI): rationale, methods, and application. Div. Water Qual. Plan. & Assess., Ecol. Assess. Sect., Columbus, Ohio.

In addition to the preceding guidance documents, the following publications by the Ohio EPA should also be consulted as they present supplemental information and analyses used by the Ohio EPA to implement the biological criteria.

DeShon, J.D. 1995. Development and application of the invertebrate community index (ICI), pp. 217- 243. in W.S. Davis and T. Simon (eds.). Biological Assessment and Criteria: Tools for Riskbased Planning and Decision Making. Lewis Publishers, Boca Raton, FL.

Rankin, E. T. 1995. The use of habitat assessments in water resource management programs, pp. 181-208. in W. Davis and T. Simon (eds.). Biological Assessment and Criteria: Tools for Water Resource Planning and Decision Making. Lewis Publishers, Boca Raton, FL.

Yoder, C.O. and E.T. Rankin. 1995. Biological criteria program development and implementation in Ohio, pp. 109-144. in W. Davis and T. Simon (eds.). Biological Assessment and Criteria: Tools for Water Resource Planning and Decision Making. Lewis Publishers, Boca Raton, FL.

Yoder, C.O. and E.T. Rankin. 1995. Biological response signatures and the area of degradation value: new tools for interpreting multimetric data, pp. 263-286. in W. Davis and T. Simon (eds.). Biological Assessment and Criteria: Tools for Water Resource Planning and Decision Making. Lewis Publishers, Boca Raton, FL.

Yoder, C.O. 1995. Policy issues and management applications for biological criteria, pp. 327-344. in W. Davis and T. Simon (eds.). Biological Assessment and Criteria: Tools for Water Resource Planning and Decision Making. Lewis Publishers, Boca Raton, FL.

Yoder, C.O. and E.T. Rankin. 1995. The role of biological criteria in water quality monitoring, assessment, and regulation. Environmental Regulation in Ohio: How to Cope With the Regulatory Jungle. Inst. of Business Law, Santa Monica, CA. 54 pp.

Yoder, C.O. and M.A. Smith. 1999. Using fish assemblages in a State biological assessment and criteria program: essential concepts and considerations, pp. 17-63. in T. Simon (ed.). Assessing the Sustainability and Biological Integrity of Water Resources Using Fish Communities. CRC Press, Boca Raton, FL.

These documents and this report may be obtained by writing to:

Ohio EPA, Division of Surface Water  
Ecological Assessment Section  
4675 Homer Ohio Lane  
Groveport, Ohio 43125  
(614) 836-8786

or

[http://www.epa.ohio.gov/dsw/document\\_index/psdindx.aspx](http://www.epa.ohio.gov/dsw/document_index/psdindx.aspx)

## BACKGROUND

### *What is a Biological and Water Quality Survey?*

A biological and water quality survey, or “biosurvey”, is an interdisciplinary monitoring effort coordinated on a waterbody specific or watershed scale. This effort may involve a relatively simple setting focusing on one or two small streams, one or two principal stressors, and a handful of sampling sites or a much more complex effort including entire drainage basins, multiple and overlapping stressors, and tens of sites. Each year Ohio EPA conducts biosurveys in 4-5 watersheds study areas with an aggregate total of 250-300 sampling sites.

The Ohio EPA employs biological, chemical, and physical monitoring and assessment techniques in biosurveys in order to meet three major objectives: 1) determine the extent to which use designations assigned in the Ohio Water Quality Standards (WQS) are either attained or not attained; 2) determine if use designations assigned to a given water body are appropriate and attainable; and 3) determine if any changes in key ambient biological, chemical, or physical indicators have taken place over time, particularly before and after the implementation of point source pollution controls or best management practices. The data gathered by a biosurvey is processed, evaluated, and synthesized in a biological and water quality report. Each biological and water quality study contains a summary of major findings and recommendations for revisions to WQS, future monitoring needs, or other actions which may be needed to resolve existing impairment of designated uses. While the principal focus of a biosurvey is on the status of aquatic life uses, the status of other uses such as recreation and water supply, as well as human health concerns, are also addressed.

The findings and conclusions of a biological and water quality study may factor into regulatory actions taken by Ohio EPA (e.g., NPDES permits, Director’s Orders, the Ohio Water Quality Standards [OAC 3745-1], Water Quality Permit Support Documents [WQPSDs]), and are eventually incorporated into State Water Quality Management Plans, the Ohio Nonpoint Source Assessment, and the biennial Integrated Water Quality Monitoring and Assessment Report (305[b] and 303[d]).

### *Hierarchy of Indicators*

A carefully conceived ambient monitoring approach, using cost-effective indicators consisting of ecological, chemical, and toxicological measures, can ensure that all relevant pollution sources are judged objectively on the basis of environmental results. Ohio EPA relies on a tiered approach in attempting to link the results of administrative activities with true environmental measures. This integrated approach includes a hierarchical continuum from administrative to true environmental indicators (Figure 1). The six “levels” of indicators include: 1) actions taken by regulatory agencies (permitting, enforcement, grants); 2) responses by the regulated community (treatment works, pollution prevention); 3) changes in discharged quantities (pollutant loadings); 4) changes in ambient conditions (water quality, habitat); 5) changes in uptake and/or



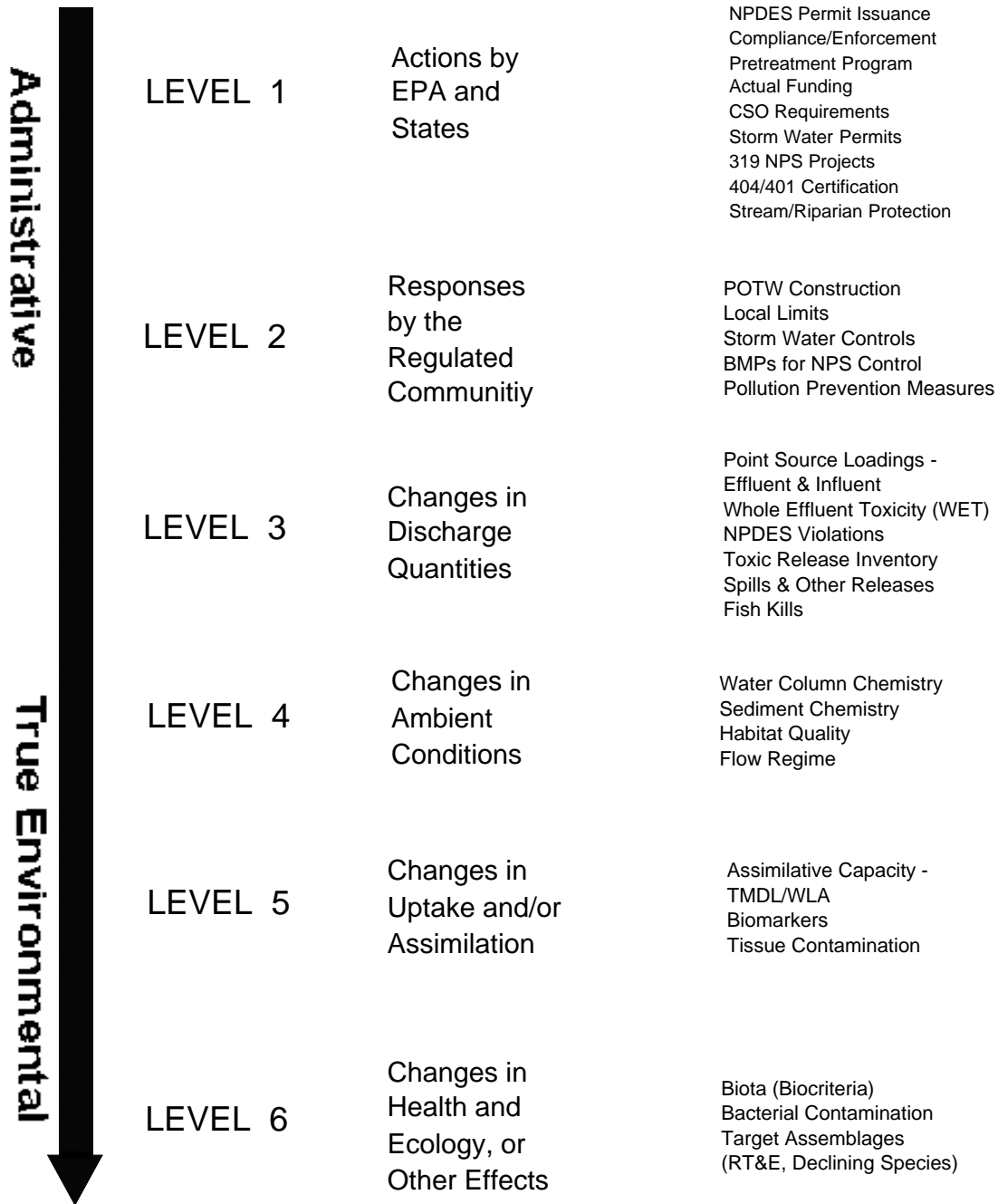


Figure 1. Hierarchy of administrative and environmental indicators which can be used for water quality management activities such as monitoring and assessment, reporting, and the evaluation of overall program effectiveness. This is patterned after a model developed by the U.S. EPA.

assimilation (tissue contamination, biomarkers, wasteload allocation); and, 6) changes in health, ecology, or other effects (ecological condition, pathogens). In this process the results of administrative activities (levels 1 and 2) can be linked to efforts to improve water quality (levels 3, 4, and 5) which should translate into the environmental "results" (level 6). Thus, the aggregate effect of billions of dollars spent on water pollution control since the early 1970s can now be determined with quantifiable measures of environmental condition. Superimposed on this hierarchy is the concept of stressor, exposure, and response indicators. *Stressor* indicators generally include activities which have the potential to degrade the aquatic environment such as pollutant discharges (permitted and unpermitted), land use effects, and habitat modifications. *Exposure* indicators are those which measure the effects of stressors and can include whole effluent toxicity tests, tissue residues, and biomarkers, each of which provides evidence of biological exposure to a stressor or bioaccumulative agent. *Response* indicators are generally composite measures of the cumulative effects of stress and exposure and include the more direct measures of community and population response that are represented here by the biological indices which comprise Ohio's biological criteria. Other response indicators could include target assemblages, *i.e.*, rare, threatened, endangered, special status, and declining species or bacterial levels which serve as surrogates for the recreation uses. These indicators represent the essential technical elements for watershed-based management approaches. The key, however, is to use the different indicators *within* the roles which are most appropriate for each.

Describing the causes and sources associated with observed impairments revealed by the biological criteria and linking this with pollution sources involves an interpretation of multiple lines of evidence including water chemistry data, sediment data, habitat data, effluent data, biomonitoring results, land use data, and biological response signatures within the biological data itself. Thus the assignment of principal causes and sources of impairment represents the association of impairments (defined by response indicators) with stressor and exposure indicators. The principal reporting venue for this process on a watershed or subbasin scale is a biological and water quality report. These reports then provide the foundation for aggregated assessments such as the Integrated Water Quality Monitoring and Assessment Report (305[b] and 303[d]), the Ohio Nonpoint Source Assessment, and other technical bulletins.

#### *Ohio Water Quality Standards: Designated Aquatic Life Use*

The Ohio Water Quality Standards (WQS; Ohio Administrative Code 3745-1) consist of designated uses and chemical, physical, and biological criteria designed to represent measurable properties of the environment that are consistent with the goals specified by each use designation. Use designations consist of two broad groups, aquatic life and non-aquatic life uses. In applications of the Ohio WQS to the management of water resource issues in Ohio's rivers and streams, the aquatic life use criteria frequently result in the most stringent protection and restoration requirements, hence their emphasis in biological and water quality reports. Also, an emphasis on protecting for aquatic life generally results in water quality suitable for all uses. The five different aquatic life uses currently defined in the Ohio WQS are described as follows:

- 1) *Warmwater Habitat (WWH)* - this use designation defines the "typical" warmwater assemblage of aquatic organisms for Ohio rivers and streams; *this use represents the principal restoration target for the majority of water resource management efforts in Ohio.*
- 2) *Exceptional Warmwater Habitat (EWH)* - this use designation is reserved for waters which support "unusual and exceptional" assemblages of aquatic organisms which are characterized by a high diversity of species, particularly those which are highly intolerant and/or rare, threatened, endangered, or special status (*i.e.*, declining species); *this designation represents a protection goal for water resource management efforts dealing with Ohio's best water resources.*
- 3) *Cold-water Habitat (CWH)* - this use is intended for waters which support assemblages of cold water organisms and/or those which are stocked with salmonids with the intent of providing a put-and-take fishery on a year round basis which is further sanctioned by the Ohio DNR, Division of Wildlife; this use should not be confused with the Seasonal Salmonid Habitat (SSH) use which applies to the Lake Erie tributaries which support periodic "runs" of salmonids during the spring, summer, and/or fall.

4) *Modified Warmwater Habitat (MWH)* - this use applies to streams and rivers which have been subjected to extensive, maintained, and essentially permanent hydromodifications such that the biocriteria for the WWH use are not attainable *and where the activities have been sanctioned by state or federal law*; the representative aquatic assemblages are generally composed of species which are tolerant to low dissolved oxygen, silt, nutrient enrichment, and poor quality habitat.

5) *Limited Resource Water (LRW)* - this use applies to small streams (usually <3 mi<sup>2</sup> drainage area) and other water courses which have been irretrievably altered to the extent that no appreciable assemblage of aquatic life can be supported; such waterways generally include small streams in extensively urbanized areas, those which lie in watersheds with extensive drainage modifications, those which completely lack water on a recurring annual basis (*i.e.*, true ephemeral streams), or other irretrievably altered waterways.

Chemical, physical, and/or biological criteria are generally assigned to each use designation in accordance with the broad goals defined by each. As such the system of use designations employed in the Ohio WQS constitutes a "tiered" approach in that varying and graduated levels of protection are provided by each. This hierarchy is especially apparent for parameters such as dissolved oxygen, ammonia-nitrogen, temperature, and the biological criteria. For other parameters such as heavy metals, the technology to construct an equally graduated set of criteria has been lacking, thus the same water quality criteria may apply to two or three different use designations.

#### *Ohio Water Quality Standards: Non-Aquatic Life Uses*

In addition to assessing the appropriateness and status of aquatic life uses, each biological and water quality survey also addresses non-aquatic life uses such as recreation, water supply, and human health concerns as appropriate. The recreation uses most applicable to rivers and streams are the Primary Contact Recreation (PCR) and Secondary Contact Recreation (SCR) uses. The criterion for designating the PCR use can be having a water depth of at least one meter over an area of at least 100 square feet or, lacking this, where frequent human contact is a reasonable expectation. If a water body does not meet either criterion, the SCR use applies. The attainment status of PCR and SCR is determined using bacterial indicators (*e.g.*, fecal coliform, *E. coli*) and the criteria for each are specified in the Ohio WQS.

Attainment of recreation uses are evaluated based on monitored bacteria levels. The Ohio Water Quality Standards state that all waters should be free from any public health nuisance associated with raw or poorly treated sewage (Administrative Code 3745-1-04, Part F). Additional criteria (Administrative Code 3745-1-07) apply to waters that are designated as suitable for full body contact such as swimming (PCR- primary contact recreation) or for partial body contact such as wading (SCR- secondary contact recreation). These standards were developed to protect human health, because even though fecal coliform bacteria are relatively harmless in most cases, their presence indicates that the water has been contaminated with fecal matter.

Water supply uses include Public Water Supply (PWS), Agricultural Water Supply (AWS), and Industrial Water Supply (IWS). Public Water Supplies are simply defined as segments within 500 yards of a potable water supply or food processing industry intake. The AWS and IWS use designations generally apply to all waters unless it can be clearly shown that they are not applicable. An example of this would be an urban area where livestock watering or pasturing does not take place, thus the AWS use would not apply. Chemical criteria are specified in the Ohio WQS for each use and attainment status is based primarily on chemical-specific indicators. Human health concerns are additionally addressed with fish tissue data, but any consumption advisories are issued by the Ohio Department of Health.