APPENDICES A–E

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Appendix E: Kentucky Environmental Services Branch Split Sample Selenium Whole-body Tissue Calculation

APPENDIX A: SAMPLE LOCATION GEOGRAPHIC COORDINATES

Appendix A: Phase I Sample Location Geographic Coordinates
Herrington Lake Phase I Field Sampling Technical Memorandum
Mercer County, Kentucky

Sampling Focus Regions ↓	Sampling Location	Longitude (decimal degrees)	Latitude (decimal degrees)
Curds Inlet (Sorted by distance from The Plant)	CURDSNB	-84.71462	37.78562
	CURDS1	-84.71445	37.78569
	CI-1A	-84.71433	37.78569
	CI-1B	-84.71433	37.78566
	CI-1C	-84.71433	37.78563
	CURDS2A	-84.71391	37.78553
	CURDS2B	-84.71394	37.78548
	CURDS2C	-84.71397	37.78544
	CI-2A	-84.71370	37.78544
	CI-2B	-84.71374	37.78539
	CI-2C	-84.71376	37.78536
	CI-3A	-84.71226	37.78485
	CI-3B	-84.71237	37.78475
	CI-3C	-84.71245	37.78468
	CI-4A	-84.71138	37.78398
	CI-4B	-84.71118	37.78410
	CI-4C	-84.71165	37.78378
HQ Inlet	HQ-1A	-84.71240	37.78261
	HQ-1B	-84.71244	37.78250
	HQ-1C	-84.71248	37.78243
Rocky Run	LHL-1B	-84.69889	37.78059
	LHL-1C	-84.69993	37.77954
Dix Dam	LHL-2B	-84.70643	37.78484
	LHL-2C	-84.70507	37.78223
Dix River	DR1	-84.70772	37.79344
Hardin Inlet	HI-1A	-84.71675	37.77282
	HI-1B	-84.71662	37.77281
	HI-1C	-84.71673	37.77274
Lower Herrington Lake Main Channel	LHL-3B	-84.71208	37.77990
	LHL-3C	-84.70977	37.77934
	LHL-4B	-84.71289	37.77481
	LHL-4C	-84.71059	37.77312
	LHL-5B	-84.72281	37.76313
	LHL-5C	-84.71982	37.76253
	LHL-6B	-84.69286	37.75907
	LHL-6C	-84.69515	37.75930

Middle Herrington Lake Fish Region Centroids	MHL1	-84.71623	37.72514
	MHL3	-84.68459	37.64962

Notes:
Surface Water Transect (lines) can be constructed by connecting the dots using the coordinates from each sample location (e.g. LHL5B to LHL5C forms the LHL5 transect).
For the fish-only locations MHL1 and MHL3, the reported coordinates represent the centroid of the approximately 14 acres fishing regions.
Coordinates are reported in NAD 1983 US Decimal Degrees.

CI Curds Inlet

HI Hardin Inlet

HQ HQ Inlet

LHL Lower Herrington Lake

MHL Middle Herrington Lake

DR Dix River

APPENDIX B: PHOTO LOGS

Appendix B1: Fishing Methods and Field-Catch Photo Log

Appendix B2: Fish Sample Photo Log

Appendix B3: Surface Water Collection Photo Log

Appendix B4: Sediment Pore Water Collection and Preparation Photo Log

Appendix B5: Sediment Sample Photo Log

Appendix B6: Aquatic Vegetation and Invertebrate Sample Photo Log

APPENDIX B: PHOTO LOGS

Appendix B1: Fishing Methods and Field-Catch Photo Log

Photo 1: Pennington and Associates at the Gwinn Island Fish Camp Boat Ramp assembling the electrofishing equipment for use in Middle Herrington Lake.

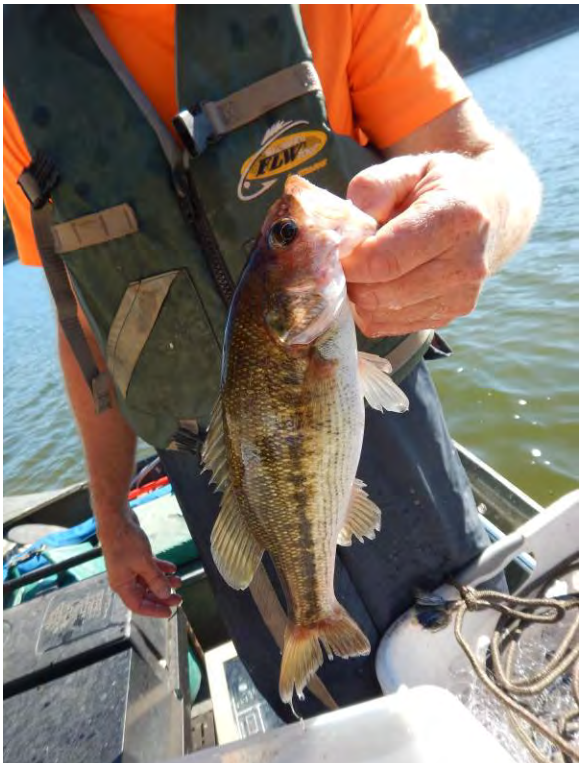


Photo 2: A medium-sized largemouth bass caught using a gill net.

Photo 3: Multiple bluegill netted during electrofishing in Lower Herrington Lake.

Photo 4: Crappie, which was released.

Photo 5: A freshwater drum, which was released.

Photo 6: Multiple largemouth bass caught using gillnets in Lower Herrington Lake.

Photo7: Gizzard shad used as cut-bait for the trotlines.

Photo 8: Baiting a trotline.

Photo 9: Deploying a trotline.

Photo 10: Deploying a trotline.

Photo 11: A medium-sized channel catfish caught using a trotline in Curds Inlet (CI).

Photo 12: A medium-sized channel catfish caught using a trotline.

Photo 13: A large female flathead catfish caught on a trotline at MHL1 (Middle Herrington Lake).

Photo 14: Large channel catfish caught on a trotline at LHL3 (Lower Herrington Lake).

APPENDIX B: PHOTO LOGS

Appendix B2: Fish Sample Photo Log

Photo 1: Bluegill composite sample (1 of 2) from Curds Inlet.
Sample ID = FWB-001(BG)-CI-171004

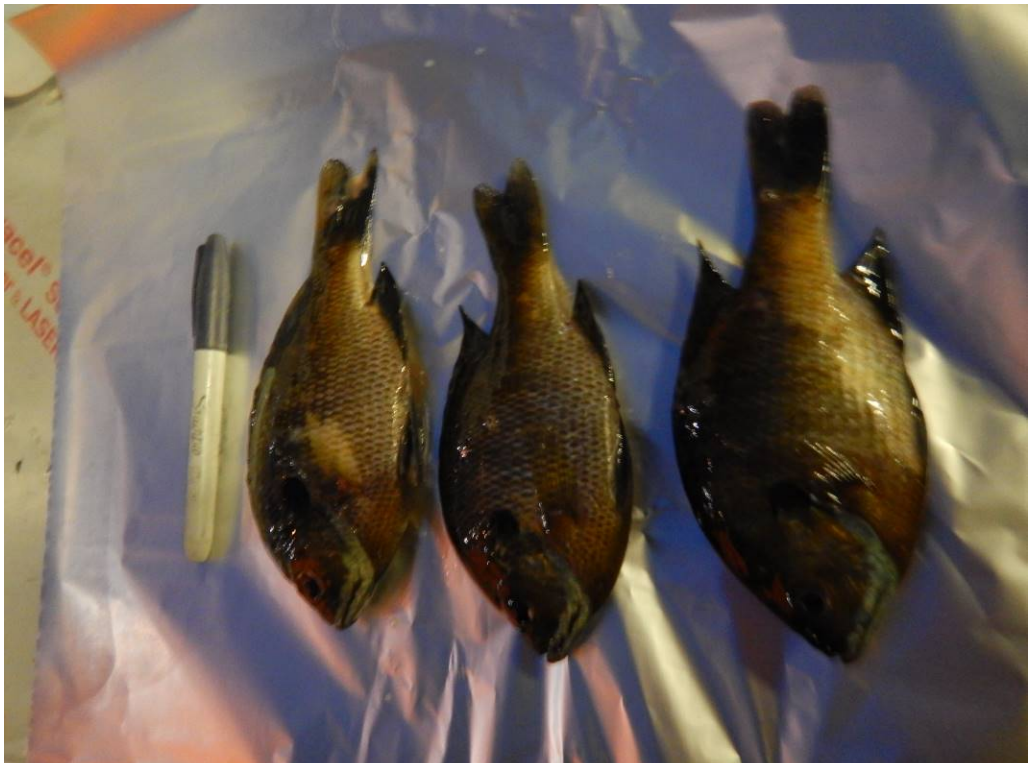


Photo 2: Bluegill composite sample (2 of 2) from Curds Inlet.
Sample ID = FWB-002(BG)-CI-171004

Photo 3: Largemouth bass composite sample (1 of 2) from Curds Inlet.
Sample ID = FWB-001(LMB)-CI-171004

Photo 4: Ovary from largemouth bass composite sample (1 of 2) from Curds Inlet.
Sample ID = FO-001(LMB)-CI-171004

Photo 5: Largemouth bass composite sample (2 of 2) from Curds Inlet.
Sample ID = FWB-002(LMB)-CI-171004

Photo 6: Channel catfish composite sample (1 of 2) from Curds Inlet.
Sample ID = FWB-001(CC)-CI-171013

Photo 7: Flathead catfish composite sample from Curds Inlet.
Sample ID = FWB-001(FHC)-CI-171013

Photo 8: Bluegill composite sample (1 of 2) from HQ Inlet.
Sample ID = FWB-001(BG)-HQ-171004

Photo 9: Bluegill composite sample (2 of 2) from HQ Inlet.
Sample ID = FWB-002(BG)-HQ-171004

Photo 10: Bluegill composite sample (1 of 2) from LHL1 (Lower Herrington Lake).
Sample ID = FWB-001(BG)-LHL1-171011

Photo 11: Bluegill composite sample (2 of 2) from LHL1 (Lower Herrington Lake).
Sample ID = FWB-002(BG)-LHL1-171004

Photo 12: Largemouth bass composite sample (1 of 2) from LHL1 (Lower Herrington Lake).
Sample ID = FWB-001(LMB)-LHL1-171005

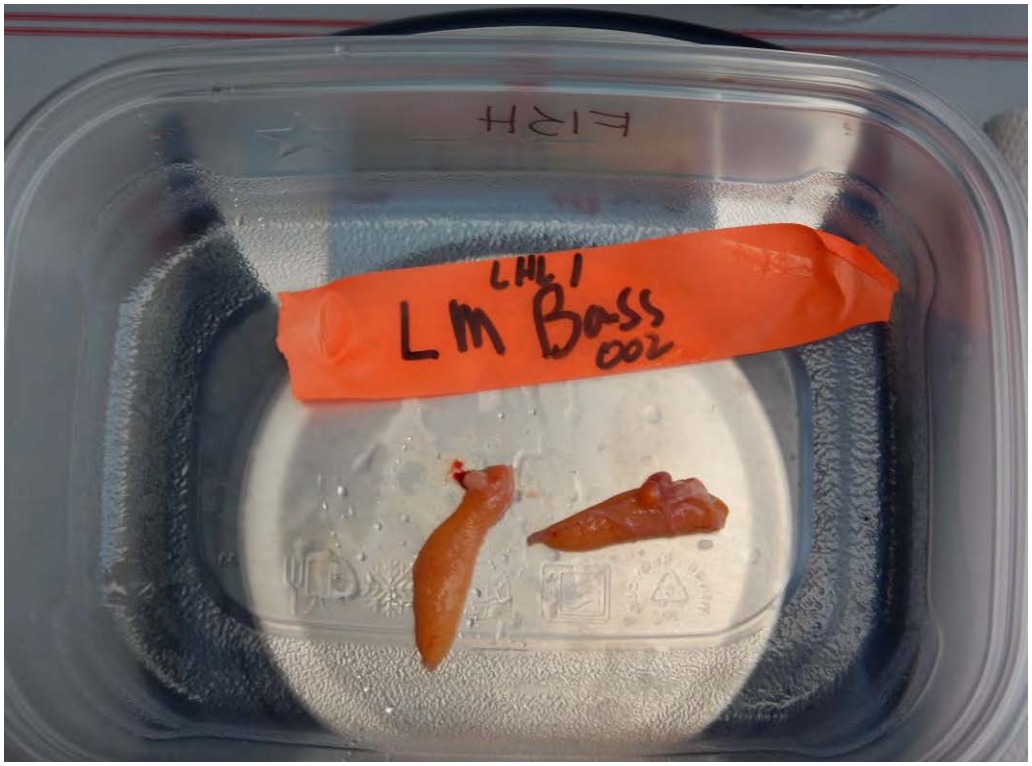


Photo 13: Ovary from largemouth bass composite sample (1 of 2) from LHL1 (Lower Herrington Lake). Sample ID = FO-001(LMB)-LHL1-171005

Photo 14: Largemouth bass composite sample (2 of 2) from LHL1 (Lower Herrington Lake). Sample ID = FWB-002(LMB)-LHL1-171005

Photo 15: Channel catfish sample from LHL1 (Lower Herrington Lake).
Sample ID = FWB-001(CC)-LHL1-171005

Photo 16: Flathead catfish sample from LHL1 (Lower Herrington Lake).
Sample ID = FWB-001(FHC)-LHL1-171005

Photo 17: Bluegill composite samples (2 of 2) from LHL2 (Dix Dam, Lower Herrington Lake). Sample IDs = FWB-001(BG)-LHL2-171005 and FWB-002(BG)-LHL2-171005

Photo 18: Largemouth bass composite samples (1 of 1, left 3 fish only) from LHL2 (Dix Dam). Sample ID = FWB-001(LMB)-LHL2-171005

Photo 19: Ovary from Kentucky bass composite sample from LHL2 (Dix Dam, Lower Herrington Lake). Sample ID = FO-001(KB)-LHL2-171005

Photo 20: Channel catfish sample from LHL2 (Dix Dam, Lower Herrington Lake). Sample ID = FWB-001(CC)-LHL2-171005

Photo 21: Flathead catfish sample from LHL2 (Dix Dam, Lower Herrington Lake).
Sample ID = FWB-001(FHC)-LHL2-171005

Photo 22: Bluegill composite samples (2 of 2) from LHL3 (Lower Herrington Lake).
Sample IDs = FWB-001(BG)-LHL3-171005 and FWB-002(BG)-LHL3-171005

Photo 23: Kentucky bass composite sample (2 of 2) from LHL3 (Lower Herrington Lake). Sample ID = FWB-002(KB)-LHL3-171004

Photo 24: Ovary from Kentucky bass composite sample (2 of 2) from LHL3 (Lower Herrington Lake). Sample ID = FO-002(KB)-LHL3-171004

Photo 25: Channel catfish sample (1 of 2) from LHL3 (Lower Herrington Lake).
Sample ID = FWB-001(CC)-LHL3-171005

Photo 26: Channel catfish sample (1 of 2) from LHL3 (Lower Herrington Lake).
Sample ID = FWB-001(CC)-LHL3-171005

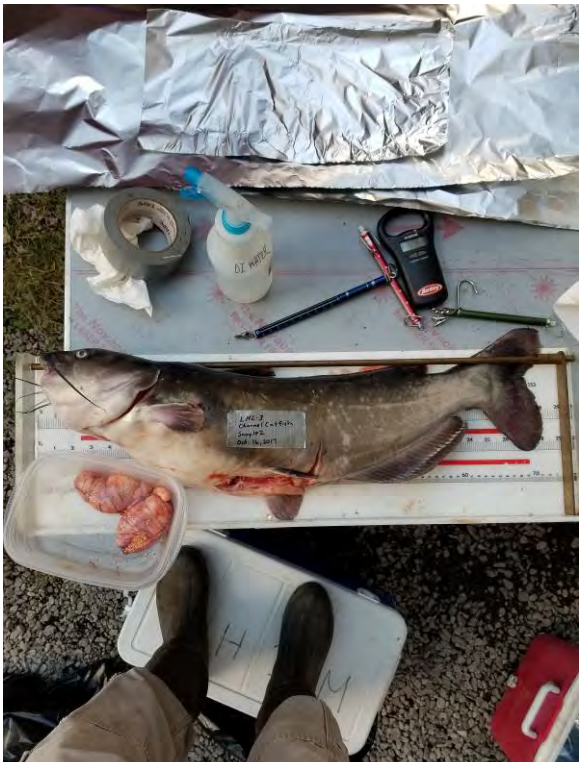


Photo 27: Channel catfish and ovary sample (2 of 2) from LHL3 (Lower Herrington Lake). Sample IDs = FWB-002(CC)-LHL3-171016 and FO-002(CC)-LHL3-171016

Photo 28: Largemouth bass composite sample from LHL4 (Lower Herrington Lake). Sample ID = FWB-001(LMB)-LHL4-171003

Photo 29: Channel catfish sample from LHL4 (Lower Herrington Lake).
Sample ID = FWB-001(CC)-LHL4-171012

Photo 30: Flathead catfish sample from LHL4 (Lower Herrington Lake).
Sample ID = FWB-001(FHC)-LHL4-171012

Photo 31: Bluegill composite sample (partial 1 of 2) from LHL5 (Lower Herrington Lake). Sample ID = FWB-001(BG)-LHL5-171011

Photo 32: Bluegill composite sample (partial 1 of 2) from LHL5 (Lower Herrington Lake). Sample ID = FWB-001(BG)-LHL5-171011

Photo 33: Bluegill composite sample (2 of 2) from LHL5 (Lower Herrington Lake).
Sample ID = FWB-002(BG)-LHL5-171011

Photo 34: Largemouth bass composite sample (1 of 2) from LHL5 (Lower Herrington Lake).
Sample ID = FWB-001(LMB)-LHL5-171007

Photo 35: Ovary from largemouth bass composite sample (1 of 2) from LHL5 (Lower Herrington Lake). Sample ID = FO-001(LMB)-LHL5-171007

Photo 36: Largemouth bass composite sample (2 of 2) from LHL5 (Lower Herrington Lake). Sample ID = FWB-002(LMB)-LHL5-171007

Photo 37: Channel catfish composite sample (1 of 2) from LHL5 (Lower Herrington Lake). Sample ID = FWB-001(CC)-LHL5-171007

Photo 38: Ovary from channel catfish composite sample (1 of 2) from LHL5 (Lower Herrington Lake). Sample ID = FO-001(CC)-LHL5-171007

Photo 39: Channel catfish composite sample (2 of 2) from LHL5 (Lower Herrington Lake). Sample ID = FWB-002(CC)-LHL5-171007

Photo 40: Bluegill composite sample (1 of 2) from LHL6 (Lower Herrington Lake). Sample ID = FWB-001(BG)-LHL6-171011

Photo 41: Bluegill composite sample (2 of 2) from LHL6 (Lower Herrington Lake). Sample ID = FWB-002(BG)-LHL6-171011

Photo 42: Kentucky bass and ovary composite sample (partial composite 1 of 1) from LHL6 (Lower Herrington Lake). Sample ID = FWB-001(KB)-LHL6-171007 and FO-001(KB)-LHL6-171007

Photo 43: Channel catfish and ovary composite sample (partial composite 1 of 2) from LHL6 (Lower Herrington Lake).
Sample ID = FWB-001(CC)-LHL6-171007 and FO-001(CC)-LHL6-171007

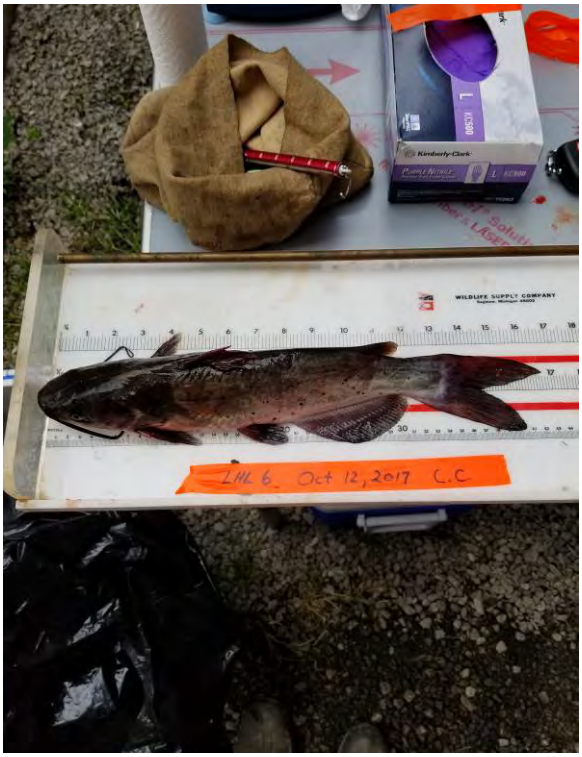


Photo 44: Channel catfish composite sample (partial composite 3 of 2) from LHL6 (Lower Herrington Lake).
Sample ID = FWB-002(CC)-LHL6-17100

Photo 45: Bluegill composite samples (2 samples) from MHL1 (Middle Herrington Lake). Sample IDs = FWB-001(BG)-MHL1-171015 and FWB-002(BG)-MHL1-171015

Photo 46: Largemouth bass composite sample from MHL1 (Middle Herrington Lake). Sample ID = FWB-001(LMB)-MHL1-171015

Photo 47: Kentucky bass composite sample from MHL1 (Middle Herrington Lake).
Sample ID = FWB-001(KB)-MHL1-171014

Photo 48: Flathead catfish composite sample (1 of 2) from MHL1 (Middle Herrington Lake).
Sample ID = FWB-001(FHC)-MHL1-171014

Photo 49: Flathead catfish sample (2 of 2) from MHL1 (Middle Herrington Lake).
Sample ID = FWB-002(FHC)-MHL1-171014

Photo 50: Bluegill composite samples (2 samples) from MHL3 (Middle Herrington Lake).
Sample IDs = FWB-001(BG)-MHL3-171014 and FWB-002(BG)-MHL3-171014

Photo 51: Largemouth bass composite sample (1 of 2) from MHL3 (Middle Herrington Lake). Sample ID = FWB-001(LMB)-MHL3-171014

Photo 52: Largemouth bass composite sample (2 of 2) from MHL3 (Middle Herrington Lake). Sample ID = FWB-002(LMB)-MHL3-171014

Photo 53: Channel catfish composite sample (1 of 2) from MHL3 (Middle Herrington Lake). Sample ID = FWB-001(CC)-MHL3-171014

Photo 54: Channel catfish composite sample (2 of 2) from MHL3 (Middle Herrington Lake). Sample ID = FWB-002(CC)-MHL3-171014

Photo 55: Bluegill composite sample (1 of 1) from Dix River (below Dix Dam).
Sample ID = FWB-001(BG)-DR-171016

Photo 56: Green sunfish composite sample (1 of 2) from Dix River (below Dix Dam).
Sample ID = FWB-001(GS)-DR-171014

Photo 57: Green sunfish composite sample (2 of 2, left 4 fish only) from Dix River (below Dix Dam).
Sample ID = FWB-002(GS)-DR-171016

Photo 58: Largemouth bass sample from Dix River (below Dix Dam).
Sample ID = FWB-001(LMB)-DR-171016

Photo 59: Brown trout sample from Dix River (below Dix Dam).
Sample ID = FWB-001(BT)-DR-171016

Photo 60: Spotted sucker composite sample (top two fish only) from Dix River (below Dix Dam).
Sample ID = FWB-001(SS)-DR-171016

Photo 61: Northern hog sucker composite sample from Dix River (below Dix Dam). Sample ID = FWB-001(HS)-DR-171016

APPENDIX B: PHOTO LOGS

Appendix B3: Surface Water Collection Photo Log

Photo 1: One of the samplers used to collect surface water samples.

Photo 2: Tubing to transfer surface water from the sampler to the sampling containers.

RAMBOLL

Appendix B3

Surface Water Collection Photo Log

Herrington Lake Corrective Action Plan: Phase I Technical Memorandum and Phase II Plan

Mercer County, Kentucky

Photo 3: Transferring surface water to sampling containers.

APPENDIX B: PHOTO LOGS

Appendix B4: Sediment Pore Water Collection and Preparation Photo Log

Photo 1: A new passive diffusion pore water “peeper” ready for deployment on the dive boat.

Photo 2: An orange marker buoy for a peeper, suspended below the water surface, ready for retrieval. It sits in approximately 10ft shallow water depth compared to when it was deployed.

Photo 3: To ensure an anoxic environment, all peepers were contained within its associated native sediment, bagged in-place, and slowly brought to the surface by divers.

Photo 4: Multiple passive diffusion peeper pore water samples, retained in their native sediment prior to pore water extraction.

Photo 5: A retrieved peeper prior to pore water extraction.

Photo 6: Sterile (one-time use) 60ml hypodermic needle and 0.45um filter for extracting filtered pore water from a peeper.

Photo 7: Inert argon gas, unlike helium or nitrogen, is heavier than air and will fill up the bag, used to enclose the peeper for sample transfer, from the bottom first, including the containers.

Photo 8: Mobile laboratory argon-filled bag for transferring pore water into the containers.

Photo 9: Maintaining an anoxic environment while transferring the pore water from the hypodermic needle(s) into the appropriate containers.

riority	Constituent	Method	Container	Preservative	(Absolute) Minimum Volume Required (mls)	Top Off bottle	Hold Times
1	Speciated Selenium	IC-ICP-CRC-MS	60 ml opaque HDPE	None*	50	10	1 Year
2	Arsenic Speciation	1632	125 mL bottles	HCl	100		28 days
3	Metals/Mercury	200.8/7471	50 mL centrifuge tubes	HNO3	50		28 days
4	Methyl Mercury	1630	60 ml Teflon centrifuge tubes	HCl	50		28 days
	Mercury	1631E	30 ml bottles	HCl	25		28 days
	Sulfate	300	15 mL centrifuge tubes	None	10		28 days
	Total Organic Carbon	9060	40 mL H2SO4 vials	H2SO4	25		28 days
				Total Volume	310	320	

Photo 10: Pore water sample containers.

APPENDIX B: PHOTO LOGS

Appendix B5: Sediment Sample Photo Log

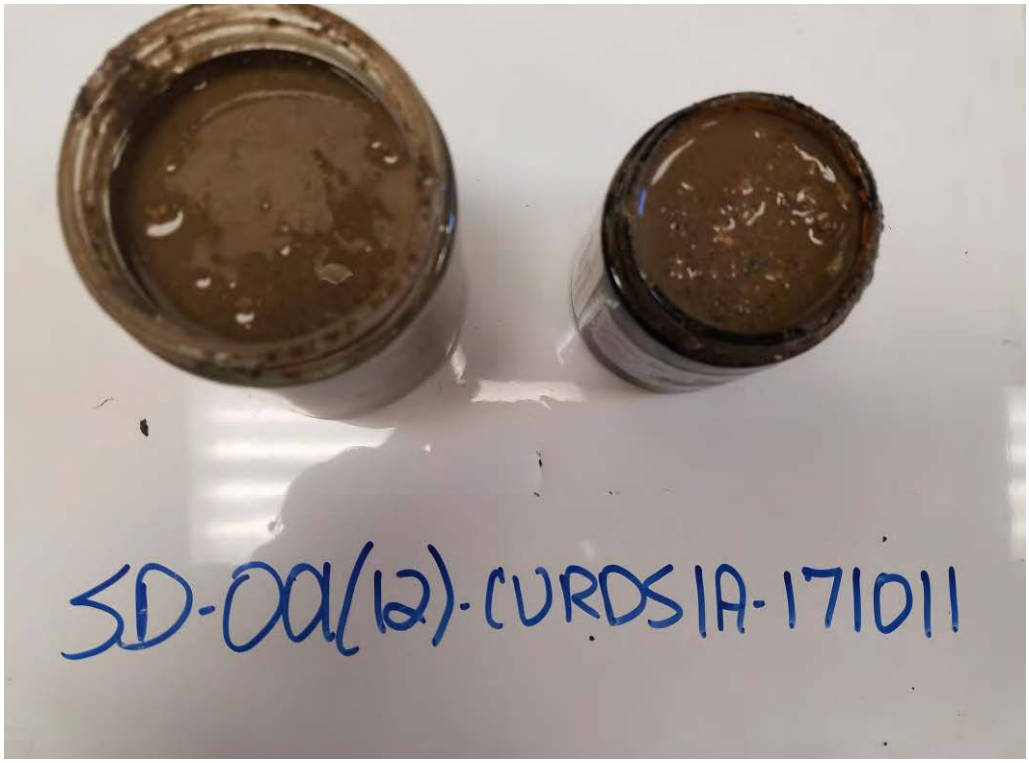


Photo 1: Sediment sample collected from Curds1 (Upper Curds Inlet), Lower Herrington Lake. Sample ID = SD-001(12)-Curds1A-171011

Photo 2: Sediment sample collected from CI1A (Upper Curds Inlet), Lower Herrington Lake. Sample ID = SD-001(16)-CI1A-171011

Photo 3: Sediment sample collected from CI1B (Upper Curds Inlet), Lower Herrington Lake. Sample ID = SD-001(15)-CI1B-171011

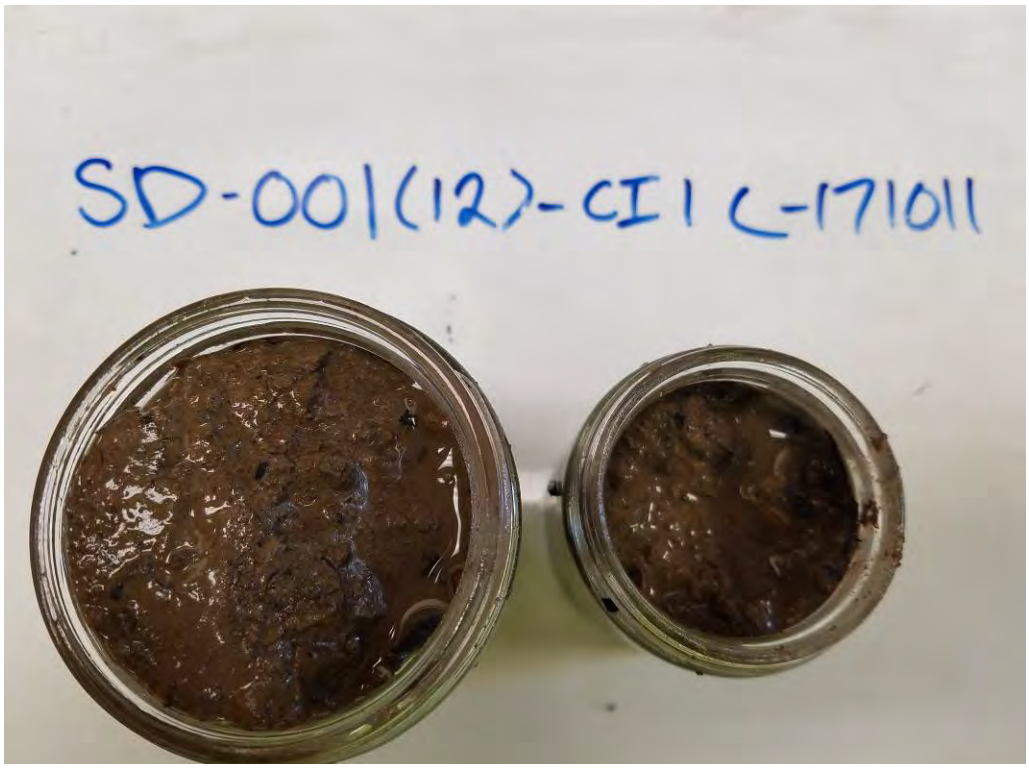


Photo 4: Sediment sample collected from CI1C (Upper Curds Inlet), Lower Herrington Lake. Sample ID = SD-001(12)-CI1C-171011

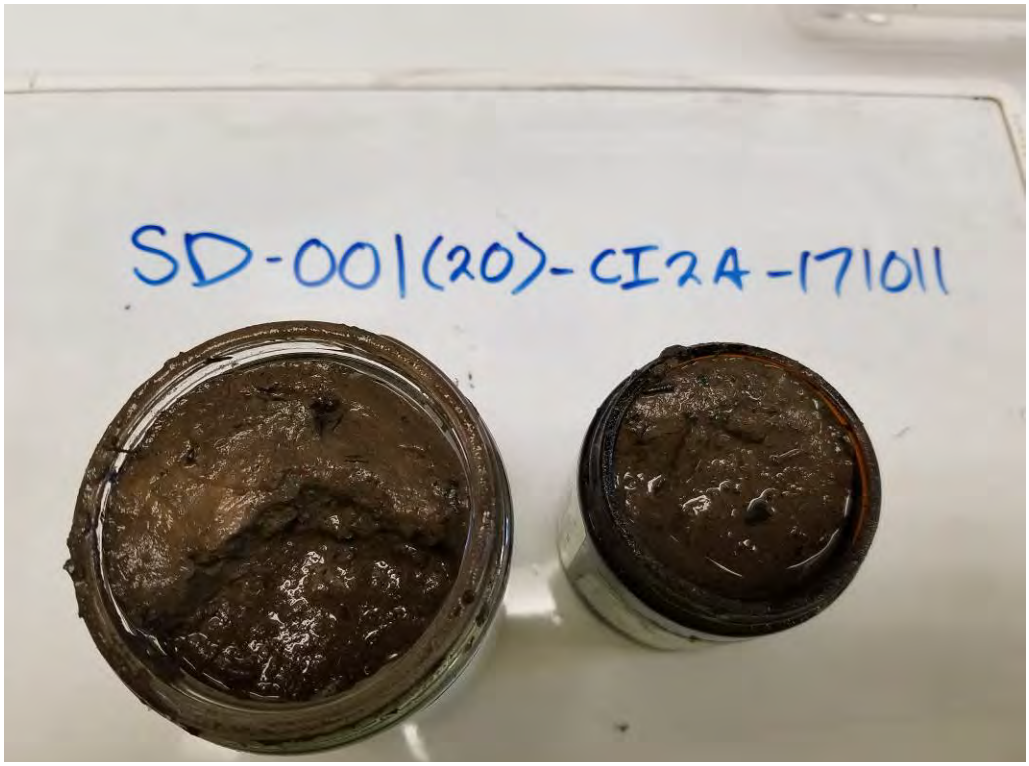


Photo 5: Sediment sample collected from CI2A (Upper Curds Inlet), Lower Herrington Lake. Sample ID = SD-001(20)-CI2A-171011

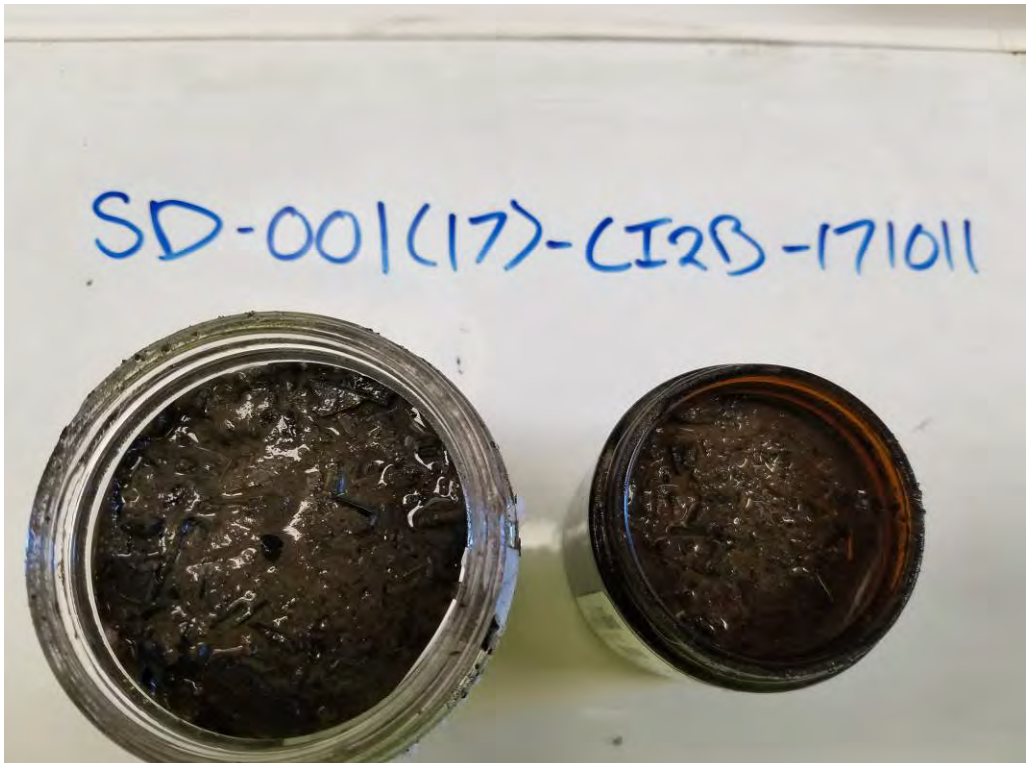


Photo 6: Sediment sample collected from CI2B (Curds Inlet), Lower Herrington Lake. Sample ID = SD-001(17)-CI2B-171011

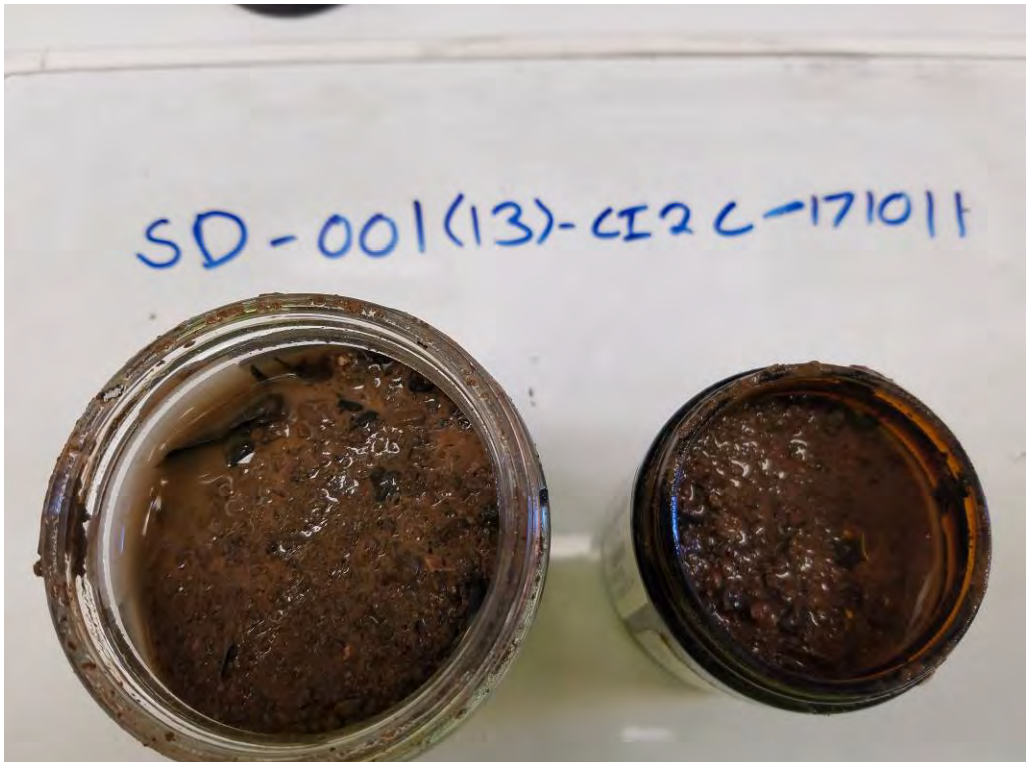


Photo 7: Sediment sample collected from CI2C (Curds Inlet), Lower Herrington Lake. Sample ID = SD-001(13)-CI2C-171011

Photo 8: Sediment sample collected from CI3A (Curds Inlet), Lower Herrington Lake. Sample ID = SD-001(31)-CI3A-171011

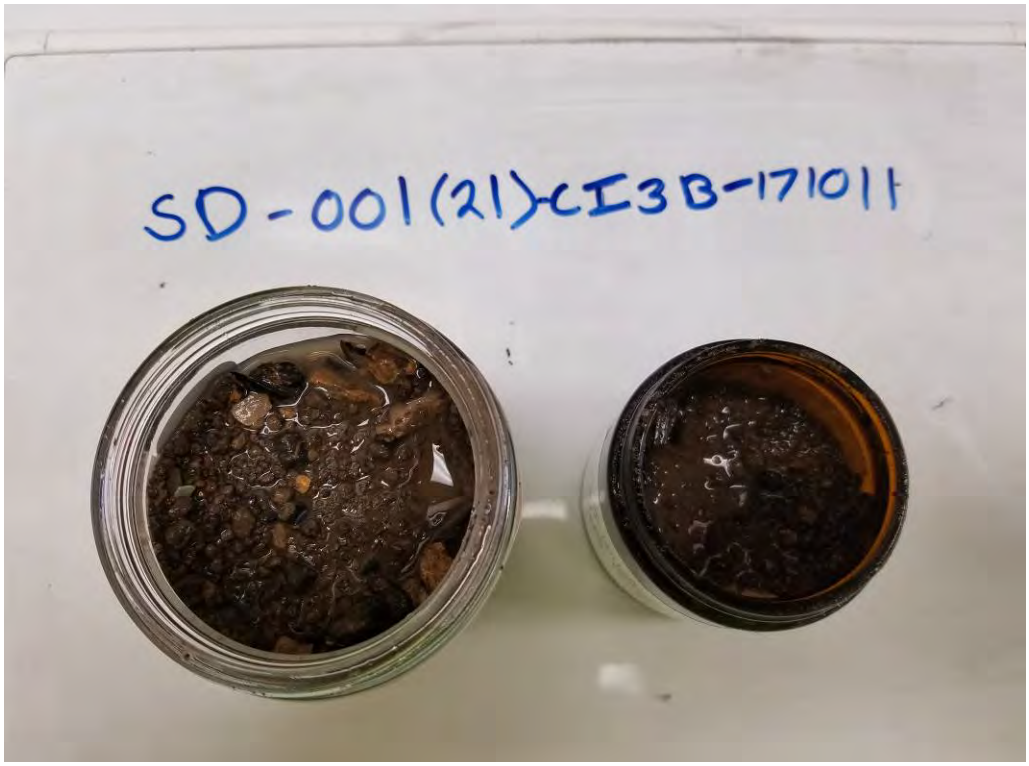


Photo 9: Sediment sample collected from CI3B (Curds Inlet), Lower Herrington Lake.
Sample ID = SD- SD-001(21)-CI3B-171011

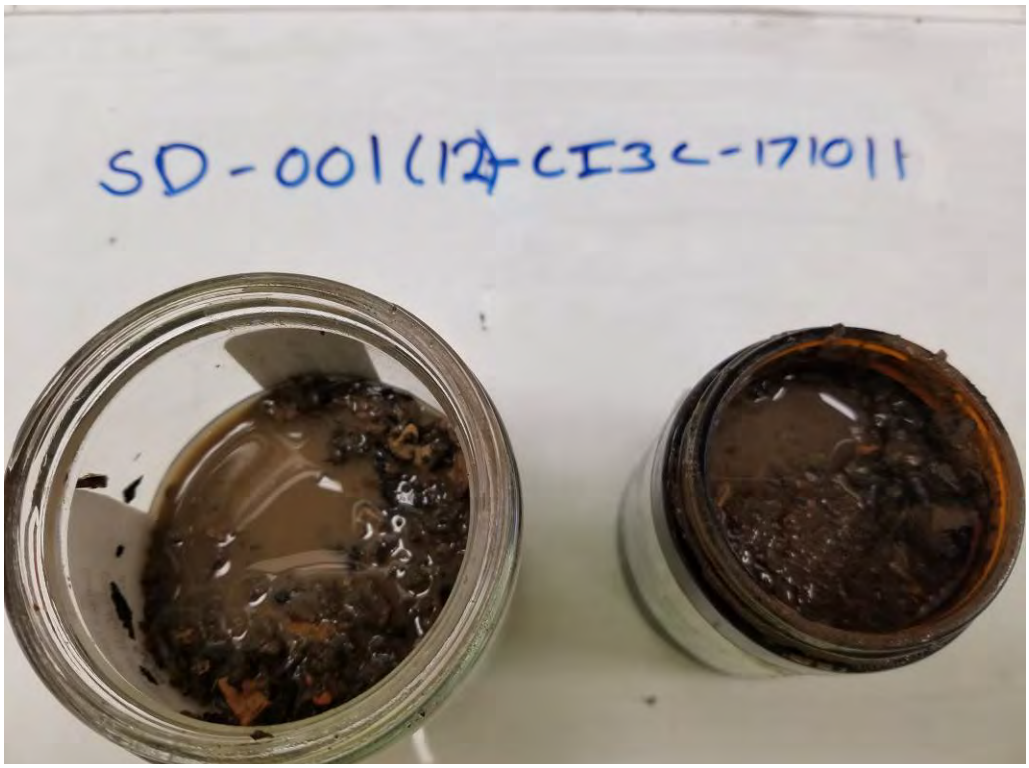


Photo 10: Sediment sample collected from CI3C (Curds Inlet), Lower Herrington Lake.
Sample ID = SD- SD-001(12)-CI3C-171011

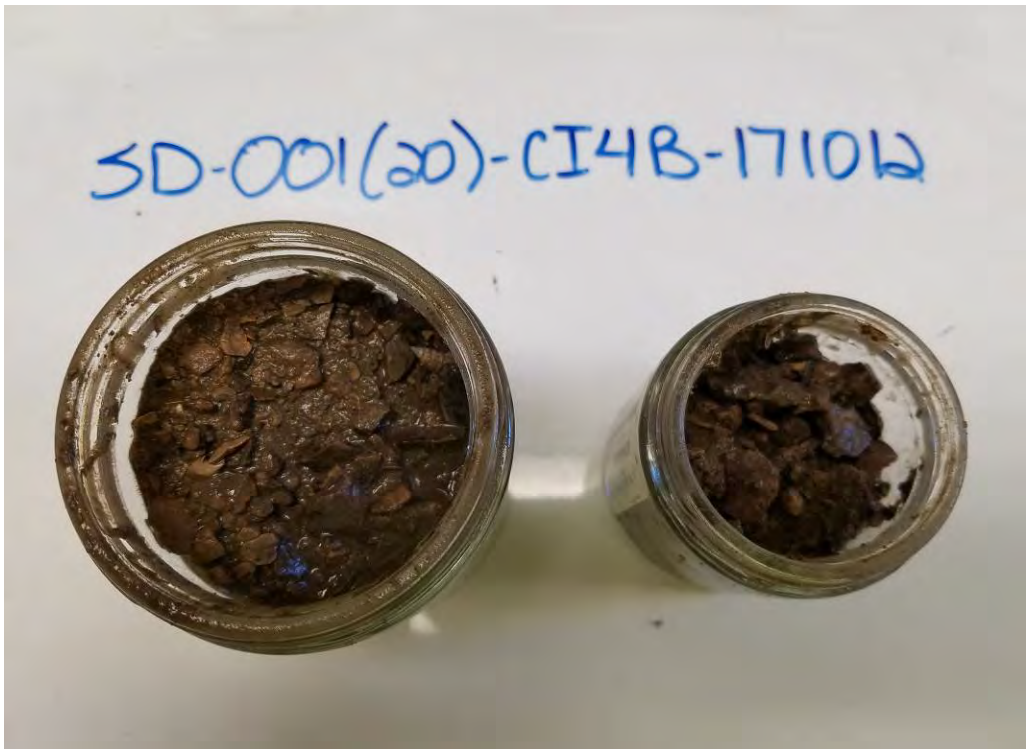


Photo 11: Sediment sample collected from CI4B (Mouth of Curds Inlet), Lower Herrington Lake. Sample ID = SD-001(20)-CI4B-171012

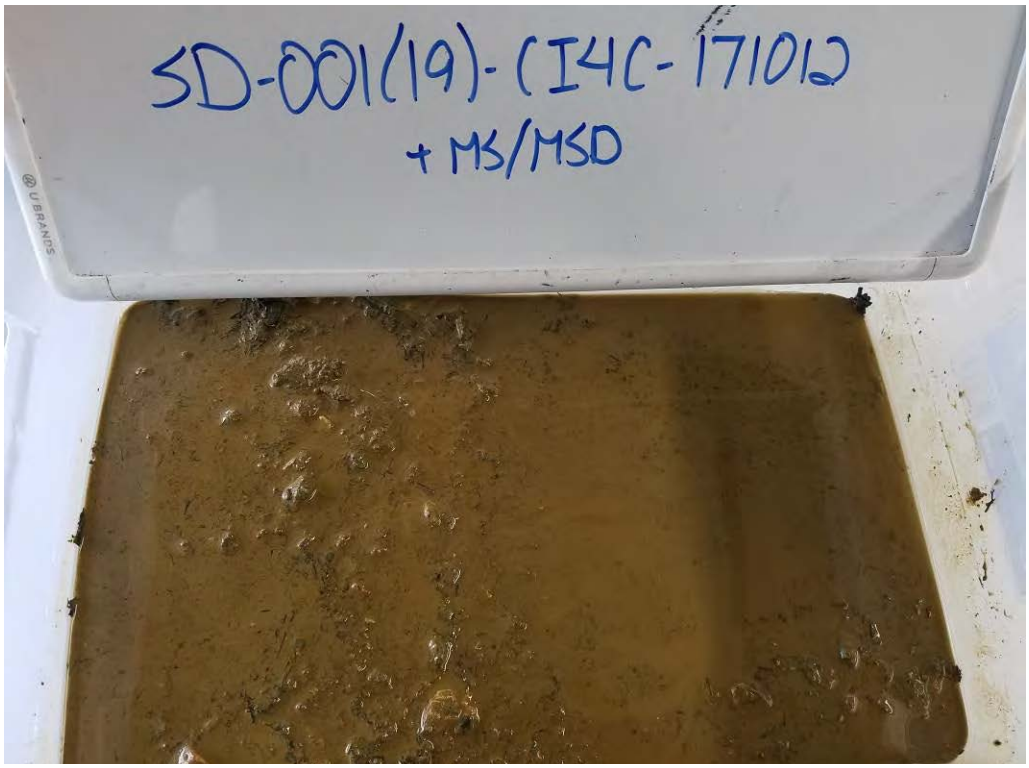


Photo 12: Sediment Sample Collected from CI4C (Mouth of Curds Inlet), Lower Herrington Lake. Sample ID = SD-001(19)-CI4C-171012, SD-001(19)-CI4C-171012-MS/MSD

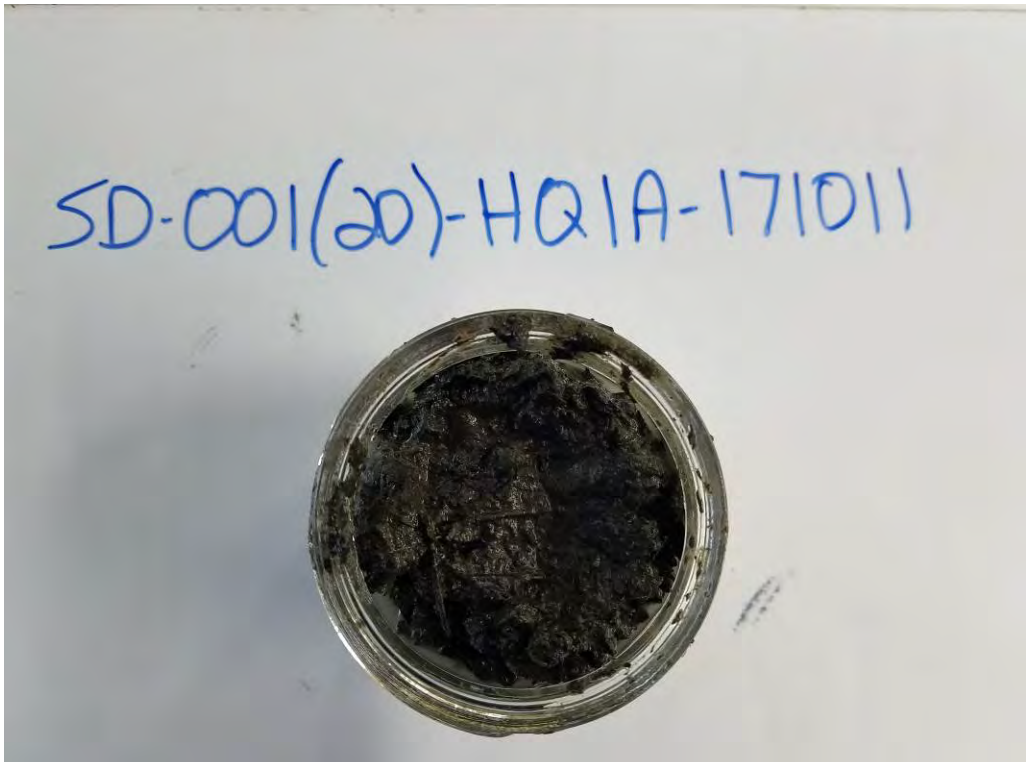


Photo 13: Sediment sample collected from HQ1A (HQ Inlet), Lower Herrington Lake.
Sample ID = SD-001(20)-HQ1A-171011

Photo 14: Sediment sample collected from HQ1B (HQ Inlet), Lower Herrington Lake.
Sample ID = SD-001(17)-HQ1B-171011

Photo 15: Sediment sample collected from HQ1C (HQ Inlet), Lower Herrington Lake.
Sample ID = SD-001(13)-HQ1C-171011

Photo 16: Sediment sample collected from LHL1B (Lower Herrington Lake).
Sample ID = SD-001(20)-LHL1B-171012

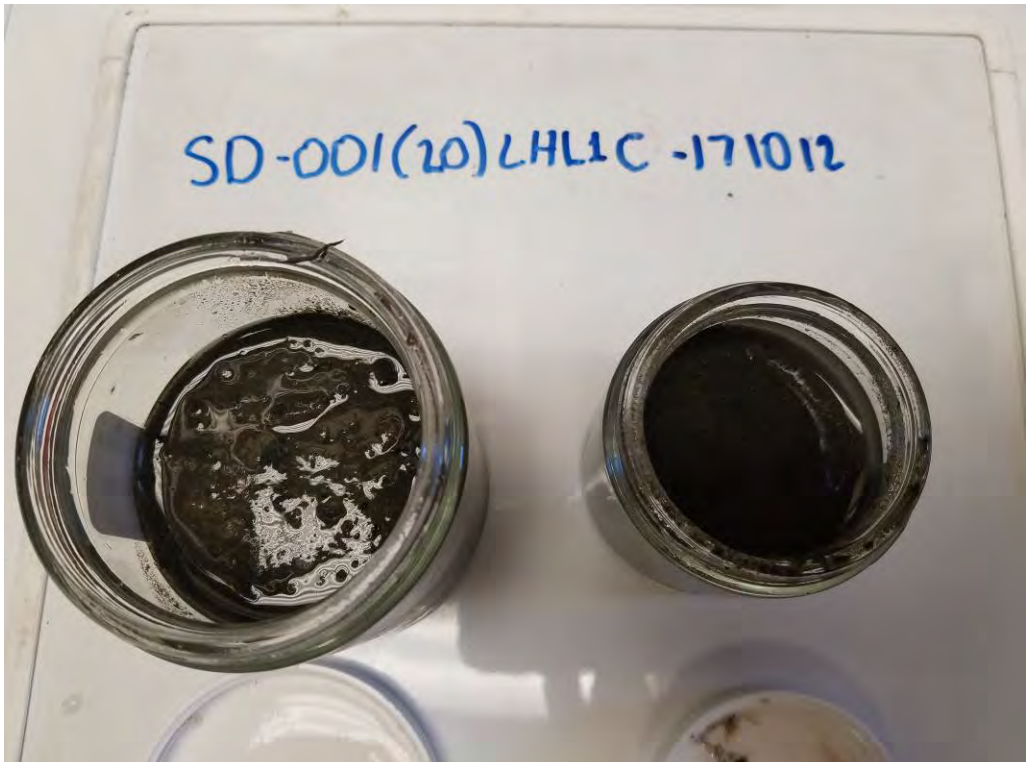


Photo 17: Sediment sample collected from LHL1C (Lower Herrington Lake).
Sample ID = SD-001(20)-LHL1C-171012

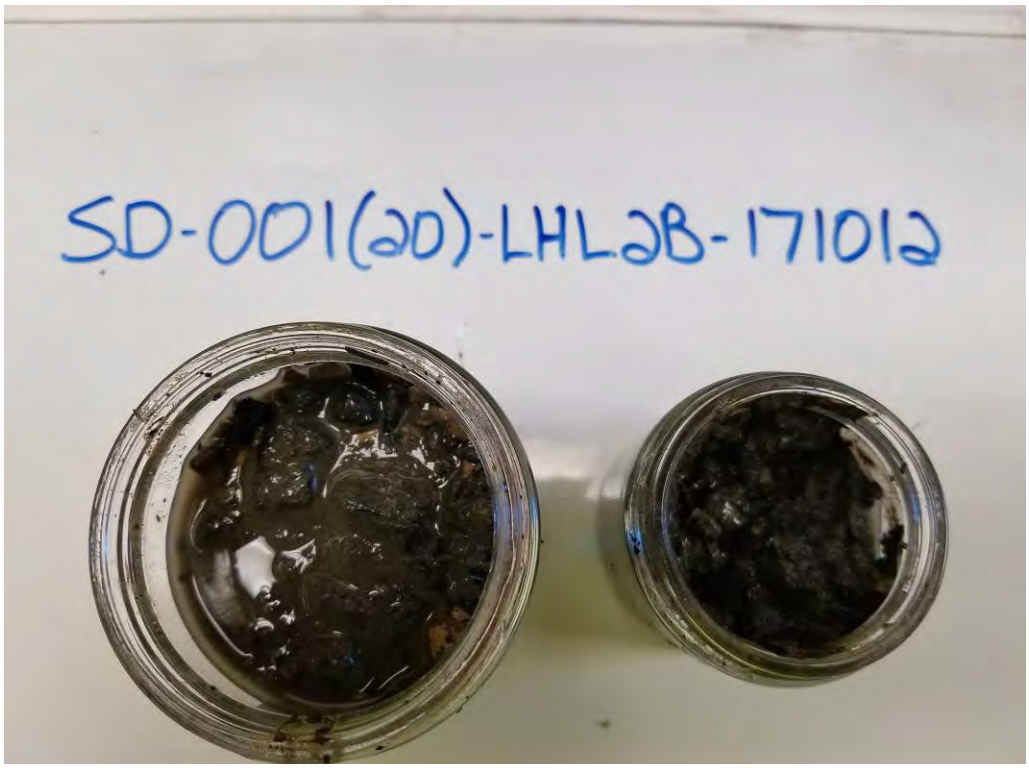


Photo 18: Sediment sample collected from LHL2B (Lower Herrington Lake).
Sample ID = SD-001(20)-LHL2B-171012

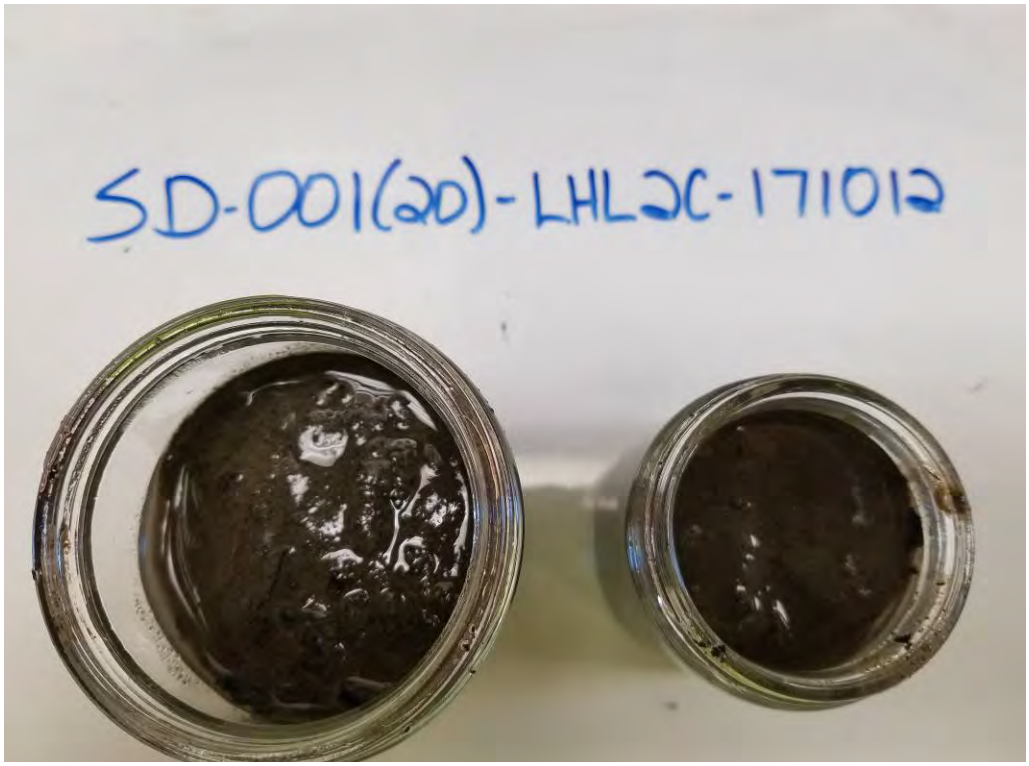


Photo 19: Sediment sample collected from LHL2C (Lower Herrington Lake).
Sample ID = SD-001(20)-LHL2C-171012

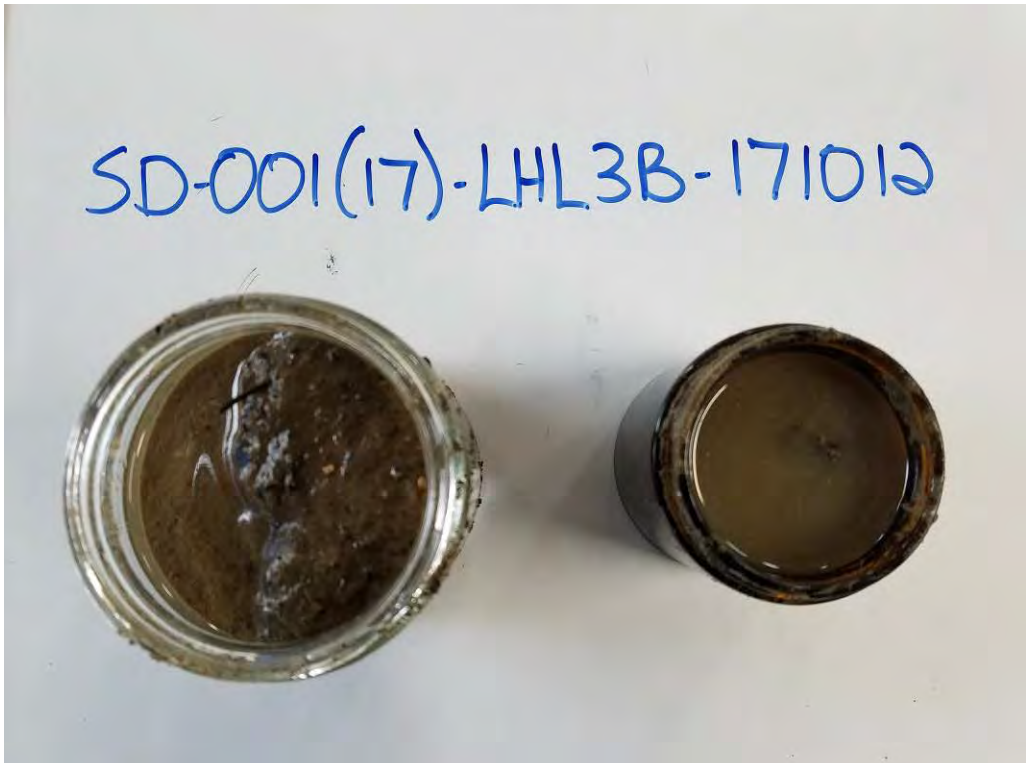


Photo 20: Sediment sample collected from LHL3B (Lower Herrington Lake).
Sample ID = SD-001(17)-LHL3B-171012

Photo 21: Sediment sample collected from LHL3C (Lower Herrington Lake).
Sample ID = SD-001(24)-LHL3C-171012

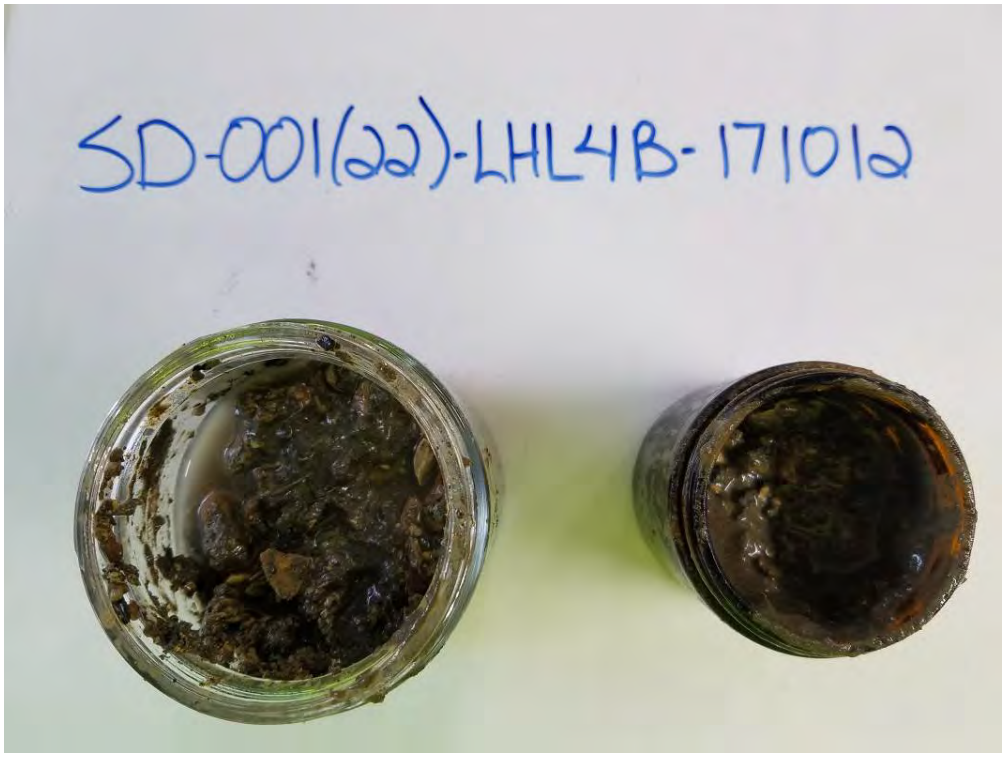


Photo 22: Sediment sample collected from LHL4B (Lower Herrington Lake).
Sample ID = SD-001(22)-LHL4B-171012

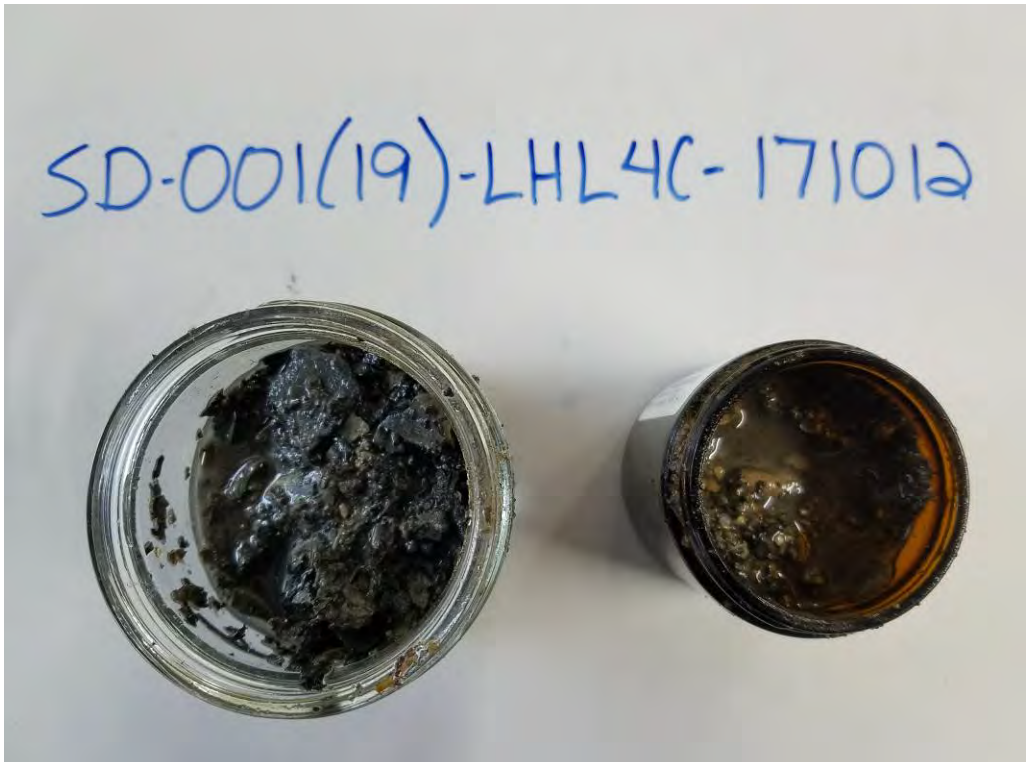


Photo 23: Sediment sample collected from LHL4C (Lower Herrington Lake).
Sample ID = SD-001(19)-LHL4C-171012

Photo 24: Sediment sample collected from LHL5B (Lower Herrington Lake).
Sample ID = SD-001(16)-LHL5B-171012

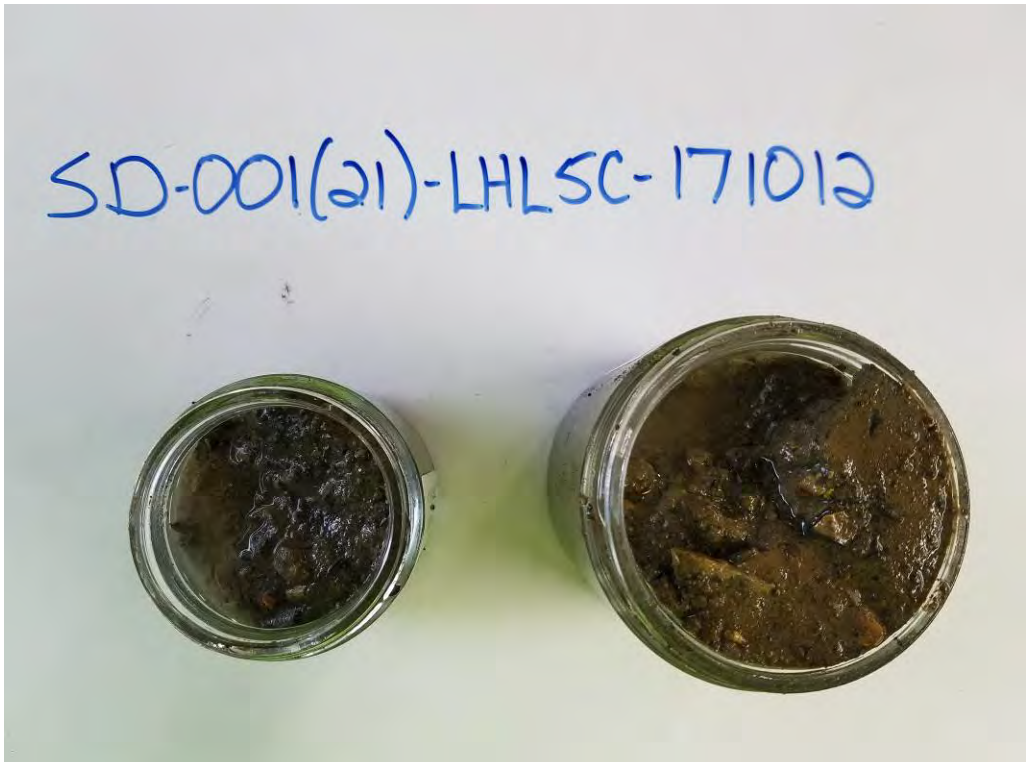


Photo 25: Sediment sample collected from LHL5C (Lower Herrington Lake).
Sample ID = SD-001(21)-LHL5C-171012

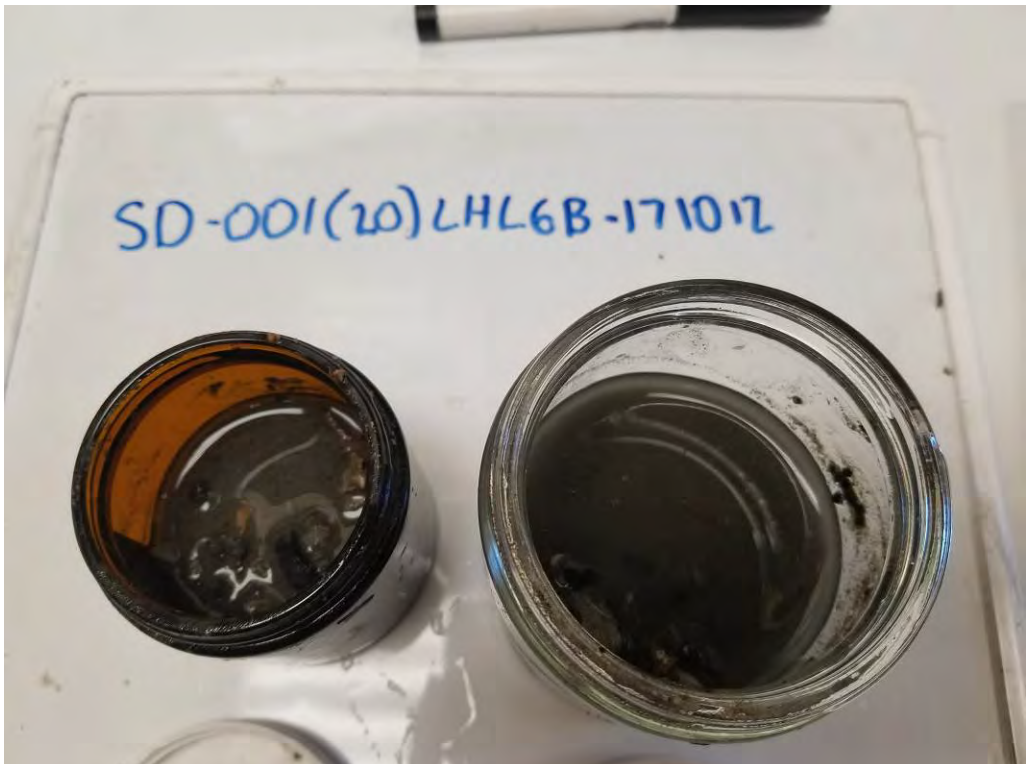


Photo 26: Sediment sample collected from LHL6B (Lower Herrington Lake).
Sample ID = SD-001(20)-LHL6B-171012

Photo 27: Sediment sample collected from LHL6C (Lower Herrington Lake).
Sample ID = SD-001(20)-LHL6C-171012

Photo 28: Sediment sample collected from Dix River (downstream of the dam).
Sample ID = SD-001(1)-DR1-171016

APPENDIX B: PHOTO LOGS

Appendix B6: Aquatic Vegetation and Invertebrate Sample Photo Log

Photo 1: Crayfish sample collected From CI1 (Upper Curds Inlet), Lower Herrington Lake. Sample ID = AI-001-CI1-171004

Photo 2: Crayfish sample collected From CI2 (Curds Inlet), Lower Herrington Lake. Sample ID = AI-001-CI2-171005

Photo 3: Aquatic invertebrates (Mayflies) collected from CI3 (Curds Inlet), Lower Herrington Lake. Sample ID = AI-001-CI3-171005

Photo 4: Crayfish and snails collected from CI3 (Curds Inlet), Lower Herrington Lake. Sample ID = AI-001-CI3-171005

Photo 5: Crayfish collected from CI3 (Curds Inlet), Lower Herrington Lake.
Sample ID = AI-001-CI3-171005

Photo 6: Crayfish sample collected from CI4 (Curds Inlet), Lower Herrington Lake.
Sample ID = AI-001-CI4-171005

Photo 7: Crayfish sample collected from Dix River (below Dix Dam).
Sample ID = AI-001-DR-171007

Photo 8: Crayfish sample collected from LHL1 (Rocky Fork).
Sample ID = AI-001-LHL1-171012

Photo 9: Crayfish sample collected from LHL2 (Dix Dam).
Sample ID = AI-001-LHL2-171012

Photo 10: Invertebrate sample collected from LHL2 (Dix Dam).
Sample ID = AI-001-LHL2-171012

Photo 11: Crayfish sample (1 of 2) collected from LHL3 (Lower Herrington Lake).
Sample ID = AI-001-LHL3-171012

Photo 12: Crayfish sample (2 of 2) collected from LHL3 (Lower Herrington Lake).
Sample ID = AI-001-LHL3-171012

Photo 13: Invertebrate sample (1 of 2) collected from LHL3 (Lower Herrington Lake). Sample ID = AI-001-LHL3-171012

Photo 14: Invertebrate sample (2 of 2) collected from LHL3 (Lower Herrington Lake). Sample ID = AI-001-LHL3-171012

Photo 15: Crayfish sample collected from LHL4 (Lower Herrington Lake).
Sample ID = AI-001-LHL4-171012

Photo 16: Invertebrate sample collected from LHL4 (Lower Herrington Lake).
Sample ID = AI-001-LHL4-171012

Photo 17: Crayfish sample (1 of 2) collected from LHL5 (Lower Herrington Lake).
Sample ID = AI-001-LHL5-171012

Photo 18: Crayfish sample (2 of 2) collected from LHL5 (Lower Herrington Lake).
Sample ID = AI-001-LHL5-171012

Photo 19: Invertebrate sample (1 of 2) collected from LHL5 (Lower Herrington Lake). Sample ID = AI-001-LHL5-171012

Photo 20: Invertebrate sample (2 of 2) collected from LHL5 (Lower Herrington Lake). Sample ID = AI-001-LHL5-171012

Photo 21: Crayfish sample (1 of 2) collected from LHL6 (Lower Herrington Lake).
Sample ID = AI-001-LHL6-171012

Photo 22: Crayfish sample (2 of 2) collected from LHL6 (Lower Herrington Lake).
Sample ID = AI-001-LHL6-171012

Photo 23: Invertebrate sample (1 of 3) collected from LHL6 (Lower Herrington Lake). Sample ID = AI-001-LHL6-171012

Photo 24: Invertebrate sample (2 of 3) collected from LHL6 (Lower Herrington Lake). Sample ID = AI-001-LHL6-171012

Photo 25: Invertebrate sample (3 of 3) collected from LHL6 (Lower Herrington Lake).
Sample ID = AI-001-LHL6-171012

Photo 26: Crayfish sample collected from HQ Inlet (Lower Herrington Lake).
Sample ID = AI-001-HQ-171006

Photo 27: Invertebrate Sample Collected from HQ Inlet (Lower Herrington Lake). Sample ID = AI-001-HQ-171006

Photo 28: Aquatic vegetation sample collected from CI1 (Upper Curds Inlet), Lower Herrington Lake. Sample ID = AV-001-CI1-171004

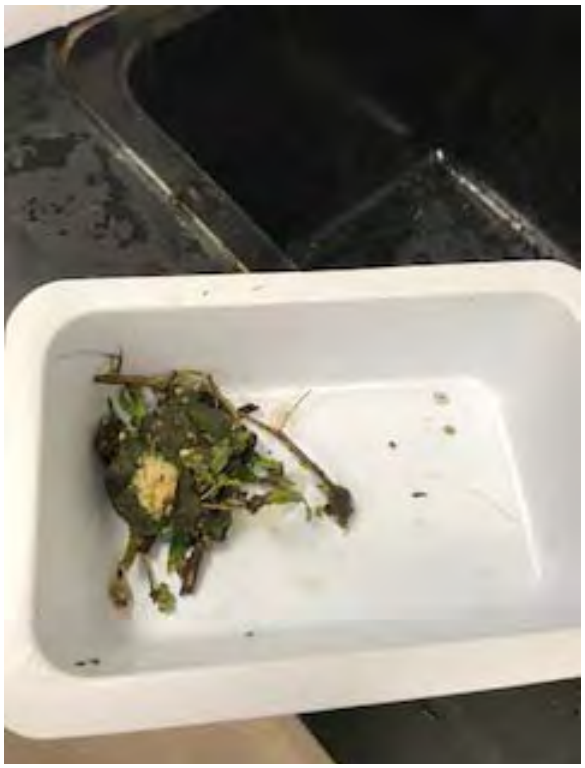


Photo 29: Aquatic vegetation sample collected from CI2 (Curds Inlet), Lower Herrington Lake. Sample ID = AV-001-CI2-171005

Photo 30: Aquatic vegetation sample collected from CI3 (Curds Inlet), Lower Herrington Lake. Sample ID = AV-001-CI3-171005

Photo 31: Aquatic vegetation sample collected from CI4 (Curds Inlet), Lower Herrington Lake. Sample ID = AV-001-CI4-171005

Photo 32: Aquatic vegetation sample (1 of 2) collected from HQ Inlet, Lower Herrington Lake. Sample ID = AV-001-HQ-171006

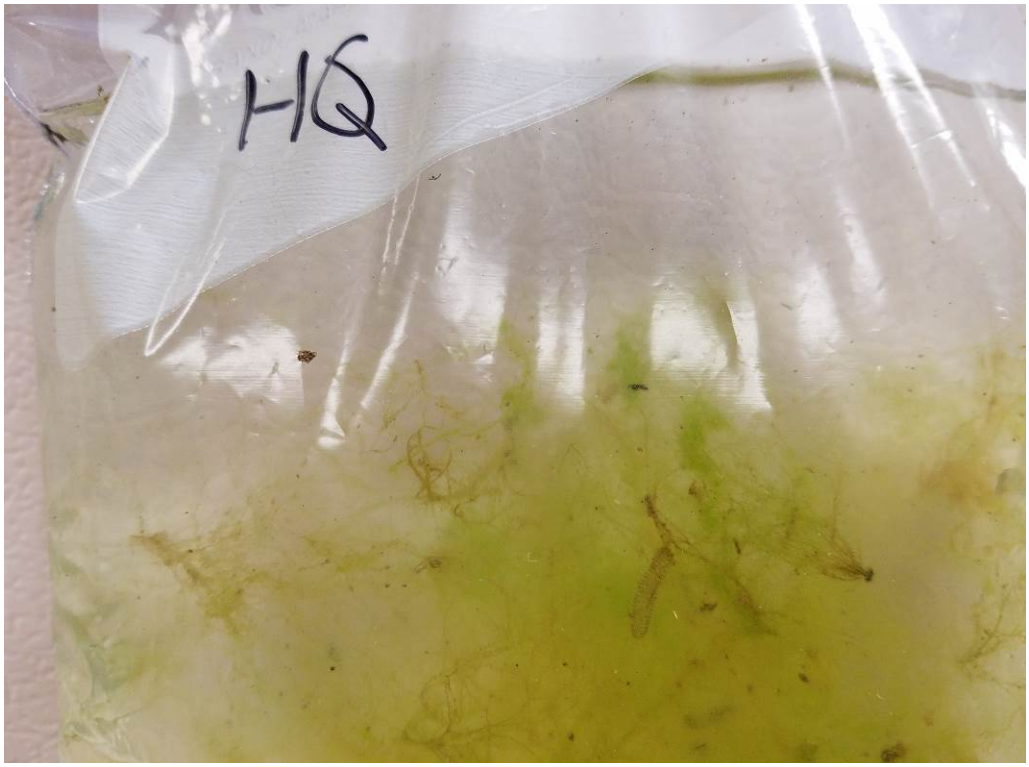


Photo 33: Aquatic vegetation sample (2 of 2) collected from HQ Inlet, Lower Herrington Lake. Sample ID = AV-001-HQ-171006

Photo 34: Aquatic vegetation sample collected from LHL1 (Lower Herrington Lake).
Sample ID = AV-001-LHL1-171012

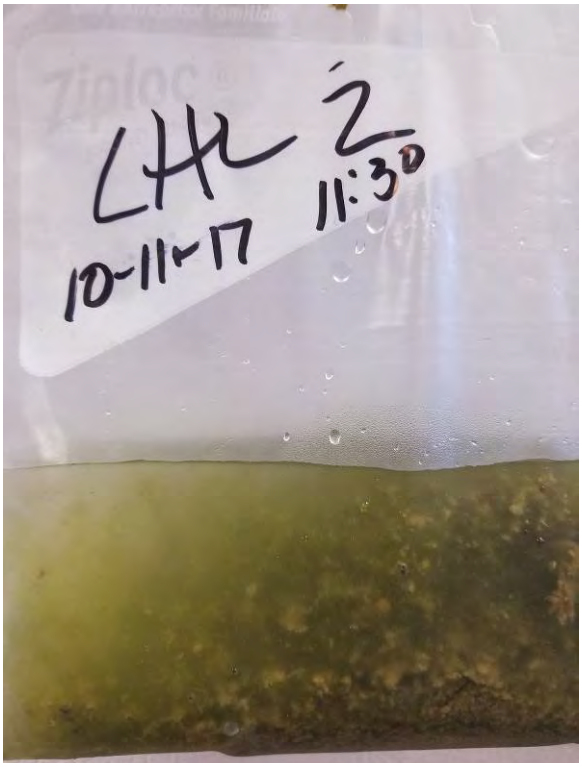


Photo 35: Aquatic vegetation sample (1 of 2) collected from LHL2 (Lower Herrington Lake).
Sample ID = AV-001-LHL2-171012

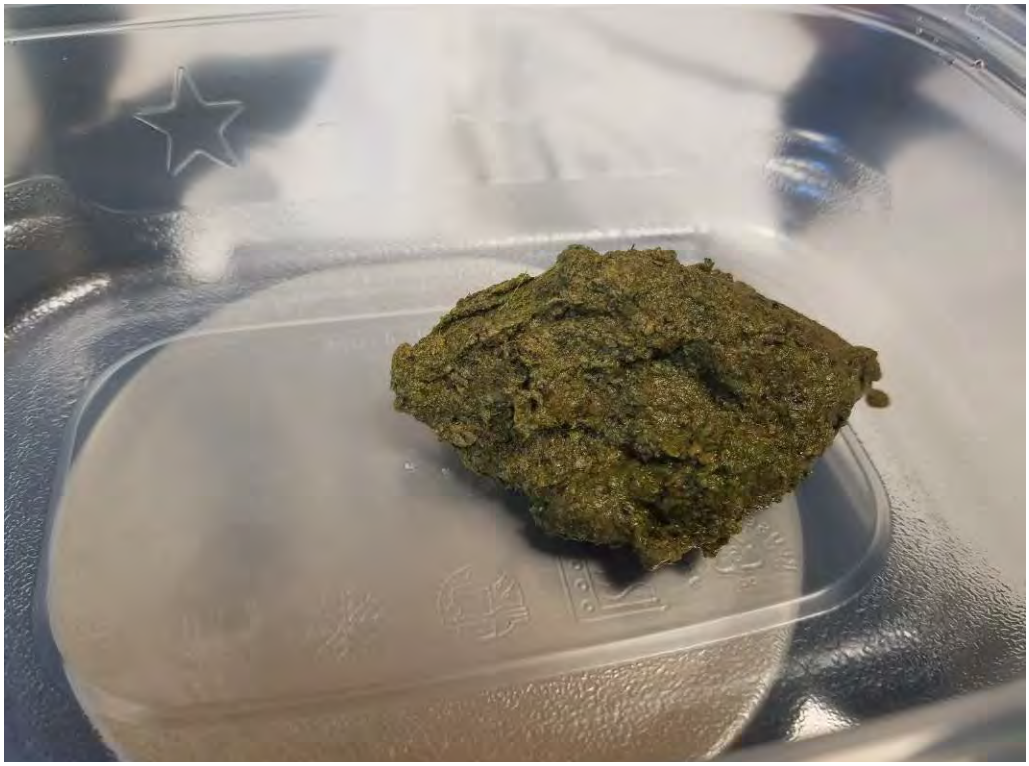


Photo 36: Aquatic vegetation sample (2 of 2) collected from LHL2 (Lower Herrington Lake). Sample ID = AV-001-LHL2-171012

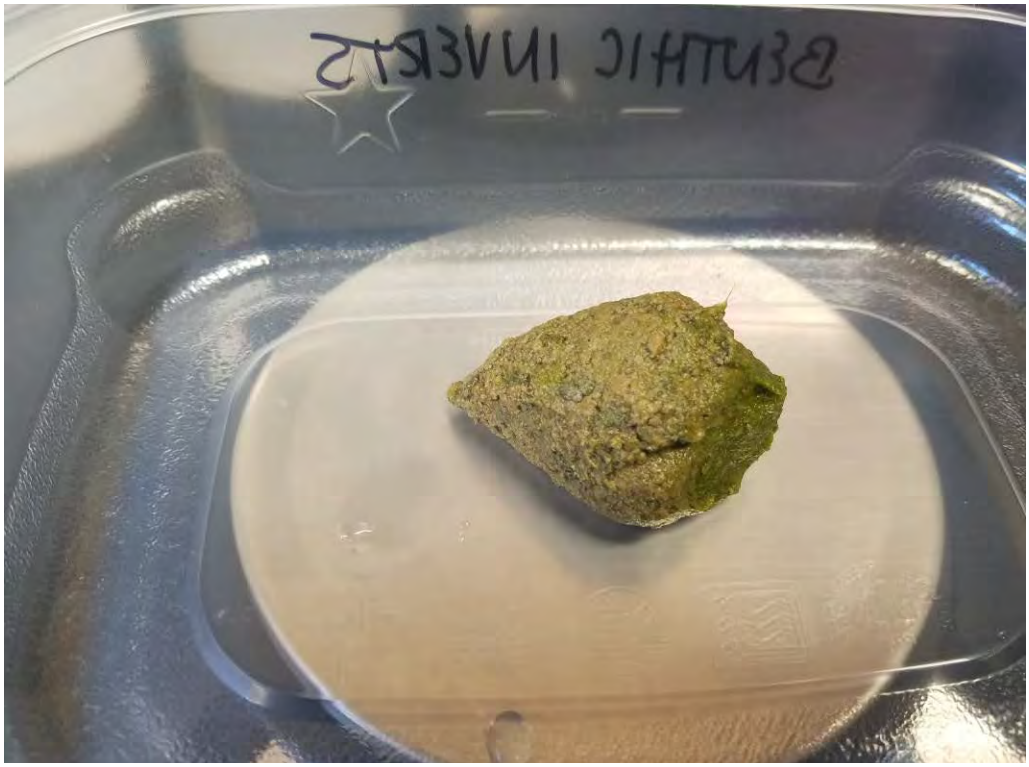


Photo 37: Aquatic vegetation sample collected from LHL3 (Lower Herrington Lake). Sample ID = AV-001-LHL3-171012

Photo 38: Aquatic vegetation sample collected from LHL4 (Lower Herrington Lake).
Sample ID = AV-001-LHL4-171012

Photo 39: Aquatic vegetation sample collected from LHL5 (Lower Herrington Lake).
Sample ID = AV-001-LHL5-171012

Photo 40: Aquatic vegetation sample (1 of 2) collected from LHL6 (Lower Herrington Lake). Sample ID = AV-001-LHL6-171012

Photo 41: Aquatic vegetation sample (2 of 2) collected from LHL6 (Lower Herrington Lake). Sample ID = AV-001-LHL6-171012

Photo 42: Aquatic vegetation sample collected from Dix River (below Dix Dam). Sample ID = AV-001-DR-171007

APPENDIX C: FIELD MEASUREMENTS SUMMARY

Appendix C1: Lake Surface Water Profile Summary Table

Appendix C2: Fish Body Weight and Length Measurements

APPENDIX C: FIELD MEASUREMENTS SUMMARY

Appendix C1: Lake Surface Water Profile Summary Table

Appendix C-1: Surface Water Profiling Results Summary Table
Herrington Lake Phase I Field Sampling Technical Memorandum
Mercer County, Kentucky

Sample Location	Stratification											Overturn										
	Sample Date	Sample Time (Start)	Water Depth (ft. bws)	Turbidity (Secchi Depth (ft. bws)	Water Quality Measurement Depth (ft. bws)	Dissolved Oxygen (DO)	Conductivity (mS/cm)	Water Temperature (c)	pH	Surface Water Sample Depth (ft. bws)	Surface Water Sample ID	Sample Date	Sample Time (Start)	Water Depth (ft. bws)	Turbidity (Secchi Depth (ft. bws)	Water Quality Measurement Depth (ft. bws)	Dissolved Oxygen (DO)	Conductivity (mS/cm)	Water Temperature (c)	pH	Surface Water Sample Depth (ft. bws)	Surface Water Sample ID
CI1 (Upper Curds Inlet)	October 14th, 2017	10:00 AM	10	6.5	5	4.03	0.038	21.83	7.4	5	SW-001(5)CI1-171014	December 11th, 2017	12:30 PM	4	3	--	--	--	--	--	2	SW=001(2)CI1-171211
CI2 (Central / Upper Curds Inlet)	October 14th, 2017	10:45 AM	17	6	10	4.38	0.365	21.76	7.98	10	SW-001(10)CI2-171014	December 11th, 2017	1:00 PM	8	3.5	--	--	--	--	--	4	SW=001(4)CI2-171211
CI3 (Central / Lower Curds Inlet)	October 14th, 2017	11:15 AM	27	6	10	4.49	0.348	21.79	8.14	10	SW-001(10)CI3-171014	December 11th, 2017	1:30 PM	18	6	9	7.03	0.408	13.51	8.04	25	SW=001(25)CI3-171211
CI4 (Lower/ Mouth of Curds Inlet)	October 14th, 2017	12:15 AM	75–90	7	20	3.50	0.339	21.74	8.11	20	SW-002(20)CI4-171014	December 12th, 2017	9:15 AM	--	--	--	--	--	--	--	25	SW=001(25)CI4-171212
					70	1.28	0.300	20.1	7.82	70	SW-001(70)CI4-171014											
HQ (HQ Inlet)	October 4th, 2017	3:35 PM	16	5	10	3.33	0.368	22.33	8.24	10	SW-001(10)HQ1-171004	December 11th, 2017	1:45 PM	18	9	--	--	--	--	--	9	SW=001(9)HQ1-171211
LHL1 (Rocky Run)	October 6th, 2017	4:00 PM	75-110	6	20	2.85	0.314	22.1	8.07	20	SW-001(20)LHL1-171006	December 11th, 2017	11:15 AM	--	8	25	5.56	0.339	13.08	7.92	25	SW001(25)LHL1-171211
					60	0.70	0.292	19.23	7.74	60	SW-002(60)LHL1-171006					--	--	--	--	--		
LHL2 (Dix Dam)	October 6th, 2017	11:21 AM	190	8	10	5.65	0.313	22.47	8.56			December 11th, 2017	9:15 AM	190	9	10	5.34	0.341	13.12	7.86	25	SW-001(25) LHL2
					20	4.11	0.313	22.04	7.86							20	5.37	0.341	13.12	7.86		
					25	3.83	0.316	21.94	7.89	25	SW-001(25)LHL2					25	5.36	0.341	13.12	7.86		
					30	3.55	0.319	21.84	7.92							30	5.35	0.341	13.12	7.86		
					40	2.32	0.333	21.63	7.56							40	5.35	0.341	13.12	7.86		
					50	1.94	0.295	20.29	7.6	50	SW-002(50)LHL2					50	5.33	0.341	13.12	7.86		
					60	3.04	0.283	19.44	7.6							60	5.32	0.341	13.12	7.86		
					70	1.77	0.279	17.71	7.47							70	5.30	0.341	13.12	7.86		
					80	1.72	0.272	15.76	7.47							80	5.28	0.341	13.12	7.86		
					90	1.63	0.262	14.16	7.46							90	5.26	0.341	13.12	7.86		
					100	1.65	0.245	12.82	7.46	100	SW-003(100)LHL2					100	5.26	0.341	13.12	7.85		
					110	1.63	0.246	12.06	7.48							110	5.22	0.341	13.12	7.85		
					120	1.40	0.249	11.35	7.5							120	5.14	0.341	13.11	7.84		
					130	2.84	0.221	10.68	7.56							130	4.65	0.340	12.98	7.80		
					140	2.95	0.230	9.81	7.62							140	2.24	0.339	12.42	7.62		
					150	2.57	0.0.228	9.5	7.67							150	1.68	0.337	12.3	7.56		
LHL3	October 6th, 2017	5:00 PM	160	8	20	3.08	0.315	22.06	7.97	20	SW-001(20)LHL3-171006	December 12th, 2017	12:45 PM	225	9	20	5.42	0.340	13.03	7.90	25	SW001(25)LHL3-171212
					50 (overturn only)	--	--	--	--	--	--					50	5.40	0.340	13.02	7.90		
					70	0.67	0.270	17.82	7.74	70	SW-002(70)LHL3-171006					70	5.41	0.340	13.03	7.91		
					100	0.68	0.248	13.28	7.98	100	SW-003(100)LHL3-171006					90	5.40	0.340	13.03	7.91		
LHL4	October 7th, 2017	3:00 PM	160	7	20	3.63	0.304	21.65	7.95	20	SW-001(20)LHL4-171007	December 12th, 2017	10:15 AM	--	9	--	--	--	--	--	25	SW001(25)LHL4-171212
					70	1.83	0.272	18.44	7.71	70	SW-002(70)LHL4-171007											
					100	1.08	0.243	13.34	8	100	SW-003(100)LHL4-171007											
HI (Hardins Inlet)	October 5th, 2017	3:56 PM	18	6	10	2.75	0.307	22.18	8.37	10	SW-001(10)HI1-171005	December 11th, 2017	2:35 PM	6	5	--	--	--	--	--	3	SW001(3)HI1-171211
LHL5 (NE of Mallard Cove / Cane Run)	October 7th, 2017	10:00 AM	158	8	20	3.95	0.304	21.95	7.73	20	SW-001(20)LHL5-171007	December 12th, 2017	10:45 AM	--	8	--	--	--	--	--	25	SW001(25)LHL5-171212
					70	1.18	0.274	17.83	7.22	70	SW-002(70)LHL5-171007											
					100	0.90	0.258	13.12	7.32	100	SW-003(100)LHL5-171007											
LHL6	October 7th, 2017	1:00 PM	130	8	20	4.56	0.287	21.6	7.69	20	SW-001(20)LHL6-171007	December 12th, 2017	12:00 PM	200	7	20	5.05	0.330	13.08	7.87	25	SW001(25)LHL5-171212
					50 (overturn only)	--	--	--	--	--	--					50	5.05	0.330	13.08	7.87		
					70	2.46	0.270	18.37	7.57	70	SW-002(70)LHL6-171007					70	5.00	0.330	13.08	7.87		
					100	2.41	0.238	13.44	7.84	100	SW-003(100)LHL6-171007					90	4.98	0.329	13.08	7.87		

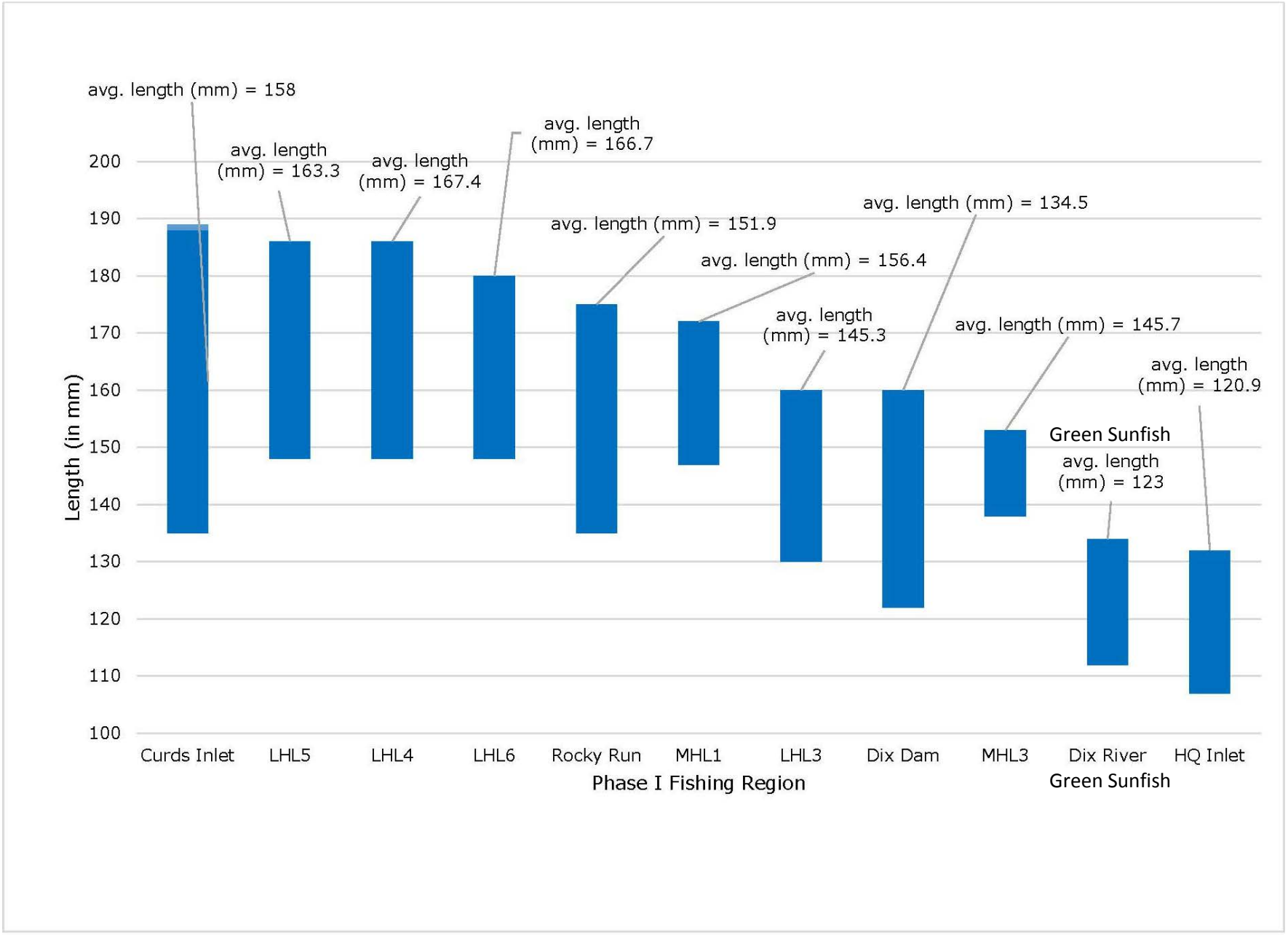
Notes:

CI Curds
HI Hardin
HQ HQ Inlet
LHL Lower Herrington Lake
MHL Middle Herrington Lake
DR Dix River

(mS/cm) microseimens per centimeter
ft. bws Feet below water surface
SW Surface Water
-- no value
DO Dissolved Oxygen

APPENDIX C: FIELD MEASUREMENTS SUMMARY

Appendix C2: Fish Body Weight and Length Measurements



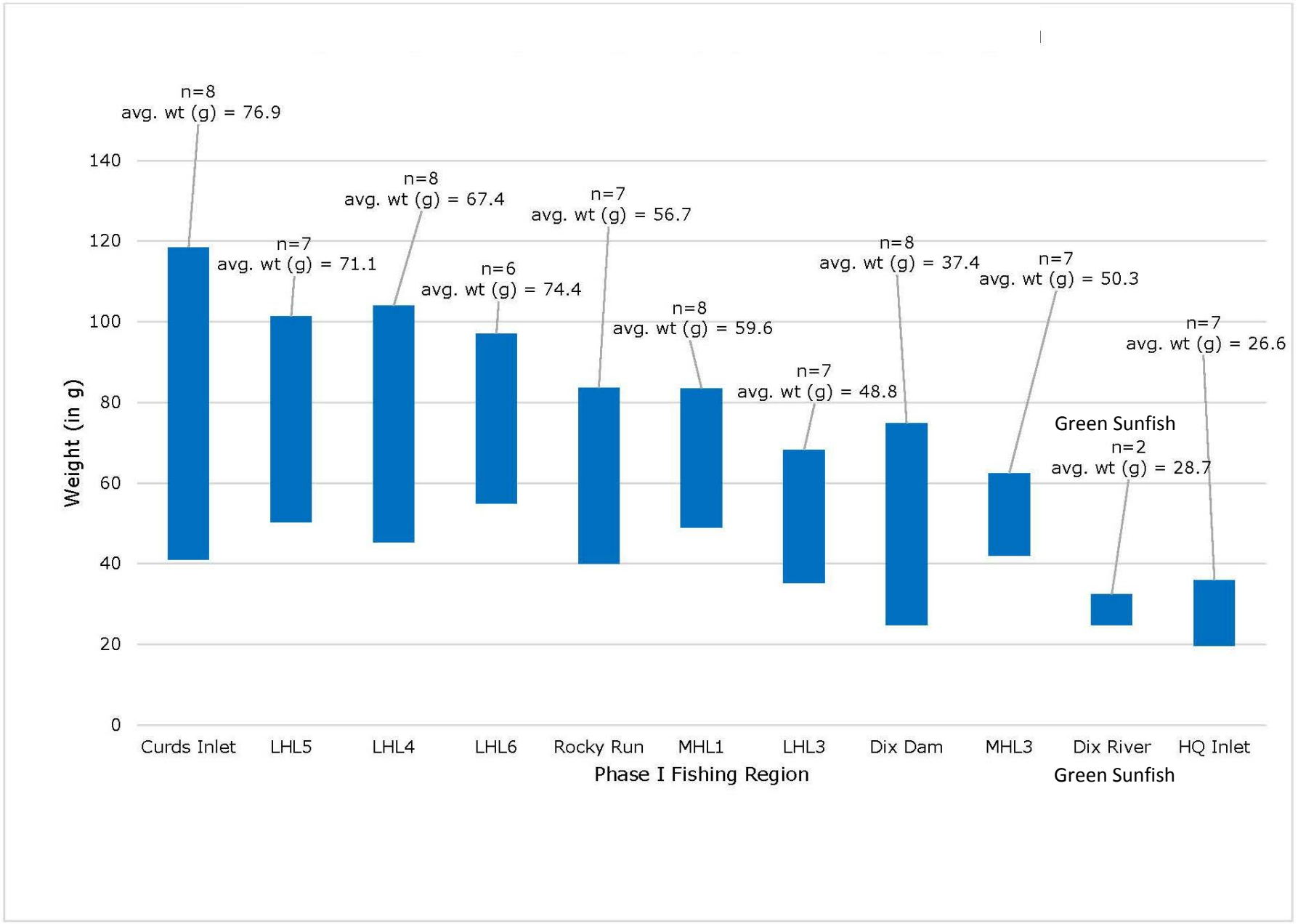
RAMBOLL

DRAFTED BY: AJS, April 17, 2018

Bluegill and Green Sunfish Length Ranges (in millimeters) by Fishing Region

Herrington Lake CAP Phase 1 Technical Memorandum
Mercer County, Kentucky

Appendix C1-A



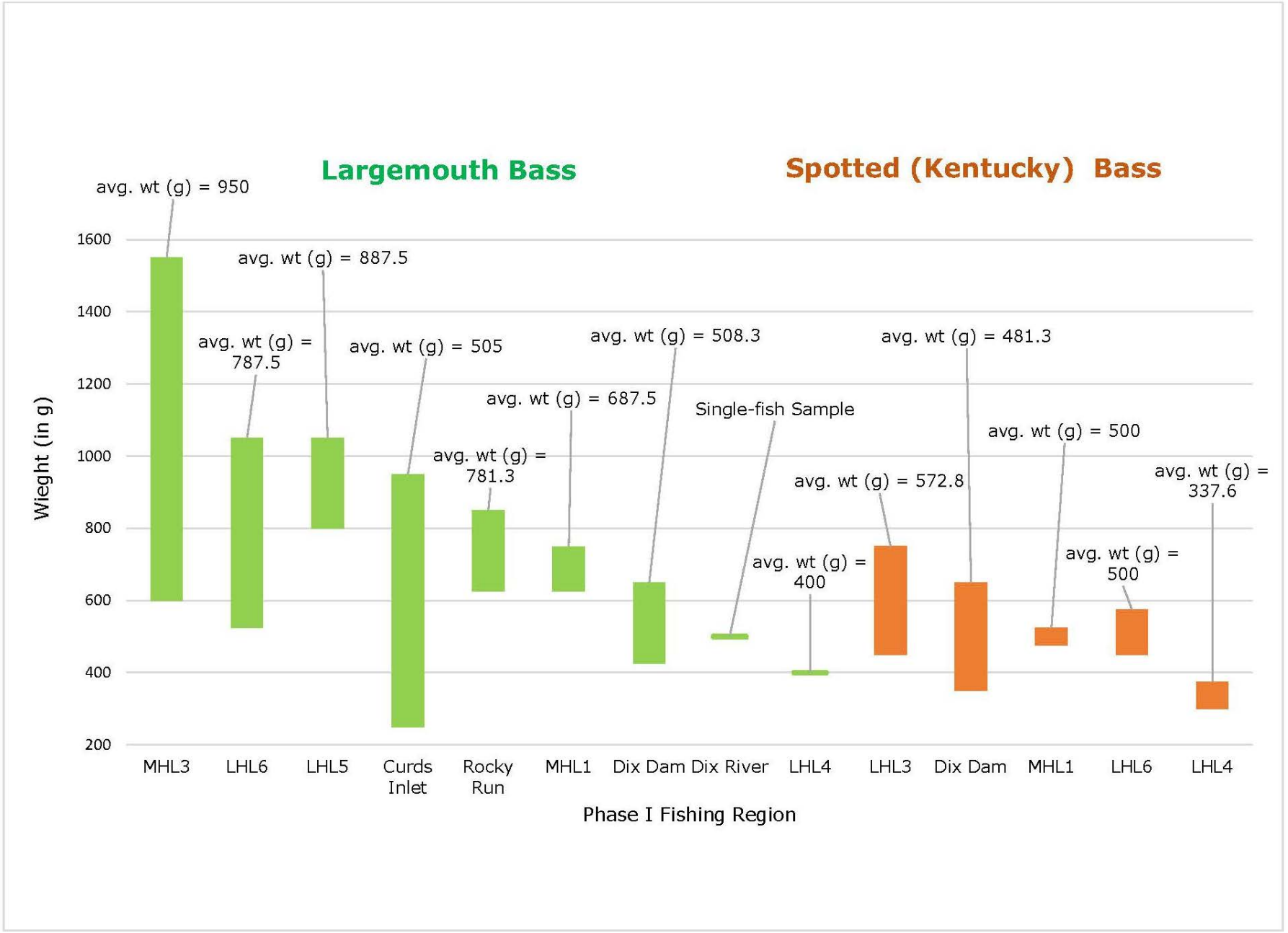
RAMBOLL

DRAFTED BY: AJS, April 17, 2018

Bluegill and Green Sunfish Weight Ranges (in grams) by Fishing Region

Herrington Lake CAP Phase 1 Technical Memorandum
Mercer County, Kentucky

Appendix C1-B



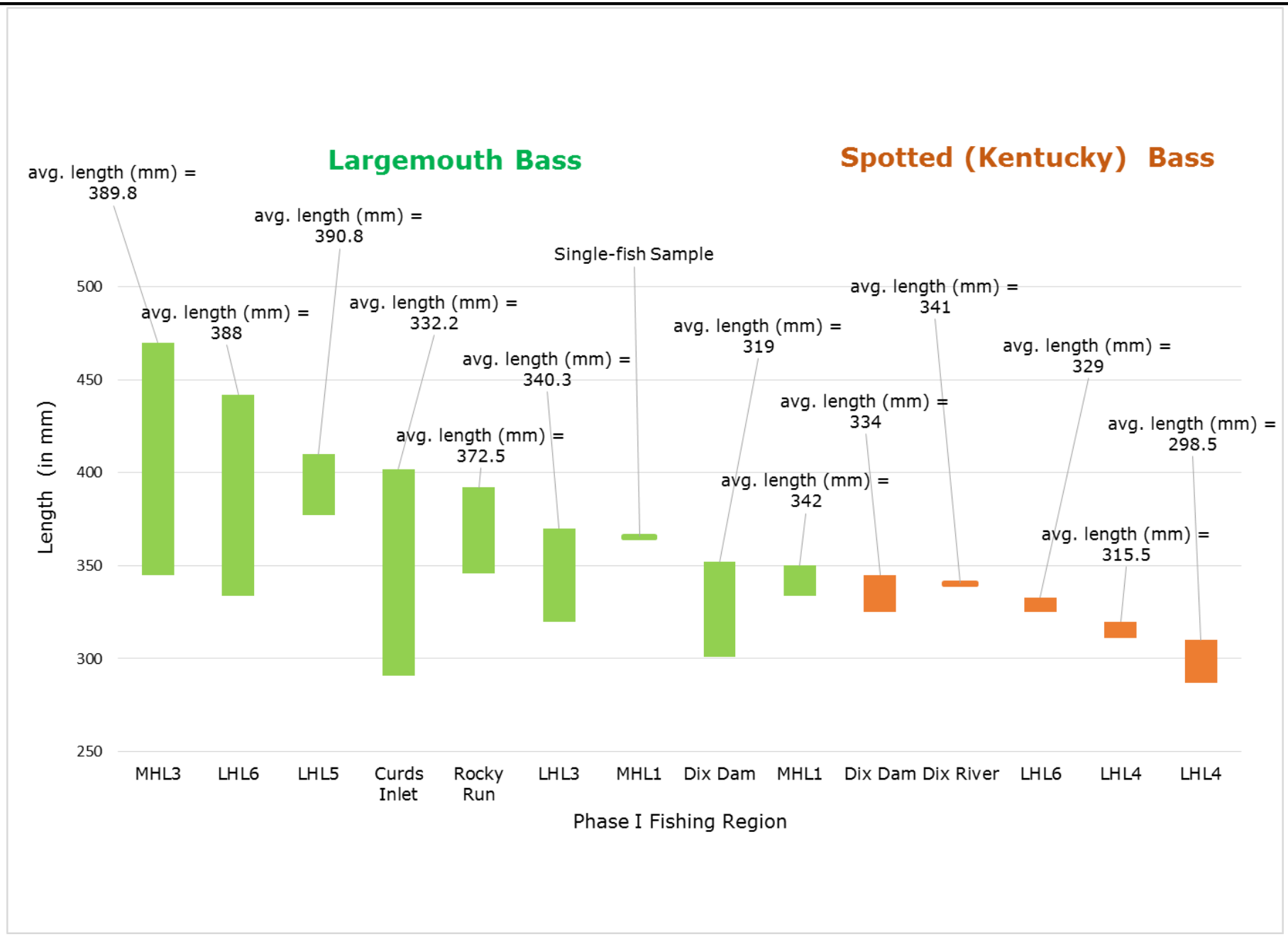
RAMBOLL

DRAFTED BY: AJS, April 17, 2018

Largemouth and Spotted (Kentucky) Bass Weight Ranges (in grams) by Fish Sampling Region

Herrington Lake CAP Phase 1 Technical Memorandum
Mercer County, Kentucky

Appendix C1-C



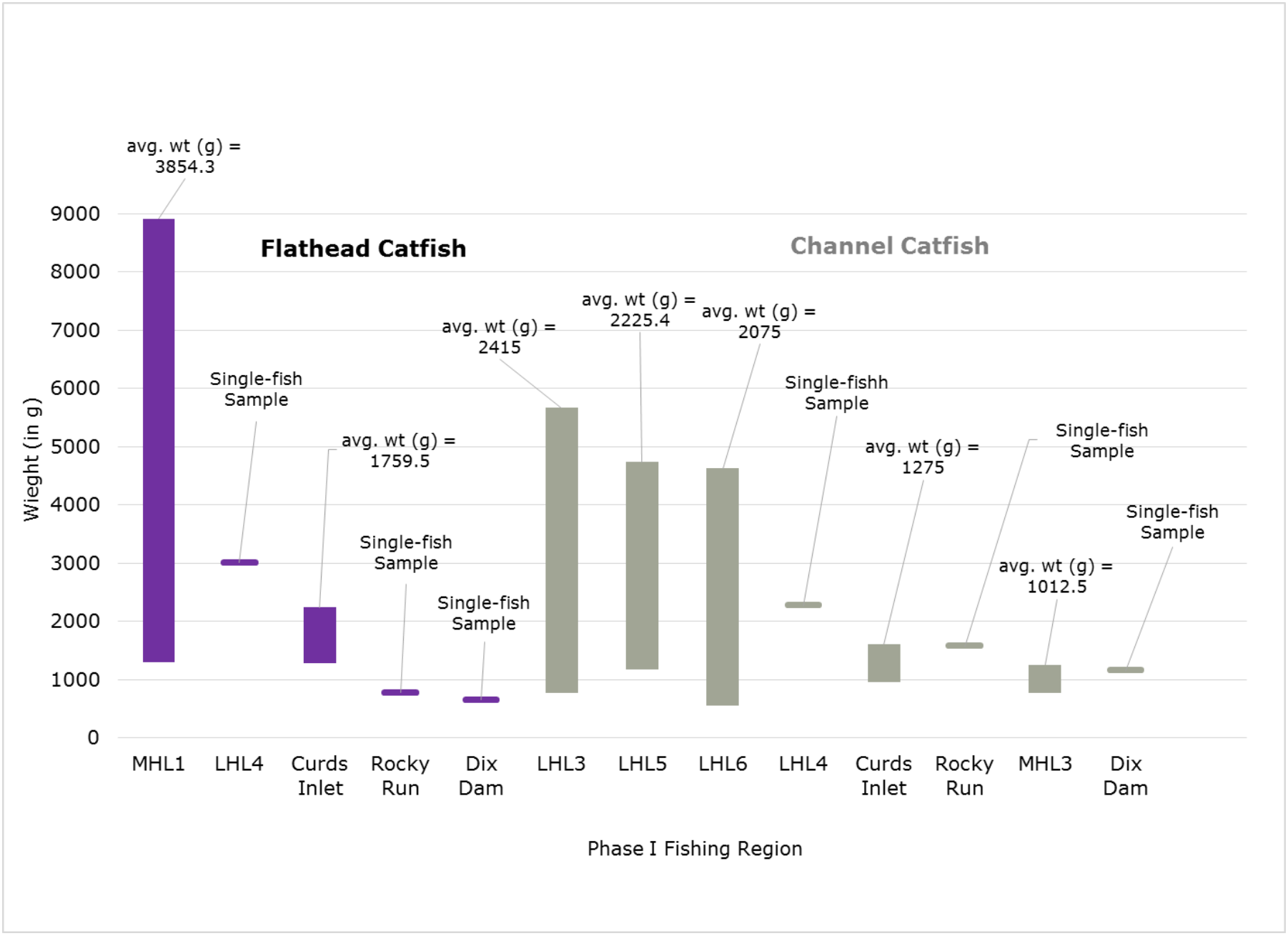
RAMBOLL

DRAFTED BY: AJS, April 17, 2018

Largemouth and Spotted (Kentucky) Bass Length Ranges (in millimeters) by Fish Sampling Region

Herrington Lake CAP Phase 1 Technical Memorandum
Mercer County, Kentucky

Appendix C1-D



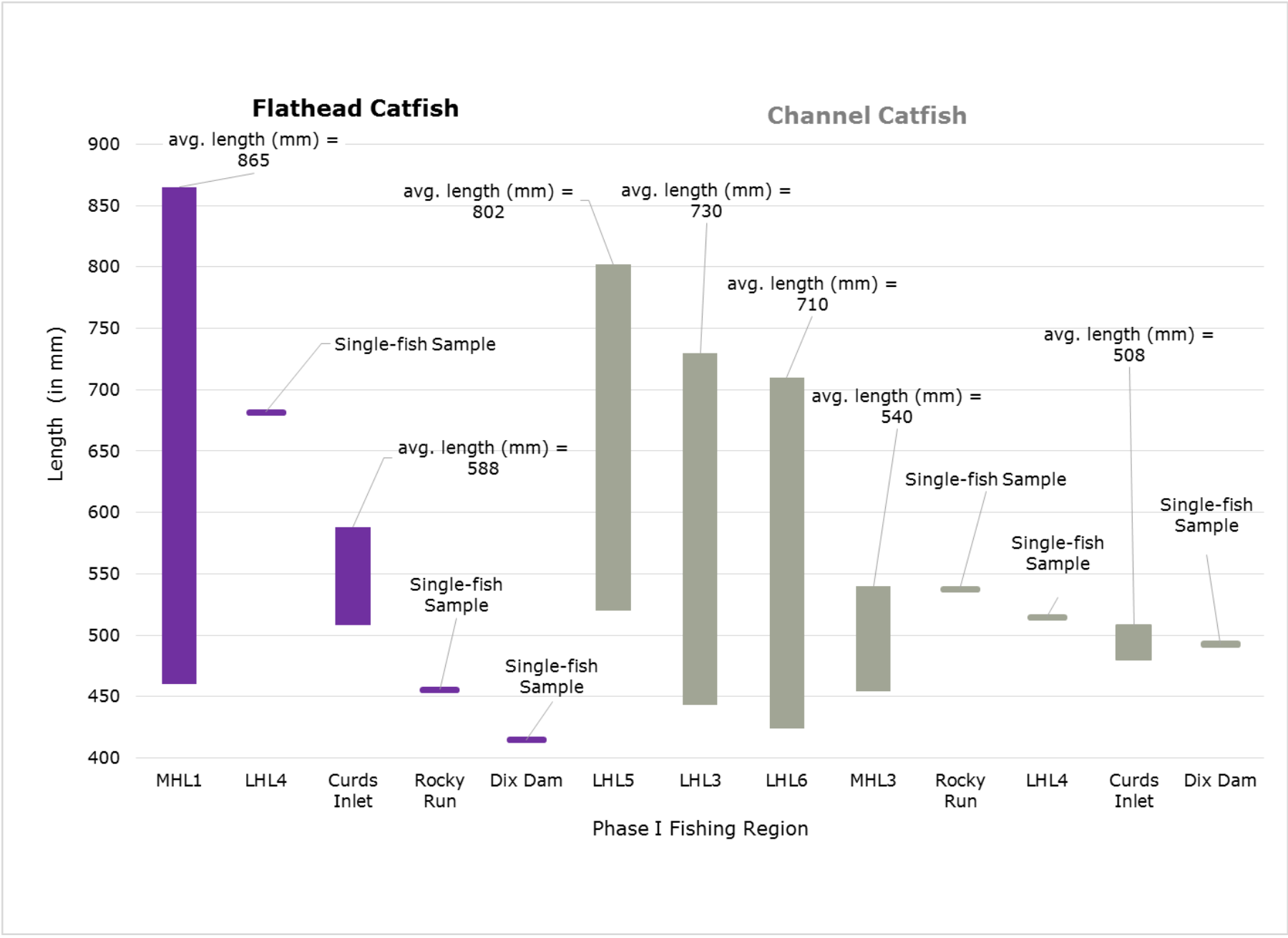
RAMBOLL

DRAFTED BY: AJS, April 17, 2018

Channel and Flathead Catfish Weight Ranges (in grams) by Fish Sampling Region

Herrington Lake CAP Phase 1 Technical Memorandum
Mercer County, Kentucky

Appendix C1-E



RAMBOLL

DRAFTED BY: AJS, April 17, 2018

Channel and Flathead (Kentucky) Bass Length Ranges (in millimeters) by Fish Sampling Region

Herrington Lake CAP Phase 1 Technical Memorandum
Mercer County, Kentucky

Appendix C1-F

APPENDIX D: SAMPLE COLLECTION FIELD DATA SHEETS

Appendix D1: Fish Sample Data Sheets

SELENIUM FISH TISSUE CHAIN-OF-CUSTODY

Station #: Coods Inlet (CI) PG1 **Date:** 10/4/17

Stream / Location: _____ **Time:** _____

KPDES Permit#: SC1711301

County: _____ **Lat/Long Upstream Reach:** _____

Lat/Long Downstream Reach: _____

Outfall #: _____ **Duplicate/Replicate (circle one):** yes no

Flow status (circle one): runoff event high flow low flow normal other

Fish #	Genus	Species	Length (mm)	Comments
KPG 001 S1	LMB		402 mm / 950 gm	F ovary 7.8 gm
002 S1	LMB		350 / 575	
003 S2	LMB		291 / 325	
KP7 004 S2	LMB		323 / 425	
005 S2	LMB		295 / 250	
KP8 006 S1	Bluegill		152 / 69.7	
007 S1	Bluegill		159 / 74.1	

Length (mm) of 75%tile of Longest Fish: _____

Total # Fish Collected in Sample: _____

Collected by: _____	Date: _____	Time: _____
Relinquished by: _____	Date: _____	Time: _____
Received by: _____	Date: _____	Time: _____

SELENIUM FISH TISSUE CHAIN-OF-CUSTODY

Station #: Woods E Pg 2 **Date:** 10/4/17

Stream / Location: _____ **Time:** _____

KPDES Permit#: _____

County: _____ **Lat/Long Upstream Reach:** _____

Lat/Long Downstream Reach: _____

Outfall #: _____ **Duplicate/Replicate (circle one): yes no**

Flow status (circle one): runoff event high flow low flow normal other

Fish #	Genus	Species	Length (mm)	Comments
KPS S1 001/008	Bluegill		135 / 45.5	
S1 002/009	Bluegill		138 / 41.1	
S2 003/010	Bluegill		188 / 118.5	
KPQ S2 004/011	Bluegill		166 / 99.2	
S2 005/012	Bluegill		168 / 90.0	
006	go to Pg 3			
007				

Length (mm) of 75%tile of Longest Fish: _____

Total # Fish Collected in Sample: _____

Collected by: _____	Date: _____	Time: _____
Relinquished by: _____	Date: _____	Time: _____
Received by: _____	Date: _____	Time: _____

SELENIUM FISH TISSUE CHAIN-OF-CUSTODY

Station #: Lords Trib pg 3 **Date:** 10/7/17

Stream / Location: _____ **Time:** _____

KPDES Permit#: SC171301

County: _____ **Lat/Long Upstream Reach:** _____

Lat/Long Downstream Reach: _____

Outfall #: _____ **Duplicate/Replicate (circle one): yes no**

Flow status (circle one): runoff event high flow low flow normal other

Fish #	Genus	Species	Length (mm)	Comments
001 013	Ch	Catfish	680/3348	M
002				
003				
004				
005				
006				
007				

Length (mm) of 75%tile of Longest Fish: _____

Total # Fish Collected in Sample: _____

Collected by: _____	Date: _____	Time: _____
Relinquished by: _____	Date: _____	Time: _____
Received by: _____	Date: _____	Time: _____

SELENIUM FISH TISSUE CHAIN-OF-CUSTODY

Station #: CURDS INLET pg 4 **Date:** 10-13-17

Stream / Location: _____ **Time:** _____

KPDES Permit#: _____

County: _____ **Lat/Long Upstream Reach:** _____

Lat/Long Downstream Reach: _____

Outfall #: _____ **Duplicate/Replicate (circle one): yes no**

Flow status (circle one): runoff event high flow low flow normal other

Fish #	Genus	Species	Length (mm)	Comments
~~001~~ 014	FLATHEAD CATFISH		588mm / 2342g	OVARY 15.6g F
~~002~~ 015	FLATHEAD		508mm / 1277g	
~~003~~ 016	CHANNEL CATFISH		508mm / 1600g	
~~004~~ 017	CHANNEL		480mm / 950g	M
005				
006				
007				

Length (mm) of 75%tile of Longest Fish: _____

Total # Fish Collected in Sample: _____

Collected by: _____	Date: _____	Time: _____
Relinquished by: _____	Date: _____	Time: _____
Received by: _____	Date: _____	Time: _____

SELENIUM FISH TISSUE CHAIN-OF-CUSTODY

Station #: ~~Hit~~ → Cuds Fidet **Date:** 10/3

Stream / Location: OPTION **Time:** ______

KPDES Permit#: ______

County: ______ **Lat/Long Upstream Reach:** ______

Lat/Long Downstream Reach: ______

Outfall #: ______ **Duplicate/Replicate (circle one):** yes no

Flow status (circle one): runoff event high flow low flow normal other

Vermicell
lots
of tags fish
forget

Fish #	Genus	Species	Length (mm)	Comments
001 Sr	Kentucky Bass		13.5" 346	560g F ovaries stlpr
002	LMB		347	500 M
003				
004				
005				
006				
007				

Length (mm) of 75%tile of Longest Fish: ______
Total # Fish Collected in Sample: ______

Collected by: ______	Date: ______	Time: ______
Relinquished by: ______	Date: ______	Time: ______
Received by: ______	Date: ______	Time: ______

SELENIUM FISH TISSUE CHAIN-OF-CUSTODY

Station #: HQ1 **Date:** 10/4/1

Stream / Location: _____ **Time:** _____

KPDES Permit#: SC/F11301

County: _____ **Lat/Long Upstream Reach:** _____

Lat/Long Downstream Reach: _____

Outfall #: _____ **Duplicate/Replicate (circle one):** yes no

Flow status (circle one): runoff event high flow low flow normal other

Fish #	Genus	Species	Length (mm)		Comments
001	Bluegill		132	36.8	
002	Bluegill		132	26.1	
003	Bluegill		123	29.5	
004	Bluegill		119	26.5	
005	Bluegill		115	22.6	
006	Bluegill		107	19.7	
007			118	26.1	

P3 S1

P4 S2

Length (mm) of 75%tile of Longest Fish: _____

Total # Fish Collected in Sample: _____

Collected by: _____	Date: _____	Time: _____
Relinquished by: _____	Date: _____	Time: _____
Received by: _____	Date: _____	Time: _____

SELENIUM FISH TISSUE CHAIN-OF-CUSTODY

Station #: LHL#1 **Date:** 10/5 & 10/6

Stream / Location: _____ **Time:** _____

KPDES Permit#: SC1719301

County: _____ **Lat/Long Upstream Reach:** _____

Lat/Long Downstream Reach: _____

Outfall #: _____ **Duplicate/Replicate (circle one):** yes no

Flow status (circle one): runoff event high flow low flow normal other

Fish #	Genus	Species	Length (mm) / g	Comments
001	CH Catfish		538 / 1575	M
S1 002	LMB		372 / 825	F ovary = 4.1 gm
S1 003	LMB		392 / 850	
S2 004 10/6	LMB		380 / 825	
S2 005 10/6	LMB		346 / 625	
~~006~~				
~~007~~				

Length (mm) of 75%tile of Longest Fish: _____

Total # Fish Collected in Sample: _____

Collected by: DMC / DES	Date: _____	Time: _____
Relinquished by: _____	Date: _____	Time: _____
Received by: _____	Date: _____	Time: _____

SELENIUM FISH TISSUE CHAIN-OF-CUSTODY

Station #: LHL1 **Date:** Oct 11, 2017

Stream / Location: _____ **Time:** _____

KPDES Permit#: _____

County: _____ **Lat/Long Upstream Reach:** _____

Lat/Long Downstream Reach: _____

Outfall #: _____ **Duplicate/Replicate (circle one): yes no**

Flow status (circle one): runoff event high flow low flow normal other

	Fish #	Genus	Species	Length (mm)	Comments
Sample 1	~~001~~ 006	Blue gill		83.7g 175mm	
	~~002~~ 007	Blue gill		56.2g 150mm	
	~~003~~ 008	Blue gill		72.4g 165mm	
Sample 2	~~004~~ 009	Blue gill		40.4g 139mm	
	~~005~~ 010	Blue gill		59.2g 154mm	
	006 011	Blue gill		40.6g 135mm	
	007 012	Blue gill		44.9g 145mm	

Length (mm) of 75%tile of Longest Fish: _____

Total # Fish Collected in Sample: _____

Collected by: _____	Date: _____	Time: _____
Relinquished by: _____	Date: _____	Time: _____
Received by: _____	Date: _____	Time: _____

SELENIUM FISH TISSUE
CHAIN-OF-CUSTODY

Station #: LHL 1 **Date:** Oct 11, 2017

Stream / Location: _____ **Time:** _____

KPDES Permit#: _____

County: _____ **Lat/Long Upstream Reach:** _____

Lat/Long Downstream Reach: _____

Outfall #: _____ **Duplicate/Replicate (circle one): yes no**

Flow status (circle one): runoff event high flow low flow normal other

Fish #	Genus	Species	Length (mm)	Comments
~~001~~ 013	FHC		775g 456mm	
002				
003				
004				
005				
006				
007				

Length (mm) of 75%tile of Longest Fish: _____
Total # Fish Collected in Sample: _____

Collected by: _____	Date: _____	Time: _____
Relinquished by: _____	Date: _____	Time: _____
Received by: _____	Date: _____	Time: _____

SELENIUM FISH TISSUE CHAIN-OF-CUSTODY

Station #: LHL2 pg 3 **Date:** 10/5

Stream / Location: _____ **Time:** _____

KPDES Permit#: SC171301

County: _____ **Lat/Long Upstream Reach:** _____

Lat/Long Downstream Reach: _____

Outfall #: _____ **Duplicate/Replicate (circle one): yes no**

Flow status (circle one): runoff event high flow low flow normal other

Fish #	Genus	Species	Length (mm)	Comments
001 015	LMB		345/650	M
SL 002 016	LMB		325/425	M
003 017	LMB		332/450	M
004 018	LMB		306/400	M
SL 005 019	LMB		290/325	M
006				
007				

Length (mm) of 75%tile of Longest Fish: _____

Total # Fish Collected in Sample: _____

Collected by: _____	Date: _____	Time: _____
Relinquished by: _____	Date: _____	Time: _____
Received by: _____	Date: _____	Time: _____

SELENIUM FISH TISSUE CHAIN-OF-CUSTODY

Station #: LH12 fg 2 **Date:** 10/5/18

Stream / Location: _____ **Time:** _____

KPDES Permit#: SC1711301

County: _____ **Lat/Long Upstream Reach:** _____

Lat/Long Downstream Reach: _____

Outfall #: _____ **Duplicate/Replicate (circle one):** yes no

Flow status (circle one): runoff event high flow low flow normal other

Fish #	Genus	Species	Length (mm)	Comments
52 001 008	Bluegill		127 / 31.1	
002 009	FH Catfish		415 / 650	Male
003 010	Clt Catfish		493 / 1150	Male
004 011	KY Bass		301 / 425	
51 005 012	KY Bass		302 / 350	
006 013	KY Bass		321 / 500	Fovery 4.00pm
007 014	KY Bass		352 / 650	

Length (mm) of 75%tile of Longest Fish: _____

Total # Fish Collected in Sample: _____

Collected by: _____	Date: _____	Time: _____
Relinquished by: _____	Date: _____	Time: _____
Received by: _____	Date: _____	Time: _____

SELENIUM FISH TISSUE CHAIN-OF-CUSTODY

Station #: LHL#2 PS1 **Date:** 10/5/17

Stream / Location: _____ **Time:** _____

KPDES Permit#: SC171301

County: _____ **Lat/Long Upstream Reach:** _____

Lat/Long Downstream Reach: _____

Outfall #: _____ **Duplicate/Replicate (circle one): yes no**

Flow status (circle one): runoff event high flow low flow normal other

Fish #	Genus	Species	Length (mm)	Comments
001	Bluegill		135/39.4	
002 S1	Bluegill		145/47.1	
003	Bluegill		160/74.8	
004	Bluegill		134/30.5	
005 S2	Bluegill		125/25.8	
006	Bluegill		128/25.9	
007	Bluegill		122/24.9	

005 next PS

Length (mm) of 75%tile of Longest Fish: _____

Total # Fish Collected in Sample: _____

Collected by: _____	Date: _____	Time: _____
Relinquished by: _____	Date: _____	Time: _____
Received by: _____	Date: _____	Time: _____

SELENIUM FISH TISSUE CHAIN-OF-CUSTODY

Station #: #LHL#3 PB1 **Date:** 10/5/17

Stream / Location: _____ **Time:** _____

KPDES Permit#: SC1711391

County: _____ **Lat/Long Upstream Reach:** _____

Lat/Long Downstream Reach: _____

Outfall #: _____ **Duplicate/Replicate (circle one):** yes no

Flow status (circle one): runoff event high flow low flow normal other

Fish #	Genus	Species	Length (mm)	Comments
001 S1	Hybrid Stripes		533	2 [illegible] M
002 S1	Hybrid Stripes		541	2130 F ovary = 26x20
003 S2	Hybrid Stripes		416	2150 ~~1350~~ X M
004 S1	Kentucky		330 537	F ovary = 2.9
005 S1	Kenty		320 450	Not sexed
006 S1	Kentucky Bass		332	5140 M
~~007~~				

Length (mm) of 75%tile of Longest Fish: _____

Total # Fish Collected in Sample: _____

Collected by: _____	Date: _____	Time: _____
Relinquished by: _____	Date: _____	Time: _____
Received by: _____	Date: _____	Time: _____

SELENIUM FISH TISSUE
CHAIN-OF-CUSTODY

Station #: LHL#3 pg 2 **Date:** 10/4/17

Stream / Location: ______ **Time:** ______

KPDES Permit#: SC 1711301

County: ______ **Lat/Long Upstream Reach:** ______

Lat/Long Downstream Reach: ______

Outfall #: ______ **Duplicate/Replicate (circle one): yes no**

Flow status (circle one): runoff event high flow low flow normal other

Fish #	Genus	Species	Length (mm)	Comments
P1 S2 001 007	Kentucky	Bass	353	700gr F (P1 0 Leave 4.3gr)
S2 002 008	Kent	Bass	370	750
S2 003 009	Kent	Bass	337	500gr
P2 004 010	Flathead	Catfish	21.5" 550	1700gr F (Not salvageable Ovary)
005				
006				
007				

Length (mm) of 75%tile of Longest Fish: ______
Total # Fish Collected in Sample: ______

Collected by: ______	Date: ______	Time: ______
Relinquished by: ______	Date: ______	Time: ______
Received by: ______	Date: ______	Time: ______

SELENIUM FISH TISSUE CHAIN-OF-CUSTODY

Station #: LHL3 PSA3 **Date:** 10/5/17

Stream / Location: _____ **Time:** _____

KPDES Permit#: SC0711301

County: _____ **Lat/Long Upstream Reach:** _____

Lat/Long Downstream Reach: _____

Outfall #: _____ **Duplicate/Replicate (circle one): yes no**

Flow status (circle one): runoff event high flow low flow normal other

Picture on Ricks

Fish #	Genus	Species	Length (mm) / wt	Comments
001	Bluegill		150 / 51.1	
002 S1	Bluegill		160 / 68.2	
003	Bluegill		158 / 65.9	
004	Bluegill		144 / 45.0	
005 S2	Bluegill		135 / 38.7	
006	Bluegill		140 / 37.4	
007	Bluegill		130 / 35.2	

Length (mm) of 75%tile of Longest Fish: _____

Total # Fish Collected in Sample: _____

Collected by: _____	Date: _____	Time: _____
Relinquished by: _____	Date: _____	Time: _____
Received by: _____	Date: _____	Time: _____

SELENIUM FISH TISSUE
CHAIN-OF-CUSTODY

Station #: LHL #3 ~~#9~~ PS4 **Date:** 10/5/17

Stream / Location: _____ **Time:** _____

KPDES Permit#: _____

County: _____ **Lat/Long Upstream Reach:** _____

Lat/Long Downstream Reach: _____

Outfall #: _____ **Duplicate/Replicate (circle one): yes no**

Flow status (circle one): runoff event high flow low flow normal other

Fish #	Genus	Species	Length (~~mm~~) of	Comments
51 ~~001~~ 008	channel catfish		485 / 800	F no ess – DaSqv missing anal
~~002~~ 0				
003				
004				
005				
006				
007				

Length (mm) of 75%tile of Longest Fish: _____
Total # Fish Collected in Sample: _____

Collected by: _____	Date: _____	Time: _____
Relinquished by: _____	Date: _____	Time: _____
Received by: _____	Date: _____	Time: _____

SELENIUM FISH TISSUE
CHAIN-OF-CUSTODY

Station #: ~~CH~~ LHL3 PS #5 **Date:** 10/6/17

Stream / Location: _____ **Time:** _____

KPDES Permit#: _____

County: _____ **Lat/Long Upstream Reach:** _____

Lat/Long Downstream Reach: _____

Outfall #: _____ **Duplicate/Replicate (circle one): yes no**

Flow status (circle one): runoff event high flow low flow normal other

Fish #	Genus	Species	Length (mm)	Comments
001 S1	CH ~~Catfish~~		443/775	F mercury = 0.44 ppm
002				
003				
004				
005				
006				
007				

Length (mm) of 75%tile of Longest Fish: _____
Total # Fish Collected in Sample: _____

Collected by: _____	Date: _____	Time: _____
Relinquished by: _____	Date: _____	Time: _____
Received by: _____	Date: _____	Time: _____

SELENIUM FISH TISSUE CHAIN-OF-CUSTODY

Station #: LHL3 **Date:** 10/18/17

Stream / Location: Herrington Lake **Time:** 1630

KPDES Permit#: _____

County: _____ **Lat/Long Upstream Reach:** _____

Lat/Long Downstream Reach: _____

Outfall #: _____ **Duplicate/Replicate (circle one): yes no**

Flow status (circle one): runoff event high flow low flow (normal) other

Fish #	Genus	Species	Length (mm)	LHC Comments
001	Channel Catfish	CC	730mm	5070g, 138.27 Gravid
002				
003				
004				
005				
006				
007				

Length (mm) of 75%tile of Longest Fish: _____

Total # Fish Collected in Sample: _____

Collected by: _____	Date: _____	Time: _____
Relinquished by: _____	Date: _____	Time: _____
Received by: _____	Date: _____	Time: _____

SELENIUM FISH TISSUE CHAIN-OF-CUSTODY

Station #: LHL #4 P&I **Date:** 10/3/17

Stream / Location: _____ **Time:** 18 47 from list of day inventory

KPDES Permit#: SC1711301

County: _____ **Lat/Long Upstream Reach:** _____

Lat/Long Downstream Reach: _____

Outfall #: _____ **Duplicate/Replicate (circle one):** yes no

Flow status (circle one): runoff event high flow low flow normal other

Fish #	Genus	Species	Length (mm)	Comments
001 S1	Lepomis	Macrochirus	186	104gr
002 S1	Bluegill		182	88.8gr
003 S1	Bluegill		178	70.3gr
004 S1	Bluegill		168	45.4gr
005 S2	Bluegill		168	65.0gr
006 S2	Bluegill		159	64.2gr
007 S2	Bluegill		150	53.2

S1

Length (mm) of 75%tile of Longest Fish: _____

Total # Fish Collected in Sample: _____

Collected by: _____	Date: _____	Time: _____
Relinquished by: _____	Date: _____	Time: _____
Received by: _____	Date: _____	Time: _____

SELENIUM FISH TISSUE CHAIN-OF-CUSTODY

Station #: LHL #4 PS 2 **Date:** 10/3

Stream / Location: _____ **Time:** _____

KPDES Permit#: SC1711301

County: _____ **Lat/Long Upstream Reach:** _____

Lat/Long Downstream Reach: _____

Outfall #: _____ **Duplicate/Replicate (circle one):** yes no

Flow status (circle one): runoff event high flow low flow normal other

cont from PS 1

Fish #	Genus	Species	Length (mm)	Comments
S2 ~~001~~ 008	Bluegill		148 / 48.4	
S1 ~~002~~ 001	KY Bass		287 / 300.2	Male
S1 ~~003~~ 002	KY Bass		310 / 375 qr	F ovary = 3.4 qr
S2 ~~004~~ 003	LM Bass		311 / 400 qr	F ovary = 2.7 qr
~~005~~ 004 XTRA	KY Bass		258 / 200.6	
~~006~~ 005 XTR	KY Bass		248 / 190.5	
~~007~~				

Length (mm) of 75%tile of Longest Fish: _____

Total # Fish Collected in Sample: _____

Collected by: _____	Date: _____	Time: _____
Relinquished by: _____	Date: _____	Time: _____
Received by: _____	Date: _____	Time: _____

SELENIUM FISH TISSUE CHAIN-OF-CUSTODY

Station #: LHL4 P83 **Date:** 10/4

Stream / Location: _____ **Time:** _____

KPDES Permit#: _____

County: _____ **Lat/Long Upstream Reach:** _____

Lat/Long Downstream Reach: _____

Outfall #: _____ **Duplicate/Replicate (circle one): yes no**

Flow status (circle one): runoff event high flow low flow normal other

LPS

Fish #	Genus	Species	Length (mm)	Comments
001 SL	LMB		320 400	
002				
003				
004				
005				
006				
007				

Length (mm) of 75%tile of Longest Fish: _____

Total # Fish Collected in Sample: _____

Collected by: _____	Date: _____	Time: _____
Relinquished by: _____	Date: _____	Time: _____
Received by: _____	Date: _____	Time: _____

SELENIUM FISH TISSUE CHAIN-OF-CUSTODY

Station #: LHL-4 **Date:** Oct 12, 2017

Stream / Location: _____ **Time:** _____

KPDES Permit#: _____

County: _____ **Lat/Long Upstream Reach:** _____

Lat/Long Downstream Reach: _____

Outfall #: _____ **Duplicate/Replicate (circle one): yes no**

Flow status (circle one): runoff event high flow low flow normal other

Fish #	Genus	Species	Length (mm)	Comments
001	CC		2270g 515mm	
002	FHC		3008g 682mm	
003				
004				
005				
006				
007				

Length (mm) of 75%tile of Longest Fish: _____

Total # Fish Collected in Sample: _____

Collected by: _____	Date: _____	Time: _____
Relinquished by: _____	Date: _____	Time: _____
Received by: _____	Date: _____	Time: _____

SELENIUM FISH TISSUE CHAIN-OF-CUSTODY

Station #: LHL#5 P81 **Date:** 10/7/16

Stream / Location: [illegible] **Time:** _____

KPDES Permit#: SC1711501

County: _____ **Lat/Long Upstream Reach:** _____

Lat/Long Downstream Reach: _____

Outfall #: _____ **Duplicate/Replicate (circle one):** yes no

Flow status (circle one): runoff event high flow low flow normal other

Fish #	Genus	Species	Length (mm) / gr	Comments
S1 001	CHCF		802 / 4737	Fovary = 82 gr
S1 002	CHCatfish		645 / 2440	
S2 003	CHCF		522 / 1175	
S2 004	CHCF		520 / 1325	
S2 005	CHCF		570 / 1450	
006	Bluegill		172 / 90	
S1 007 cont P84	LMB		377 / 825	Fovary = 6.6 gr

Length (mm) of 75%tile of Longest Fish: _____

Total # Fish Collected in Sample: _____

Collected by: _____	Date: _____	Time: _____
Relinquished by: _____	Date: _____	Time: _____
Received by: _____	Date: _____	Time: _____

SELENIUM FISH TISSUE
CHAIN-OF-CUSTODY

Station #: LHL #5 R2 **Date:** 10/7

Stream / Location: _____ **Time:** _____

KPDES Permit#: _____

County: _____ **Lat/Long Upstream Reach:** _____

Lat/Long Downstream Reach: _____

Outfall #: _____ **Duplicate/Replicate (circle one):** yes no

Flow status (circle one): runoff event high flow low flow normal other

Fish #	Genus	Species	Length (mm)	Comments
S1 001 008	LMB		392/900	
S1 002 009	LMB		410/1050	
S2 003 010	LMB		398/900	
S3 004 011	LMB		378/800	
S4 005 012	LMB		390/850	
006				
007				

Length (mm) of 75%tile of Longest Fish: _____
Total # Fish Collected in Sample: _____

Collected by: _____	Date: _____	Time: _____
Relinquished by: _____	Date: _____	Time: _____
Received by: _____	Date: _____	Time: _____

SELENIUM FISH TISSUE CHAIN-OF-CUSTODY

Station #: LHL 5 **Date:** Oct 11, 2017

Stream / Location: _____ **Time:** _____

KPDES Permit#: _____

County: _____ **Lat/Long Upstream Reach:** _____

Lat/Long Downstream Reach: _____

Outfall #: _____ **Duplicate/Replicate (circle one):** yes no

Flow status (circle one): runoff event high flow low flow normal other

Fish #	Genus	Species	Length (mm)	Comments
~~001~~ 013	Bluegill		96.5g 177mm	
002 014	Bluegill		101.4g 186mm	
003 015	Bluegill		83.1g 167mm	
004 016	Bluegill		56.0g 158mm	
005 017	Bluegill		55.3g 155mm	
006 018	Bluegill		50.4g 148mm	
007 019	Bluegill		55.2g 152mm	

sample 1

sample 2

Length (mm) of 75%tile of Longest Fish: _____

Total # Fish Collected in Sample: _____

Collected by: _____	Date: _____	Time: _____
Relinquished by: _____	Date: _____	Time: _____
Received by: _____	Date: _____	Time: _____

SELENIUM FISH TISSUE CHAIN-OF-CUSTODY

Station #: LHL6 **Date:** 10/7/17

Stream / Location: _____ **Time:** _____

KPDES Permit#: SCP11301

County: _____ **Lat/Long Upstream Reach:** _____

Lat/Long Downstream Reach: _____

Outfall #: _____ **Duplicate/Replicate (circle one):** yes no

Flow status (circle one): runoff event high flow low flow normal other

Fish #	Genus	Species	Length (mm)	Comments
001	CH Catfish		710/4625	Forey=118 g
002	CH CF		500/1200	
003	KY Bass		333/475	Forey = 5.0g
004	Hybrid stripe		503/1825	M
005	Hybrid stripe		480/1650	Forey 13.5g
006	Hybrid stripe		495/1800	
007				

Length (mm) of 75%tile of Longest Fish: _____

Total # Fish Collected in Sample: _____

Collected by: _____	Date: _____	Time: _____
Relinquished by: _____	Date: _____	Time: _____
Received by: _____	Date: _____	Time: _____

SELENIUM FISH TISSUE CHAIN-OF-CUSTODY

Station #: LHLe **Date:** 10-11-17

Stream / Location: _____ **Time:** _____

KPDES Permit#: _____

County: _____ **Lat/Long Upstream Reach:** _____

Lat/Long Downstream Reach: _____

Outfall #: _____ **Duplicate/Replicate (circle one):** yes no

Flow status (circle one): runoff event high flow low flow normal other

Fish #	Genus	Species	Length (mm)	Comments
~~001~~ 007	BLUEGILL		76.6g 171mm	
~~002~~ 008	Bluegill		90.2g 180mm	
003 009	Bluegill		97.0g 173mm	
004 010	Bluegill		55g 148mm	
005 011	Bluegill		65.4g 167mm	
006 012	Bluegill		62.2g 161mm	
007 013	LMB		525g 334mm	

sample 1

Length (mm) of 75%tile of Longest Fish: _____

Total # Fish Collected in Sample: _____

Collected by: _____	Date: _____	Time: _____
Relinquished by: _____	Date: _____	Time: _____
Received by: _____	Date: _____	Time: _____

SELENIUM FISH TISSUE CHAIN-OF-CUSTODY

Station #: LHL6 **Date:** 10-11-2017

Stream / Location: _____ **Time:** _____

KPDES Permit#: _____

County: _____ **Lat/Long Upstream Reach:** _____

Lat/Long Downstream Reach: _____

Outfall #: _____ **Duplicate/Replicate (circle one): yes no**

Flow status (circle one): runoff event high flow low flow normal other

Fish #	Genus	Species	Length (mm)	Comments
~~001~~ 014	KY Bass		450g 324mm	
002 015	KY Bass		575g 325mm	
003				
004				
005				
006				
007				

Length (mm) of 75%tile of Longest Fish: _____

Total # Fish Collected in Sample: _____

Collected by: _____	Date: _____	Time: _____
Relinquished by: _____	Date: _____	Time: _____
Received by: _____	Date: _____	Time: _____

SELENIUM FISH TISSUE CHAIN-OF-CUSTODY

Station #: LHL6 **Date:** Oct 2, 2017

Stream / Location: _____ **Time:** _____

KPDES Permit#: _____

County: _____ **Lat/Long Upstream Reach:** _____

Lat/Long Downstream Reach: _____

Outfall #: _____ **Duplicate/Replicate (circle one): yes no**

Flow status (circle one): runoff event high flow low flow normal other

Fish #	Genus	Species	Length (mm)	Comments
~~001~~ 016	LMB		1050g 442mm	
002 017	CC		550g 424mm	
~~003~~				
~~004~~				
005				
~~006~~				
~~007~~				

Length (mm) of 75%tile of Longest Fish: _____

Total # Fish Collected in Sample: _____

Collected by: _____	Date: _____	Time: _____
Relinquished by: _____	Date: _____	Time: _____
Received by: _____	Date: _____	Time: _____

SELENIUM FISH TISSUE CHAIN-OF-CUSTODY

Station #: LHL 6 **Date:** Oct 13, 2016

Stream / Location: _____ **Time:** _____

KPDES Permit#: _____

County: _____ **Lat/Long Upstream Reach:** _____

Lat/Long Downstream Reach: _____

Outfall #: _____ **Duplicate/Replicate (circle one): yes no**

Flow status (circle one): runoff event high flow low flow normal other

Fish #	Genus	Species	Length (mm)	Comments
~~001~~ 018	CC		1925 g 603mm	
002				
003				
004				
005				
006				
007				

Length (mm) of 75%tile of Longest Fish: _____

Total # Fish Collected in Sample: _____

Collected by: _____	Date: _____	Time: _____
Relinquished by: _____	Date: _____	Time: _____
Received by: _____	Date: _____	Time: _____

SELENIUM FISH TISSUE CHAIN-OF-CUSTODY

Station #: MHL-3 **Date:** Oct 14, 2017

Stream / Location: Herrington Lake **Time:** 1730

KPDES Permit#: _____

County: _____ **Lat/Long Upstream Reach:** _____

Lat/Long Downstream Reach: _____

Outfall #: _____ **Duplicate/Replicate (circle one):** yes no

Flow status (circle one): runoff event high flow low flow (normal) other

Fish #	Genus	Species	Length (mm)	Comments
001	Sample 1 of 2	BG	146 mm	48.9g
002		BG	153 mm	57.7g
003		BG	152 mm	62.4g
004		BG	145 mm	47.8g
005	Sample 2 of 2	BG	138 mm	42.0g
006		BG	145 mm	49.3g
007		BG	141 mm	44.1g

Length (mm) of 75%tile of Longest Fish: _____

Total # Fish Collected in Sample: _____

Collected by: _____	Date: _____	Time: _____
Relinquished by: _____	Date: _____	Time: _____
Received by: _____	Date: _____	Time: _____

SELENIUM FISH TISSUE
CHAIN-OF-CUSTODY

Station #: MHL3 **Date:** 10/14/17

Stream / Location: Herrington Lake **Time:** 1730

KPDES Permit#: _____

County: _____ **Lat/Long Upstream Reach:** _____

Lat/Long Downstream Reach: _____

Outfall #: _____ **Duplicate/Replicate (circle one): yes no**

Flow status (circle one): runoff event high flow low flow (normal) other

Fish #	Genus	Species	Length (mm)	wt (g) Comments
0018	Sample 1 of 2	CC	505mm	1150g, ovary= 26.1g
0029		CC	540mm	1250g
0010	Sample 2 of 2	CC	454mm	775g
0011		CC	474mm	875g
0012	Sample 1 of 2	LMB	470mm	1550g, ovary= 12.3g
0013		LMB	385mm	900g
0014	Sample 2 of 2	LMB	385mm	900g

1/3

This is correct!

Length (mm) of 75%tile of Longest Fish: _____

Total # Fish Collected in Sample: _____

Collected by: _____	Date: _____	Time: _____
Relinquished by: _____	Date: _____	Time: _____
Received by: _____	Date: _____	Time: _____

SELENIUM FISH TISSUE
CHAIN-OF-CUSTODY

Station #: MHL 3 **Date:** 10/14/19

Stream / Location: Hennington Lake **Time:** 1730

KPDES Permit#: _____

County: _____ **Lat/Long Upstream Reach:** _____

Lat/Long Downstream Reach: _____

Outfall #: _____ **Duplicate/Replicate (circle one): yes no**

Flow status (circle one): runoff event high flow low flow normal other

Fish #	Genus	Species	Length (mm)	Comments
0015	Sample	LMB	364 mm	800g
00716	2 of 2 (2/35)	LMB	345mm	600g
0017				
0018				
0019				
0020				
007				

Length (mm) of 75%tile of Longest Fish: _____
Total # Fish Collected in Sample: _____

Collected by: _____	Date: _____	Time: _____
Relinquished by: _____	Date: _____	Time: _____
Received by: _____	Date: _____	Time: _____

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SELENIUM FISH TISSUE
CHAIN-OF-CUSTODY

Station #: MHL-1 **Date:** Oct 14th, 2017

Stream / Location: Herrington Lake **Time:** 1630

KPDES Permit#: _____

County: _____ **Lat/Long Upstream Reach:** _____

Lat/Long Downstream Reach: _____

Outfall #: _____ **Duplicate/Replicate (circle one): yes no**

Flow status (circle one): runoff event high flow low flow normal other

Fish #	Genus (Sample 1 of 2)	Species	Length (mm)	wt(g) Comments
001	[redacted]	LMB	366mm	750g, male
002	Sample 1 of 1	KYB	334 mm	475g, ovary = 4.26g
003		KYB	350 mm	525g,
004	Sample 1 of 2	FC	511 mm	1350g, ovaries 11.5g
005		FC	460 mm	1300g
006	Sample 2 of 2	FC	620 mm	2865g
007		FC	865 mm	8913g.

Length (mm) of 75%tile of Longest Fish: _____
Total # Fish Collected in Sample: _____

Collected by: _____	Date: _____	Time: _____
Relinquished by: _____	Date: _____	Time: _____
Received by: _____	Date: _____	Time: _____

SELENIUM FISH TISSUE CHAIN-OF-CUSTODY

Station #: MHL-1 **Date:** Oct, 14th, 2017

Stream / Location: Herrington Lake **Time:** 1630

KPDES Permit#: _____

County: _____ **Lat/Long Upstream Reach:** _____

Lat/Long Downstream Reach: _____

Outfall #: _____ **Duplicate/Replicate (circle one): yes no**

Flow status (circle one): runoff event high flow low flow normal other

Fish #	Genus	Species	Length (mm)	wt(g) Comments
001 8	½ of Sample 1 of 2	BG	160 mm	58,5g
002				
003				
004				
005				
006				
007				

Length (mm) of 75%tile of Longest Fish: _____

Total # Fish Collected in Sample: _____

Collected by: _____	Date: _____	Time: _____
Relinquished by: _____	Date: _____	Time: _____
Received by: _____	Date: _____	Time: _____

SELENIUM FISH TISSUE CHAIN-OF-CUSTODY

Station #: MHL-1 **Date:** Oct 15th, 2017

Stream / Location: Herrington Lake **Time:** 1200 pm

KPDES Permit#: _____

County: _____ **Lat/Long Upstream Reach:** _____

Lat/Long Downstream Reach: _____

Outfall #: _____ **Duplicate/Replicate (circle one): yes no**

Flow status (circle one): runoff event high flow low flow (normal) other

Fish #	Genus	Species	Length (mm)	Comments
0016	Sample 2 of 2	BG	147 mm	51.5 g
0017		BG	147 mm	52.6 g
0018		BG	147 mm	49.1 g
004				
005				
006				
007				

Length (mm) of 75%tile of Longest Fish: _____

Total # Fish Collected in Sample: _____

Collected by: _____	Date: _____	Time: _____
Relinquished by: _____	Date: _____	Time: _____
Received by: _____	Date: _____	Time: _____

SELENIUM FISH TISSUE CHAIN-OF-CUSTODY

Station #: MHL-1 **Date:** Oct 15th, 2017

Stream / Location: Herrington Lake **Time:** 1200 pm

KPDES Permit#: _____

County: _____ **Lat/Long Upstream Reach:** _____

Lat/Long Downstream Reach: _____

Outfall #: _____ **Duplicate/Replicate (circle one):** yes no

Flow status (circle one): runoff event high flow low flow (normal) other

Fish #	Genus	Species	Length (mm)	Comments
009	Sample 1 of 1	LMB	365 mm	625 g
010	Sample 2 of 2	LMB	347 mm	550 g
011		LMB	345 mm	525 g
012		BG	161 mm	55.6 g
013	Sample 1 of 2	BG	165 mm	73.7 g
014		BG	172 mm	83.5 g
015	Sample 2 of 2	BG	152 mm	51.7 g

Length (mm) of 75%tile of Longest Fish: _____

Total # Fish Collected in Sample: _____

Collected by: _____	Date: _____	Time: _____
Relinquished by: _____	Date: _____	Time: _____
Received by: _____	Date: _____	Time: _____

SELENIUM FISH TISSUE CHAIN-OF-CUSTODY

DR1

Station #: Dix River (Below Dam) **Date:** 10-16-17

Stream / Location: _____ **Time:** 1630

KPDES Permit#: _____

County: _____ **Lat/Long Upstream Reach:** _____

Lat/Long Downstream Reach: _____

Outfall #: _____ **Duplicate/Replicate (circle one):** yes no

Flow status (circle one): runoff event high flow low flow normal other

Fish #	Genus	Species	Length (mm)	Comments
001	Green Sunfish	(GSF)	159 mm,	81.2 g AS
002 Sample 1 of 2	"	(GSF)	132 mm	39.8 g
003	"		119 mm	24.5 g
004	"		105 mm	21.6 g
005 Sample 2 of 2	"		94 mm	14.5 g
006	"		96 mm	14.1 g
007	"		92 mm	12.1 g

(GSF) Sample 1 N = 3 , Sample 2, N = 8

Length (mm) of 75%tile of Longest Fish: _____

Total # Fish Collected in Sample: _____

Collected by: _____	Date: _____	Time: _____
Relinquished by: _____	Date: _____	Time: _____
Received by: _____	Date: _____	Time: _____

SELENIUM FISH TISSUE
CHAIN-OF-CUSTODY

Station #: DR1 Dix River **Date:** 10-16-17

Stream / Location: G Below Dam **Time:** 1630

KPDES Permit#: _____

County: _____ **Lat/Long Upstream Reach:** _____

Lat/Long Downstream Reach: _____

Outfall #: _____ **Duplicate/Replicate (circle one): yes no**

Flow status (circle one): runoff event high flow low flow normal other

Fish #	Genus	Species	Length (mm)	Comments
0018	Green Sunfish	(GSF)	96 mm	14.2g
0019 Sample 2 Cont'd	"	"	87 mm	11.9g
0020	"	"	92 mm	10.3g
0021	"	"	79 mm	8.0g
0022 Sample 1 of 2	Bluegill	BG	134 mm	32.5g
0023	"	"	112 mm	24.8g
0024	Longear Sunfish	LE	109 mm	26.1g

Length (mm) of 75%tile of Longest Fish: _____
Total # Fish Collected in Sample: _____

Collected by: _____	Date: _____	Time: _____
Relinquished by: _____	Date: _____	Time: _____
Received by: _____	Date: _____	Time: _____

SELENIUM FISH TISSUE CHAIN-OF-CUSTODY

Station #: DR1 **Date:** 10/18/17

Stream / Location: Dix River (Below Dam) **Time:** 1830

KPDES Permit#: _____

County: _____ **Lat/Long Upstream Reach:** _____

Lat/Long Downstream Reach: _____

Outfall #: _____ **Duplicate/Replicate (circle one):** yes no

Flow status (circle one): runoff event (high flow) low flow normal other

Fish #	Genus	Species	Length (mm)	Comments
001 15	Largemouth Bass	LMB	341mm	500g, Ovary = 7.8g
002 16	Brown trout	BT	310mm	252g Ovary = 35.6g Gravid
003 17	Spotted Sucker	SS	256mm	160g
004 18	"	"	207mm	87g
005 19	"	SS	350mm	500g
006 20	Hogsucker	HS	287mm	285g, 9.9Zg
007 21	"	HS	259mm	205g

All males

Sample

Length (mm) of 75%tile of Longest Fish: _____

Total # Fish Collected in Sample: _____

Collected by: _____	Date: _____	Time: _____
Relinquished by: _____	Date: _____	Time: _____
Received by: _____	Date: _____	Time: _____

APPENDIX D: SAMPLE COLLECTION FIELD DATA SHEETS

Appendix D2: Lake Profiling and Surface Water Collection Data Sheets

RAMBOLL ENVIRON

Herrington Lake Surface Water Quality and Dissolved Oxygen Profile Data Collection Sheet

Herrington Lake Transect Location	CI-1
GPS Coordinates (or where they can be found if collected electronically)	CURDS INLET
Investigators: BG, KL	Date: 10-14-17 / Time: 10:06
Temperature/Depth/Oxygen Probe Used	
Probe Calibration Date 10-14-17	
Secchi Disk Depth 6.5	

Depth (feet)	DO (mg/L)	Cond.	Temp (oC or oF)	PH	Stratification Layer (if known)	Was Surface Water Collected? (Y,N)	Sample ID (if collected)	Observer Notes, if any
5	4.03	0.382	21.83	7.40	MOVE	Y		SW-001(5)-CI-171014

Notes

DO	Dissolved oxygen
Temp	Temperature
°C	Degrees Celcius
°F	Degrees Fahrenheit
mg/L	milligrams per liter
Y/N	Yes or No

RAMBOLL ENVIRON

Herrington Lake Surface Water Quality and Dissolved Oxygen Profile Data Collection Sheet

Herrington Lake Transect Location	CI-2	
GPS Coordinates (or where they can be found if collected electronically)	CURDS INLET	
Investigators: BG, KL		Date: 10-14-17 Time: 1045
Temperature/Depth/Oxygen Probe Used		
Probe Calibration Date 10-14-17		
Secchi Disk Depth 6ft		

Depth (feet)	DO (mg/L)	Cond.	Temp (oC or oF)	PH	Stratification Layer (if known)	Was Surface Water Collected? (Y,N)	Sample ID (if collected)	Observer Notes, if any
10	4.38	0.365	21.76	7.98	NONE	Y		SW-001(10)-CI2-171014

Notes

DO	Dissolved oxygen
Temp	Temperature
°C	Degrees Celcius
°F	Degrees Fahrenheit
mg/L	milligrams per liter
Y/N	Yes or No

RAMBOLL ENVIRON

Herrington Lake Surface Water Quality and Dissolved Oxygen Profile Data Collection Sheet

Herrington Lake Transect Location	~~DUPE~~ CI-3	
GPS Coordinates (or where they can be found if collected electronically)	CURDS INLET	
Investigators: BG, KL		Date: 10-14-17 Time: 11:15
Temperature/Depth/Oxygen Probe Used		
Probe Calibration Date 10-14-17		
Secchi Disk Depth 6ft		

Depth (feet)	DO (mg/L)	Cond.	Temp (oC or oF)	pH	Stratification Layer (if known)	Was Surface Water Collected? (Y,N)	Sample ID (if collected)	Observer Notes, if any
10	4.49	0.348	21.79	8.14	NONE	Y		SW-001(10)-CI3-171014

Notes

DO	Dissolved oxygen
Temp	Temperature
°C	Degrees Celcius
°F	Degrees Fahrenheit
mg/L	milligrams per liter
Y/N	Yes or No

RAMBOLL ENVIRON

Herrington Lake Surface Water Quality and Dissolved Oxygen Profile Data Collection Sheet

Herrington Lake Transect Location	CI4	
GPS Coordinates (or where they can be found if collected electronically)		CURDS INLET
Investigators: BG, KL		Date: 10-14-17 Time: 1215
Temperature/Depth/Oxygen Probe Used		
Probe Calibration Date 10-14-17		
Secchi Disk Depth 7ft		

Depth (feet)	DO (mg/L)	Cond.	Temp (oC or oF) C	PH	Stratification Layer (if known)	Was Surface Water Collected? (Y,N)	Sample ID (if collected)	Observer Notes, if any
20	3.50	0.339	21.74	8.11	NONE	Y		SW-002(20)-CI4-171014
70	1.28	0.300	20.10	7.82	NONE	Y		SW-001(70)-CI4-171014

Notes

DO	Dissolved oxygen
Temp	Temperature
°C	Degrees Celcius
°F	Degrees Fahrenheit
mg/L	milligrams per liter
Y/N	Yes or No

RAMBOLL ENVIRON

Herrington Lake Surface Water Quality and Dissolved Oxygen Profile Data Collection Sheet

Herrington Lake Transect Location	HQ-1		
GPS Coordinates (or where they can be found if collected electronically)	Trimble Yuma	HQ Inlet	
Investigators:		Date:	Oct 3, 2017
		Time:	1535
Temperature/Depth/Oxygen Probe Used		45I 650 MDS	
Probe Calibration Date	Oct 3, 2017	WATER DEPTH 16 ft	
Secchi Disk Depth	5 ft		

45I Depth (feet)	DO (mg/L)	Cond.	Temp (oC or oF)	PH	Stratification Layer (if known)	Was Surface Water Collected? (Y,N)	SAMPLE ~~Sample ID (if collected)~~ DEPTH	SAMPLE ID ~~Observer Notes, if any~~
10	3.33	0.368	22.33	8.24	NONE	Y(10/4)	10 ft	SW001(10)-HQ1- 171004

Notes

DO	Dissolved oxygen
Temp	Temperature
°C	Degrees Celcius
°F	Degrees Fahrenheit
mg/L	milligrams per liter
Y/N	Yes or No

RAMBOLL ENVIRON

Herrington Lake Surface Water Quality and Dissolved Oxygen Profile Data Collection Sheet

Herrington Lake Transect Location	HI-1	
GPS Coordinates (or where they can be found if collected electronically)	Trimble Yuma	Hardins Inlet
Investigators:	A Smith, B. Gorby	Date: Oct 3, 2017 Time: 1556
Temperature/Depth/Oxygen Probe Used		YSI 650 MDS
Probe Calibration Date	Oct 3, 2017	WATER ~~TEM~~ DEPTH: 18 ft
Secchi Disk Depth	6 ft	

YSI Depth (feet)	DO (mg/L)	Cond.	Temp (oC or oF)	PH	Stratification Layer (if known)	Was Surface Water Collected? (Y,N)	SAMPLE ~~Sample ID~~ ~~(if collected)~~ DEPTH	SAMPLE ID ~~Observer Notes, if any~~
10	7.75	0.307	22.18	8.37	NONE	Y (10/5)	10 FT	SW-001(10)HT~~1~~-171005

Notes
- DO Dissolved oxygen
- Temp Temperature
- °C Degrees Celcius
- °F Degrees Fahrenheit
- mg/L milligrams per liter
- Y/N Yes or No

RAMBOLL ENVIRON

Herrington Lake Surface Water Quality and Dissolved Oxygen Profile Data Collection Sheet

Herrington Lake Transect Location	LHL-1 (one)
GPS Coordinates (or where they can be found if collected electronically) Trimble Yuma	Rocky Fork / Rock Run
Investigators: A. Smith, B. Gaibe	Date: Oct. 6 2017 Time: 16:00
Temperature/Depth/Oxygen Probe Used	YSI 650 MDS
Probe Calibration Date Oct. 6, 2017	
Secchi Disk Depth 6ft	Water Depth: 75 ft - 110 ft

Depth (feet)	DO (mg/L)	Cond	Temp (oC or oF)	pH	Stratification Layer (if known)	Was Surface Water Collected? (Y,N)	SAMPLE ~~Sample ID (if collected)~~ Depth	SAMPLE ~~Observer Notes, if any~~ I.D.
20	2.85	0.314	22.1	8.07	Epilimnion	Y	20ft	SW-001(20ft) LHL1 - 171006
60	0.70	0.292	19.23	7.74	Lake Bottom	Y	60ft	SW-002(60) LHL1 - 171006

Notes

DO	Dissolved oxygen
Temp	Temperature
°C	Degrees Celcius
°F	Degrees Fahrenheit
mg/L	milligrams per liter
Y/N	Yes or No

RAMBOLL ENVIRON

Herrington Lake Surface Water Quality and Dissolved Oxygen Profile Data Collection Sheet

Herrington Lake Transect Location	CHL-2	(Two)
GPS Coordinates (or where they can be found if collected electronically)	Trimble Yuma	Dix Dam
Investigators:	A. Smith, R. Garbe	Date: Oct 6, 2017 Time: 1126 AM
Temperature/Depth/Oxygen Probe Used		YSI 550 MDS
Probe Calibration Date	Oct 6, 2017	
Secchi Disk Depth	8 FT	WATER DEPTH: 195 FT

Depth (feet)	DO (mg/L)	Cond.	Temp (oC or oF)	PH	Stratification Layer (if known)	Was Surface Water Collected? (Y,N)	SAMPLE Sample ID (if collected) DEPTH	SAMPLE Observer Notes, if any
10	5.65	0.313	22.47	8.56				
20	4.11	0.313	22.04	7.96	Epilimnion	y	25 FT	SW-001(25)CHL2 - 171006
30	3.55	0.314	21.44	7.92				
40	2.32	0.333	21.63	7.56				
50	1.94	0.245	20.24	7.6	Top of Thermocline	y	50 FT	SW-002(50)CHL2 - 171006
60	3.04	0.283	19.44	7.6				
70	1.77	0.274	17.71	7.47				
80	1.72	0.272	15.76	7.47				
90	1.63	0.262	14.16	7.47				
100	1.65	0.245	12.82	7.46	Hypolimnion	y	100 FT	SW-003(100)CHL2 - 171006
110	1.63	0.24	12.06	7.48				
120	1.40	0.249	11.35	7.5				
130	2.84	0.24	10.63	7.56				
140	2.93	0.23	9.81	7.62				
150	2.57	0.228	9.5	7.67				
160	1.85	0.226	9.09	7.76				

Notes

DO	Dissolved oxygen
Temp	Temperature
°C	Degrees Celcius
°F	Degrees Fahrenheit
mg/L	milligrams per liter
Y/N	Yes or No

RAMBOLL ENVIRON

Herrington Lake Surface Water Quality and Dissolved Oxygen Profile Data Collection Sheet

Herrington Lake Transect Location	LHL-3
GPS Coordinates (or where they can be found if collected electronically) Trimble Yuma	LHL3 - Mile Marker 1 (One)
Investigators: A Smith, B Garbe	Date: Oct. 6 2017 Time: 17:00
Temperature/Depth/Oxygen Probe Used	YSI 650 MDS
Probe Calibration Date Oct. 6 2017	
Secchi Disk Depth 8 ft	Water Depth: 160

Depth (feet)	DO (mg/L)	Cond.	Temp (oC or oF)	PH	Stratification Layer (if known)	Was Surface Water Collected? (Y,N)	~~Sample ID~~ (if collected) Sample Depth	~~Observer Notes, if any~~ SAMPLE I.D.	
20	3.04	0.315	22.06	7.97	Epilimnion	Y	20 ft	SW-001(20)LHL3	-171006
70	0.67	0.276	17.57	7.74	Thermocline	Y	70 ft	SW-002(70)LHL3	-171006
100	0.68	0.248	13.28	7.48	Hypolimnion	Y	100 ft	SW-003(100)LHL3	-171006

Notes

DO	Dissolved oxygen
Temp	Temperature
°C	Degrees Celcius
°F	Degrees Fahrenheit
mg/L	milligrams per liter
Y/N	Yes or No

4

RAMBOLL ENVIRON

Herrington Lake Surface Water Quality and Dissolved Oxygen Profile Data Collection Sheet

Herrington Lake Transect Location	LHL-4	
GPS Coordinates (or where they can be found if collected electronically) See Trimble Unit		Mile 1 / Mile 2 Marker
Investigators: AJS, BG		Date: Oct 7, 2017 Time: 1500
Temperature/Depth/Oxygen Probe Used		YSI 550 MDS
Probe Calibration Date	Oct 7, 2017	
Secchi Disk Depth	7 ft	Water Depth: 160 ft

Depth (feet)	DO (mg/L)	Cond.	Temp (oC or oF)	pH	Stratification Layer (if known)	Was Surface Water Collected? (Y,N)	~~Sample~~ Depth	~~Sample~~ Observer Notes, if any ID	
20	8.63	NA	0.304	21.65 NA	7.95	Epilimnion	y	20	SW001(20)LHL4- 171007
70	7.83	↓	0.292	13.44 ↓	7.71	Metalimnion	y	70	SW002(70)LHL4- 171007
100	1.08	↓	0.243	13.34 ↓	8.00	Hypolimnion	y	100	SW003(100)LHL4- 171007

Notes

DO	Dissolved oxygen
Temp	Temperature
°C	Degrees Celcius
°F	Degrees Fahrenheit
mg/L	milligrams per liter
Y/N	Yes or No

RAMBOLL ENVIRON

Herrington Lake Surface Water Quality and Dissolved Oxygen Profile Data Collection Sheet

Herrington Lake Transect Location	LHL-5
GPS Coordinates (or where they can be found if collected electronically) See Trimble Yuma	NE of Mallard Cove / Cane Run
Investigators: A. Smith B. Garbe	Date: Oct. 7 2017 Time: 10:00
Temperature/Depth/Oxygen Probe Used	YSI 650 MDS
Probe Calibration Date Oct. 7 2017	
Secchi Disk Depth 8 ft	Water Depth: 158

YSI Depth (feet)	DO (mg/L)	Cond	Temp (oC or oF)	PH	Stratification Layer (if known)	Was Surface Water Collected? (Y,N)	Sample ~~ID (if collected)~~ Depth	Sample ~~Observer Notes, if any~~ I.D.	
20	3.95	0.304	21.45	7.73	epilimnion	Y	20 ft	SW001(20)LHL5	-171007
70	1.18	0.274	17.83	7.22	Metalimnion	Y	70 ft	SW002(70)LHL5	-171007
100	0.90	0.258	13.12	7.32	Hypolimnion	Y	100 ft	SW003(100)LHL5	-171007

Notes

DO	Dissolved oxygen
Temp	Temperature
°C	Degrees Celcius
°F	Degrees Fahrenheit
mg/L	milligrams per liter
Y/N	Yes or No

RAMBOLL ENVIRON

Herrington Lake Surface Water Quality and Dissolved Oxygen Profile Data Collection Sheet

Herrington Lake Transect Location	LHL-6	
GPS Coordinates (or where they can be found if collected electronically)	See Trimble Yuma	Mile 3 / Mile 4 Marker
Investigators:	AJS, BG	Date: Oct 7. 2017
		Time: 1300
Temperature/Depth/Oxygen Probe Used		NONE
Probe Calibration Date		WATER DEPTH: 130ft
Secchi Disk Depth	8 ft	

Sample Depth (feet)	DO (mg/L)	cond.	Temp (oC or oF)	pH	Stratification Layer (if known)	Was Surface Water Collected? (Y,N)	Sample ID (if collected)	Observer Notes, if any	
							Depth	IO	
20	9.56 N	0.281	21.6 NO	7.69	Epilimnion	Y	20	SW001(20)LHL6-	171007
70	2.46 ↓	0.270	18.37 ↓	7.57	Thermo	Y	70	SW002(70)LHL6-	171007
100	2.41 ↓	0.238	13.44 ↓	7.34	Hypolimnion	Y	100	SW003(100)LHL6-	171007

Notes

DO	Dissolved oxygen
Temp	Temperature
°C	Degrees Celcius
°F	Degrees Fahrenheit
mg/L	milligrams per liter
Y/N	Yes or No

RAMBOLL ENVIRON

Herrington Lake Surface Water Quality and Dissolved Oxygen Profile Data Collection Sheet

Herrington Lake Transect Location	DR-1	
GPS Coordinates (or where they can be found if collected electronically) See GPS		Dix River Below Dam
Investigators: KL, BB		Date: Oct 7, 2017
		Time: 1615
Temperature/Depth/Oxygen Probe Used		YSI 650 MDS
Probe Calibration Date Oct 7, 2017		
Secchi Disk Depth		

Depth (feet)	DO (mg/L)	Cond.	Temp (oC or oF)	pH	Stratification Layer (if known)	Was Surface Water Collected? (Y,N)	SAMPLE Sample ID (if collected) DEPTH	SAMPLE Observer Notes, if any ID
1	5.78	0.271	18.79	7.76	NONE	Y	1 FT	SW001(1)DR1 -171007

Notes

DO	Dissolved oxygen
Temp	Temperature
°C	Degrees Celcius
°F	Degrees Fahrenheit
mg/L	milligrams per liter
Y/N	Yes or No

RAMBOLL ENVIRON

Herrington Lake Surface Water Quality and Dissolved Oxygen Profile Data Collection Sheet

Herrington Lake Transect Location	CI3	
GPS Coordinates (or where they can be found if collected electronically)	See trimble Yuma	Curds Inlet CI-3
Investigators:		Date: Mon Dec 11th 2017 Time: 1315
Temperature/Depth/Oxygen Probe Used		YSI 650 MDS
Probe Calibration Date	12/8/17	Whitewater sample = 9 ft midway down
Secchi Disk Depth	5.5 ft	WATER DEPTH = 18 ft

YSI Depth ~~(feet)~~ ft	DO (mg/L)	mS/cm cond.	Temp (oC or oF)	pH	Stratification Layer (if known)	Was Surface Water Collected? (Y,N)	~~Sample ID (if collected)~~ depth	Sample ID ~~Observer Notes, if any~~
9	7.03	0.408	13.51	8.04	NONE	Y	9 ft	

Notes
DO Dissolved oxygen
Temp Temperature
°C Degrees Celcius
°F Degrees Fahrenheit
mg/L milligrams per liter
Y/N Yes or No

RAMBOLL ENVIRON

Herrington Lake Surface Water Quality and Dissolved Oxygen Profile Data Collection Sheet

Herrington Lake Transect Location	LHL2 (TW01)	
GPS Coordinates (or where they can be found if collected electronically)	See Trimble Yuma	LHL2 - Dix Dam
Investigators:	A. Smith, B. Gonze	**Date:** Dec 11, 2017
		Time: 915 AM
Temperature/Depth/Oxygen Probe Used	YSI 650 MDS	
Probe Calibration Date	Dec 6th, 2017 - Checked Dec 11, 2017	
Secchi Disk Depth	9 Ft	

A. Temp = 5°C (from YSI)

Winter Sampling @ 25 Ft

WATER DEPTH = 190 Ft

Depth (feet)	DO (mg/L)	mS/cm Cond.	Temp (°C or °F)	pH	Stratification Layer (if known)	Was Surface Water Collected? (Y,N)	Sample ID (if collected) Depth	Observer Notes, if any
10	5.34	0.341	13.12	7.86	NONE			
20	5.37	0.341	13.12	7.86		Y	25 FT	SW001(25)LHL2-171211
30	5.35	0.341	13.12	7.86				
40	5.34	0.341	13.12	7.86				
50	5.33	0.341	13.12	7.86				
60	5.32	0.341	13.12	7.86				
70	5.30	0.341	13.12	7.86				
80	5.29	0.341	13.12	7.86				
90	5.28	0.341	13.12	7.86				
100	5.26	0.341	13.12	7.85				
110	5.22	0.341	13.12	7.85				
120	5.14	0.341	13.11	7.84				
130	4.65	0.340	12.78	7.80				
140	2.24	0.339	12.42	7.62				
150	1.68	0.337	12.30	7.56				

Notes

DO	Dissolved oxygen
Temp	Temperature
°C	Degrees Celcius
°F	Degrees Fahrenheit
mg/L	milligrams per liter
Y/N	Yes or No

RAMBOLL ENVIRON

Herrington Lake Surface Water Quality and Dissolved Oxygen Profile Data Collection Sheet

Herrington Lake Transect Location	LHL1		
GPS Coordinates (or where they can be found if collected electronically)	See trimble	LHL1 - Rocky Run	
Investigators:	A Smith	B. Gorbe	**Date:** Mon Dec 11th, 2017
			Time: 1115 AM
Temperature/Depth/Oxygen Probe Used		YSI 650 MDS	
Probe Calibration Date	12/6/17	"	Winter Sample @ 25 ft
Secchi Disk Depth	8 ft		

YSI Depth ~~(feet)~~ ft	DO (mg/L)	mS/cm Cond	Temp (oC or oF)	pH	Stratification Layer (if known)	Was Surface Water Collected? (Y,N)	Sample ID ~~(if collected)~~	Sample ID ~~Observer Notes, if any~~
25ft	5.5	0.339	13.08	7.92	NONE	Y	Depth 25 ft	

Notes

DO	Dissolved oxygen
Temp	Temperature
°C	Degrees Celcius
°F	Degrees Fahrenheit
mg/L	milligrams per liter
Y/N	Yes or No

RAMBOLL ENVIRON

Herrington Lake Surface Water Quality and Dissolved Oxygen Profile Data Collection Sheet

Herrington Lake Transect Location	LHL3
GPS Coordinates (or where they can be found if collected electronically) See trimble Yuma	LHL3
Investigators: A Smith, B. Gerbe	**Date:** Tues Dec 12th 2017 **Time:** 12 45 PM
Temperature/Depth/Oxygen Probe Used	USI 650 MDS
Probe Calibration Date 12/6/17 Checked 12/11/17	WATER DEPTH = 225 Ft
Secchi Disk Depth : 9 ft	

Winter SW Sample @ 25 Ft

Depth (feet)	DO (mg/L)	Cond. (mS/cm)	Temp (oC or oF)	pH	Stratification Layer (if known)	Was Surface Water Collected? (Y,N)	Sample ID (if collected) Depth ft	Observer Notes, If any Sample ID
90	5.43	0.340	13.03	7.91	NONE			
70	5.41	0.340	13.03	7.91	"			
50	5.40	0.340	13.02	7.90	"			
20	5.42	0.340	13.03	7.90	"	Y	25 Ft	SW001(25)-LHL3-171212

Notes

DO	Dissolved oxygen
Temp	Temperature
°C	Degrees Celcius
°F	Degrees Fahrenheit
mg/L	milligrams per liter
Y/N	Yes or No

RAMBOLL ENVIRON

Herrington Lake Surface Water Quality and Dissolved Oxygen Profile Data Collection Sheet

Herrington Lake Transect Location	LHL 6	
GPS Coordinates (or where they can be found if collected electronically) See trimble Yuma		LHL 6
Investigators: A. Smith, B. Garbe	Date: Tues, Dec 12th, 2017	Time: 12:00
Temperature/Depth/Oxygen Probe Used	YSI 650 MDS	
Probe Calibration Date 12/6/17 - Checked 12/11/17	WATER DEPTH = 200 ft	
Secchi Disk Depth 7 ft	Whitewater sample @ 25 ft	

Depth (feet)	DO (mg/L)	mS/cm Cond.	Temp (oC or oF)	pH	Stratification Layer (if known)	Was Surface Water Collected? (Y,N)	Sample ID ~~(if collected)~~ Depth ft	Sample ~~Observer Notes, if any~~ ID
90	4.98	0.329	13.08	7.87	NONE			
70	5.00	0.329	13.18	7.87	"			
50	5.05	0.330	13.08	7.87	"			
20	5.05	0.330	13.08	7.87	"	Y	25 ft	SW001(25)LHL6-171212

Notes

DO	Dissolved oxygen
Temp	Temperature
°C	Degrees Celcius
°F	Degrees Fahrenheit
mg/L	milligrams per liter
Y/N	Yes or No

APPENDIX D: SAMPLE COLLECTION FIELD DATA SHEETS

Appendix D3: Aquatic Vegetation Field Data Sheets

MTS

~~WATER QUALITY AND~~ VEGETATION FIELD DATA SHEET FOR HERRINGTON LAKE

See CI-1 coordinates

STREAM NAME CI-1	LOCATION Curds Inlet
STATION # _____ RIVERMILE _____	STREAM CLASS NA
LAT GPS LONG GPS	RIVER BASIN Herrington Lake
STORET # AV	AGENCY
INVESTIGATORS	
FORM COMPLETED BY M. Sorensen	DATE 10/4/17 TIME ~~11:50~~ 11:30 AM ~~PM~~
	REASON FOR SURVEY CAP

WEATHER CONDITIONS

Sunny

Now		Past 24 hours
☐	storm (heavy rain)	☐
☐	rain (steady rain)	☐
☐	showers (intermittent)	☐
0% ☐	%cloud cover	☐ 25%
☑	clear/sunny	☑

Has there been a heavy rain in the last 7 days? ☐ Yes ☑ No

Air Temperature ____ °C 70's F

Other _____

SITE LOCATION/MAP

CI-1

AV-001-CI-1-171004

1130 MTS

Draw a map of the site and indicate the areas sampled (or attach a photograph)

See CAP

Vegetation ID

AV-001-CI-171004

Sample collected along ~~wadeable~~ MTS wadeable shoreline. Periphyton abundant on rocks and duckweed abundant in water

Collected by wading and kayak

~~STREAM CHARACTERIZATION~~

Vegetation Sample weight

Stream Subsystem MTS ☐ ~~Perennial~~ ☐ ~~Intermittent~~ ☑ ~~Tidal~~

Stream Type ☐ ~~Coldwater~~ ☐ ~~Warmwater~~

Stream Origin

☐ ~~Glacial~~
☐ Non-glacial montane
☐ Swamp and bog
☐ Spring-fed
☐ Mixture of origins
☐ Other _____

Catchment Area _____ km²

weight: 240.71g

CI-1 (Pg 1 of 2)

Source: Rapid Bioassessment Protocols For Use in Streams and Wadeable Rivers: Periphyton, Benthic Macroinvertebrates, and Fish, Second Edition - Form 1

~~WATER QUALITY AND~~ VEGETATION FIELD DATA SHEET

MTS

CI-1

WATERSHED FEATURES See CAP Maps	**Predominant Surrounding Landuse** ☐ Forest ☐ Commercial ☐ Field/Pasture ☐ Industrial ☐ Agricultural ☐ Other _____ ☐ Residential Adjacent EWB row crop **Local Watershed NPS Pollution** ☐ No evidence ☐ Some potential sources ☐ Obvious sources **Local Watershed Erosion** ☐ None ☐ Moderate ☐ Heavy
RIPARIAN VEGETATION (18 meter buffer)	**Indicate the dominant type and record the dominant species present** ☐ Trees ☑ Shrubs ☐ Grasses ☑ Herbaceous **dominant species present** _____
INSTREAM FEATURES See CAP Maps	**Estimated Reach Length** _____m **Estimated Stream Width** _____m **Sampling Reach Area** _____m^2 **Area in km^2 (m^2x1000)** _____km^2 **Estimated Stream Depth** _____m **Surface Velocity (at thalweg)** _____m/sec **Canopy Cover** ☐ Partly open ☐ Partly shaded ☐ Shaded **High Water Mark** _____m **Proportion of Reach Represented by Stream Morphology Types** ☐ Riffle _____% ☐ Run _____% ☐ Pool _____% **Channelized** ☐ Yes ☐ No **Dam Present** ☐ Yes ☐ No
LARGE WOODY DEBRIS	**LWD** _____m^2 Qualitative - LWD prevalent **Density of LWD** _____m^2/km^2 **(LWD/ reach area)**
AQUATIC VEGETATION	**Indicate the dominant type and record the dominant species present** ☐ Rooted emergent ☐ Rooted submergent ☐ Rooted floating ☑ Free floating ☑ Floating Algae ☐ Attached Algae **dominant species present** periphyton duckweed some sedge **Portion of the reach with aquatic vegetation** ____% (~80% periphyton)
WATER QUALITY See Water Quality Sheet Logger	**Temperature** _____° C **Specific Conductance** _____ **Dissolved Oxygen** _____ **pH** _____ **Turbidity** _____ **WQ Instrument Used** _____ slightly turbid at outfall mixing **Water Odors** ☑ Normal/None ☐ Sewage ☐ Petroleum ☐ Chemical ☐ Fishy ☐ Other _____ **Water Surface Oils** ☐ Slick ☐ Sheen ☐ Globs ☐ Flecks ☑ None ☐ Other _____ **Turbidity (if not measured)** ☑ Clear ☐ Slightly turbid ☐ Turbid ☐ Opaque ☐ Stained ☐ Other _____
SEDIMENT/ SUBSTRATE	**Odors** ☑ Normal ☐ Sewage ☐ Petroleum ☐ Chemical ☐ Anaerobic ☐ None ☐ Other _____ **Oils** ☑ Absent ☐ Slight ☐ Moderate ☐ Profuse **Deposits** ☐ Sludge ☐ Sawdust ☐ Paper fiber ☐ Sand ☐ Relict shells ☐ Other _____ **Looking at stones which are not deeply embedded, are the undersides black in color?** ☑ Yes ☐ No NMS

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)			ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)		
Substrate Type	**Diameter**	**% Composition in Sampling Reach**	**Substrate Type**	**Characteristic**	**% Composition in Sampling Area**
Bedrock		✓	Detritus	sticks, wood, coarse plant materials (CPOM)	
Boulder	> 256 mm (10")	✓			
Cobble	64-256 mm (2.5"-10")	✓	Muck-Mud	black, very fine organic (FPOM)	
Gravel	2-64 mm (0.1"-2.5")	✓			
Sand	0.06-2mm (gritty)	✓	Marl	grey, shell fragments	
Silt	0.004-0.06 mm	✓			
Clay	< 0.004 mm (slick)	✓ MTS			

CI-1 (Pg 2 of 2)

Source: Appendix A-1: Habitat Assessment and Physicochemical Characterization Field Data Sheets - Form 1

~~WATER QUALITY AND~~ VEGETATION FIELD DATA SHEET FOR HERRINGTON LAKE

LAKE MTS

~~STREAM~~ NAME HERRINGTON	LOCATION CI-2 Curds Inlet
STATION #____ RIVERMILE____	STREAM CLASS
LAT See GPS LONG See GPS	RIVER BASIN
STORET #	AGENCY KU, Ramboll Environ
INVESTIGATORS KL, H.T	
FORM COMPLETED BY AJS / MTS	DATE Oct 5, 2017 TIME 345 AM (PM) — REASON FOR SURVEY CAP

WEATHER CONDITIONS

Now		Past 24 hours
☐	storm (heavy rain)	☐
☐	rain (steady rain)	☐
☐	showers (intermittent)	☐
__%☐	%cloud cover	☐ __%
☒	clear/sunny	☒

Has there been a heavy rain in the last 7 days? ☐ Yes ☒ No

Air Temperature 24 °C

Other________

SITE LOCATION/MAP

CI-2

Draw a map of the site and indicate the areas sampled (or attach a photograph)

See CAP

AV001 ~~(0.5-2.0)~~ -CI2-171005

Vegetation ID MTS

AV-001-CI2-171005

Sample collected along wadeable shoreline at depths ~0-2 ft.

~~STREAM~~ ~~CHARACTERIZATION~~ Vegetation sample weight

Stream Subsystem
~~☐ Perennial ☐ Intermittent ☐ Tidal~~

Stream Type
~~☐ Coldwater ☐ Warmwater~~

Stream Origin
~~☐ Glacial ☐ Non-glacial montane ☐ Swamp and bog ☐ Spring-fed ☐ Mixture of origins ☐ Other____~~

Catchment Area_____ km^2

Weight = 37.2 g

CI-2 (Page 1 of 2)

Source: Rapid Bioassessment Protocols For Use in Streams and Wadeable Rivers: Periphyton, Benthic Macroinvertebrates, and Fish, Second Edition - Form 1

~~WATER QUALITY AND~~ VEGETATION FIELD DATA SHEET

MTS

CI-2

WATERSHED FEATURES See CAP Maps	**Predominant Surrounding Landuse** ❑ Forest ❑ Commercial ❑ Field/Pasture ❑ Industrial ❑ Agricultural ❑ Other _____ ❑ Residential Adjacent Ed Brown **Local Watershed NPS Pollution** ❑ No evidence ❑ Some potential sources ❑ Obvious sources **Local Watershed Erosion** ❑ None ❑ Moderate ❑ Heavy
RIPARIAN VEGETATION (18 meter buffer)	**Indicate the dominant type and record the dominant species present** ❑ Trees ❑ Shrubs ❑ Grasses ❑ Herbaceous **dominant species present** _____
INSTREAM FEATURES See CAP Maps	**Estimated Reach Length** _____m **Estimated Stream Width** _____m **Sampling Reach Area** _____m^2 **Area in km^2 (m^2x1000)** _____km^2 **Estimated Stream Depth** _____m **Surface Velocity (at thalweg)** _____m/sec **Canopy Cover** ❑ Partly open ❑ Partly shaded ❑ Shaded **High Water Mark** _____m **Proportion of Reach Represented by Stream Morphology Types** ❑ Riffle_____% ❑ Run_____% ❑ Pool_____% **Channelized** ❑ Yes ❑ No **Dam Present** ❑ Yes ❑ No
LARGE WOODY DEBRIS	**LWD** _____m^2 Qualitative LWD present at shore **Density of LWD** _____m^2/km^2 **(LWD/ reach area)** some floating
AQUATIC VEGETATION	**Indicate the dominant type and record the dominant species present** ❑ Rooted emergent ❑ Rooted submergent ❑ Rooted floating ❑ Free floating ❑ Floating Algae ☒ Attached Algae **dominant species present** periphyton + duckweed + submerged aquatic vegetation (SAV) **Portion of the reach with aquatic vegetation** _____% ~~10~~ 20% periphyton 30-40% SAV
WATER QUALITY See Water Quality Logbook sheets	**Temperature**_____^{0}C **Specific Conductance**_____ **Dissolved Oxygen** _____ **pH** _____ **Turbidity** _____ **WQ Instrument Used** _____ **Water Odors** ☒ Normal/None ❑ Sewage ❑ Petroleum ❑ Chemical ❑ Fishy ❑ Other_____ **Water Surface Oils** ❑ Slick ❑ Sheen ❑ Globs ❑ Flecks ☒ None ❑ Other_____ **Turbidity (if not measured)** ☒ Clear ❑ Slightly turbid ❑ Turbid ❑ Opaque ❑ Stained ❑ Other_____
SEDIMENT/ SUBSTRATE	**Odors** ☒ Normal ❑ Sewage ❑ Petroleum ❑ Chemical ❑ Anaerobic ❑ None ❑ Other_____ **Oils** ☒ Absent ❑ Slight ❑ Moderate ❑ Profuse **Deposits** ❑ Sludge ❑ Sawdust ❑ Paper fiber ❑ Sand ❑ Relict shells ❑ Other_____ **Looking at stones which are not deeply embedded, are the undersides black in color?** ❑ Yes ☒ No

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)			ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)		
Substrate Type	**Diameter**	**% Composition in Sampling Reach**	**Substrate Type**	**Characteristic**	**% Composition in Sampling Area**
Bedrock			Detritus	sticks, wood, coarse plant materials (CPOM)	
Boulder	> 256 mm (10")	✓			
Cobble	64-256 mm (2.5"-10")	✓	Muck-Mud	black, very fine organic (FPOM)	
Gravel	2-64 mm (0.1"-2.5")	✓			
Sand	0.06-2mm (gritty)	✓	Marl	grey, shell fragments	
Silt	0.004-0.06 mm	✓			
Clay	< 0.004 mm (slick)	✓ MT			

CI-2 (Pg 2 of 2)

Source: Appendix A-1: Habitat Assessment and Physicochemical Characterization Field Data Sheets - Form 1

MTS

~~WATER QUALITY AND~~ VEGETATION FIELD DATA SHEET FOR HERRINGTON LAKE

LAKE

~~STREAM~~ NAME HERRINGTON	LOCATION CI-3 Curds Inlet
STATION # _____ RIVERMILE _____	STREAM CLASS
LAT See GPS LONG See GPS	RIVER BASIN
STORET #	AGENCY ICL, Ramboll Environ
INVESTIGATORS	
FORM COMPLETED BY AJS / MTS	DATE ~~8~~ 10-5-17 TIME ~~1440~~ 15:15 AM PM	REASON FOR SURVEY CAP

WEATHER CONDITIONS

Now		Past 24 hours
☐	storm (heavy rain)	☐
☐	rain (steady rain)	☐
☐	showers (intermittent)	☐
~~%~~ ☐	%cloud cover	☐ ~~%~~
~~☒~~	clear/sunny	~~☒~~

Has there been a heavy rain in the last 7 days? ☐ Yes ~~☒~~ No

Air Temperature ____ °C 70°s F

Other _____

SITE LOCATION/MAP

CI-3

Draw a map of the site and indicate the areas sampled (or attach a photograph)

See Cap

AV-001 ~~(0.5-2.0)~~ - CI3 - 171005

MTS

Vegetation ID

AV-001 - CI3 - 171005

Sample collected along shoreline at depths ~ 0-2ft that were wadeable. Mostly submerged aquatic vegetation.

~~STREAM~~ CHARACTERIZATION

Vegetation Sample Weight

Stream Subsystem MTS

~~☒ Perennial~~ ☐ Intermittent ☐ Tidal

Stream Type

~~☐ Coldwater~~ ~~☐ Warmwater~~

Stream Origin

☐ Glacial
☐ Non-glacial montane
☐ Swamp and bog
☐ Spring-fed
☐ Mixture of origins
☐ Other _____

Catchment Area _____ km²

Weight = 54.75 g

CI-3 (Page 1 of 2)

Source: Rapid Bioassessment Protocols For Use in Streams and Wadeable Rivers: Periphyton, Benthic Macroinvertebrates, and Fish, Second Edition - Form 1

~~WATER QUALITY AND~~ VEGETATION FIELD DATA SHEET

CI-3 MB

WATERSHED FEATURES See CAP Maps	**Predominant Surrounding Landuse** ❑ Forest ❑ Commercial ❑ Field/Pasture ❑ Industrial ❑ Agricultural ❑ Other ____ ❑ Residential Adjacent EW Bown **Local Watershed NPS Pollution** ❑ No evidence ❑ Some potential sources ❑ Obvious sources **Local Watershed Erosion** ❑ None ❑ Moderate ❑ Heavy
RIPARIAN VEGETATION (18 meter buffer)	**Indicate the dominant type and record the dominant species present** ❑ Trees ❑ Shrubs ❑ Grasses ❑ Herbaceous **dominant species present** ____
INSTREAM FEATURES See CAP Maps	**Estimated Reach Length** ____m **Estimated Stream Width** ____m **Sampling Reach Area** ____m^2 **Area in km² (m^2x1000)** ____km^2 **Estimated Stream Depth** ____m **Surface Velocity (at thalweg)** ____m/sec **Canopy Cover** ❑ Partly open ❑ Partly shaded ❑ Shaded **High Water Mark** ____m **Proportion of Reach Represented by Stream Morphology Types** ❑ Riffle ____% ❑ Run ____% ❑ Pool ____% **Channelized** ❑ Yes ❑ No **Dam Present** ❑ Yes ❑ No
LARGE WOODY DEBRIS	**LWD** ____m^2 Qualitative LWD present at shoreline **Density of LWD** ____m^2/km^2 **(LWD/ reach area)**
AQUATIC VEGETATION	**Indicate the dominant type and record the dominant species present** ❑ Rooted emergent ☒ Rooted submergent ❑ Rooted floating ❑ Free floating ❑ Floating Algae ☒ Attached Algae **dominant species present** Periphyton (long filaments) (<10% periphyton) + fine filaments + submerged aquatic vegetation SAV **Portion of the reach with aquatic vegetation** ____% ~80-90% SAV
WATER QUALITY See Water Quality Logbook Sheets	**Temperature** ____ °C **Specific Conductance** ____ **Dissolved Oxygen** ____ **pH** ____ **Turbidity** ____ **WQ Instrument Used** ____ **Water Odors** ☒ Normal/None ❑ Sewage ❑ Petroleum ❑ Chemical ❑ Fishy ❑ Other ____ **Water Surface Oils** ❑ Slick ❑ Sheen ❑ Globs ❑ Flecks ☒ None ❑ Other ____ **Turbidity (if not measured)** ☒ Clear ❑ Slightly turbid ❑ Turbid ❑ Opaque ❑ Stained ❑ Other ____
SEDIMENT/ SUBSTRATE	**Odors** ☒ Normal ❑ Sewage ❑ Petroleum ❑ Chemical ❑ Anaerobic ❑ None ❑ Other ____ **Oils** ☒ Absent ❑ Slight ❑ Moderate ❑ Profuse **Deposits** ❑ Sludge ❑ Sawdust ❑ Paper fiber ❑ Sand ❑ Relict shells ❑ Other ____ **Looking at stones which are not deeply embedded, are the undersides black in color?** ❑ Yes ☒ No

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)			ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)		
Substrate Type	**Diameter**	**% Composition in Sampling Reach**	**Substrate Type**	**Characteristic**	**% Composition in Sampling Area**
Bedrock		✓	Detritus (circled)	sticks, wood, coarse plant materials (CPOM)	
Boulder	> 256 mm (10")	✓			
Cobble	64-256 mm (2.5"-10")	✓	Muck-Mud (circled)	black, very fine organic (FPOM)	
Gravel	2-64 mm (0.1"-2.5")	✓			
Sand	0.06-2mm (gritty)	✓	Marl	grey, shell fragments	
Silt	0.004-0.06 mm	✓			
Clay	< 0.004 mm (slick)				

CI-3 (Page 2 of 2)

~~WATER QUALITY AND~~ VEGETATION FIELD DATA SHEET
MTS
FOR HERRINGTON LAKE

STREAM NAME CI-4	LOCATION Herrington Lake Curds Inlet
STATION # _____ RIVERMILE _____	STREAM CLASS
LAT See GPS LONG See GPS	RIVER BASIN
STORET #	AGENCY
INVESTIGATORS	
FORM COMPLETED BY MTS	DATE 10/5 TIME 4:40 AM (PM)
REASON FOR SURVEY CAP	

WEATHER CONDITIONS

Now

- ☐ storm (heavy rain)
- ☐ rain (steady rain)
- ☐ showers (intermittent)
- ~~50~~ %☐ %cloud cover
- ☒ clear/sunny

Past 24 hours

- ☐
- ☐
- ☐
- ☐ ~~75~~ % MB
- ☐

Has there been a heavy rain in the last 7 days? ☐ Yes ☒ No

Air Temperature 19 °C

Other _____

SITE LOCATION/MAP

CI-4

Draw a map of the site and indicate the areas sampled (or attach a photograph)

See CAP

AV-001 ~~(0.592)~~ -CI4-171005
MTS

Vegetation ID

AV-001-CI4-171005

Sample collected by divers at approximately 12 feet depth and 20ft depth (periphyton + attached ~~algae~~) submerged aquatic vegetation (SAV)

~~STREAM~~ CHARACTERIZATION

Vegetation sample weight

Stream Subsystem
☐ Perennial ☐ ~~Intermittent~~ ☐ Tidal MB

Stream Type
☐ Coldwater ☐ ~~Warmwater~~

Stream Origin
☐ Glacial
☐ Non-glacial montane
☐ Swamp and bog
☐ Spring-fed
☐ Mixture of origins
☐ Other _____

Catchment Area _____ km²

weight 65.8g

CI-4 (Page 1 of 2)

Source: Rapid Bioassessment Protocols For Use in Streams and Wadeable Rivers: Periphyton, Benthic Macroinvertebrates, and Fish, Second Edition - Form 1

~~WATER QUALITY AND~~ VEGETATION FIELD DATA SHEET

MTS

CI-4

WATERSHED FEATURES

See CAP Maps

Predominant Surrounding Landuse
☐ Forest ☐ Commercial
☐ Field/Pasture ☐ Industrial
☐ Agricultural ☐ Other _____
☐ Residential

Adjacent EW Brown

Local Watershed NPS Pollution
☐ No evidence ☐ Some potential sources
☐ Obvious sources

Local Watershed Erosion
☐ None ☐ Moderate ☐ Heavy

RIPARIAN VEGETATION (18 meter buffer)

Indicate the dominant type and record the dominant species present
☐ Trees ☐ Shrubs ☐ Grasses ☐ Herbaceous

dominant species present _____

INSTREAM FEATURES

See CAP Maps

Estimated Reach Length _____m

Estimated Stream Width _____m

Sampling Reach Area _____m^2

Area in km^2 (m^2x1000) _____km^2

Estimated Stream Depth _____m

Surface Velocity (at thalweg) _____m/sec

Canopy Cover
☐ Partly open ☐ Partly shaded ☐ Shaded

High Water Mark _____m

Proportion of Reach Represented by Stream Morphology Types
☐ Riffle_____% ☐ Run_____%
☐ Pool_____%

Channelized ☐ Yes ☐ No

Dam Present ☐ Yes ☐ No

LARGE WOODY DEBRIS

LWD _____m^2 LWD only in limited areas of shoreline

Density of LWD _____m^2/km^2 **(LWD/ reach area)**

AQUATIC VEGETATION

Indicate the dominant type and record the dominant species present
☐ Rooted emergent ☒ Rooted submergent ☐ Rooted floating ☐ Free floating
☐ Floating Algae ☒ Attached Algae

dominant species present Periphyton - long, thick filaments - 75% periphyton - 25% SAV

Portion of the reach with aquatic vegetation 5% Submerged Aquatic Vegetation (SAV)

WATER QUALITY

See Water Quality Logbook Sheets

Temperature_____° C

Specific Conductance_____

Dissolved Oxygen _____

pH _____

Turbidity _____

WQ Instrument Used _____

Water Odors
☒ Normal/None ☐ Sewage
☐ Petroleum ☐ Chemical
☐ Fishy ☐ Other_____

Water Surface Oils
☐ Slick ☐ Sheen ☐ Globs ☐ Flecks
☒ None ☐ Other_____

Turbidity (if not measured)
☒ Clear ☐ Slightly turbid ☐ Turbid
☐ Opaque ☐ Stained ☐ Other_____

SEDIMENT/ SUBSTRATE

Odors
☐ Normal ☐ Sewage ☐ Petroleum
☐ Chemical ☐ Anaerobic ☐ None
☐ Other_____

Oils
☐ Absent ☐ Slight ☐ Moderate ☐ Profuse

Deposits
☐ Sludge ☐ Sawdust ☐ Paper fiber ☐ Sand
☐ Relict shells ☐ Other_____

Looking at stones which are not deeply embedded, are the undersides black in color?
☐ Yes ☐ No

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)			ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)		
Substrate Type	**Diameter**	**% Composition in Sampling Reach**	**Substrate Type**	**Characteristic**	**% Composition in Sampling Area**
Bedrock			Detritus	sticks, wood, coarse plant materials (CPOM)	
Boulder	> 256 mm (10")	Rocky 65% ✓			
Cobble	64-256 mm (2.5"-10")	Rocky	Muck-Mud	black, very fine organic (FPOM)	
Gravel	2-64 mm (0.1"-2.5")	Rocky			
Sand	0.06-2mm (gritty)	Very deep	Marl	grey, shell fragments	
Silt	0.004-0.06 mm				
Clay	< 0.004 mm (slick)				

CI-4 (Page 2 of 2)

Source: Appendix A-1: Habitat Assessment and Physicochemical Characterization Field Data Sheets - Form 1

MMS

~~WATER QUALITY AND~~ VEGETATION FIELD DATA SHEET FOR HERRINGTON LAKE

STREAM NAME HQ Inlet	LOCATION Herrington Lake 2
STATION # _____ RIVERMILE _____	STREAM CLASS HQ Inlet 2
LAT GPS LONG GPS	RIVER BASIN
STORET #	AGENCY
INVESTIGATORS	
FORM COMPLETED BY MT Sorensen	DATE 10/6/17 TIME _____ AM PM — REASON FOR SURVEY CAP

WEATHER CONDITIONS

Now		Past 24 hours
☐	storm (heavy rain)	☐
☐	rain (steady rain)	☐
☐	showers (intermittent)	☐
___% ☐	%cloud cover	☐ ___%
☒	clear/sunny	☒

Has there been a heavy rain in the last 7 days? ☐ Yes ☒ No

Air Temperature ___ °C 70's °F

Other _____

SITE LOCATION/MAP

CI-1

Draw a map of the site and indicate the areas sampled (or attach a photograph)

Sample ID
AV-001-HQ-171006
(Collected by divers)

Very fine periphyton attached to rocks

STREAM CHARACTERIZATION

Stream Subsystem ☐ Perennial ☐ Intermittent ☐ Tidal

Stream Type ☐ Coldwater ☐ Warmwater

Stream Origin
☒ Glacial
☐ Non-glacial montane
☐ Swamp and bog
☐ Spring-fed
☐ Mixture of origins
☐ Other _____

Catchment Area _____ km²

Weight 11g

HQ Inlet (Pg 1 of 2)

Source: Rapid Bioassessment Protocols For Use in Streams and Wadeable Rivers: Periphyton, Benthic Macroinvertebrates, and Fish, Second Edition - Form 1

~~WATER QUALITY AND~~ VEGETATION FIELD DATA SHEET

HQ Inlet

WATERSHED FEATURES

See CAP Maps

Predominant Surrounding Landuse
❑ Forest ❑ Commercial
❑ Field/Pasture ❑ Industrial
❑ Agricultural ❑ Other _____
❑ Residential

Local Watershed NPS Pollution
❑ No evidence ❑ Some potential sources
❑ Obvious sources

Local Watershed Erosion
❑ None ❑ Moderate ❑ Heavy

RIPARIAN VEGETATION (18 meter buffer)

Indicate the dominant type and record the dominant species present
❑ Trees ❑ Shrubs ❑ Grasses ❑ Herbaceous

dominant species present _____

INSTREAM FEATURES

See CAP Maps

Estimated Reach Length _____m
Estimated Stream Width _____m
Sampling Reach Area _____m^2
Area in km^2 (m^2x1000) _____km^2
Estimated Stream Depth _____m
Surface Velocity (at thalweg) _____m/sec

Canopy Cover
❑ Partly open ❑ Partly shaded ❑ Shaded

High Water Mark _____m

Proportion of Reach Represented by Stream Morphology Types
❑ Riffle_____% ❑ Run_____%
❑ Pool_____%

Channelized ❑ Yes ❑ No

Dam Present ❑ Yes ❑ No

LARGE WOODY DEBRIS

LWD _____m^2 LWD in Inlet along shoreline
Density of LWD _____m^2/km^2 **(LWD/ reach area)**

AQUATIC VEGETATION

Indicate the dominant type and record the dominant species present
❑ Rooted emergent ❑ Rooted submergent ❑ Rooted floating ❑ Free floating
❑ Floating Algae ☒ Attached Algae

dominant species present 100% periphyton (Very fine attached to rocks)

Portion of the reach with aquatic vegetation ____%

WATER QUALITY

See Water Quality Sheets & Logbook

Temperature_____^{0}C
Specific Conductance_____
Dissolved Oxygen _____
pH _____
Turbidity _____
WQ Instrument Used _____

Water Odors
☒ Normal/None ❑ Sewage
❑ Petroleum ❑ Chemical
❑ Fishy ❑ Other_____

Water Surface Oils
❑ Slick ❑ Sheen ❑ Globs ❑ Flecks
☒ None ❑ Other_____

Turbidity (if not measured)
☒ Clear ❑ Slightly turbid ❑ Turbid
❑ Opaque ❑ Stained ❑ Other_____

SEDIMENT/ SUBSTRATE

Odors
❑ Normal ❑ Sewage ❑ Petroleum
❑ Chemical ❑ Anaerobic ❑ None
❑ Other_____

Oils
☒ Absent ❑ Slight ❑ Moderate ❑ Profuse

Deposits
❑ Sludge ❑ Sawdust ❑ Paper fiber ❑ Sand
❑ Relict shells ❑ Other_____

Looking at stones which are not deeply embedded, are the undersides black in color?
❑ Yes ☒ No

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)			ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)		
Substrate Type	**Diameter**	**% Composition in Sampling Reach**	**Substrate Type**	**Characteristic**	**% Composition in Sampling Area**
Bedrock			Detritus	sticks, wood, coarse plant materials (CPOM)	
Boulder	> 256 mm (10")				
Cobble	64-256 mm (2.5"-10")		Muck-Mud	black, very fine organic (FPOM)	
Gravel	2-64 mm (0.1"-2.5")				
Sand	0.06-2mm (gritty)		Marl	grey, shell fragments	
Silt	0.004-0.06 mm				
Clay	< 0.004 mm (slick)				

HQ Inlet (Pg 2of2)

Source: Appendix A-1: Habitat Assessment and Physicochemical Characterization Field Data Sheets - Form 1

~~WATER QUALITY AND~~ VEGETATION FIELD DATA SHEET
MTS FOR HERRINGTON LAKE

STREAM NAME LHL1	LOCATION Herrington Lake LHL-1 Rock Run Embayment	
STATION # _____ RIVERMILE _____	STREAM CLASS NA	
LAT GPS LONG GPS	RIVER BASIN Herrington Lake	
STORET # AV	AGENCY	
INVESTIGATORS		
FORM COMPLETED BY Forrest Wade/MTS	DATE 10/12/17 TIME 0930 AM PM	REASON FOR SURVEY CAP

WEATHER CONDITIONS

Now		Past 24 hours
☐	storm (heavy rain)	☐
☐	rain (steady rain)	☐
☐	showers (intermittent)	☐
100% ☐	%cloud cover	☐ 100% MTS
☐	clear/sunny	☒

Has there been a heavy rain in the last 7 days? ☐ Yes ☐ No

Air Temperature ____ °C High 69°F

Other _____

SITE LOCATION/MAP

LHL ~~A~~ 1

Draw a map of the site and indicate the areas sampled (or attach a photograph)

See CAP

~~AV-001 (0-1) CTI - 1710~~ MTS

LHL1

MTS

~~AV-001-CTI~~ MTS

~~Vegetation ID~~

AV-001 - LHL1 - 171012

This location in embayment had a ~~deep~~ shelf on one side with submerged aquatic vegetation (algae + periphyton). Collected by divers.

~~STREAM~~ CHARACTERIZATION

Vegetation Sample Weight

Stream Subsystem MTS
☐ Perennial ☐ ~~Intermittent~~ ☐ ~~Tidal~~

Stream Type
☐ Coldwater ☐ ~~Warmwater~~

Stream Origin
☐ Glacial
☐ Non-glacial montane
☐ Swamp and bog
☐ Spring-fed
☐ Mixture of origins
☐ Other _____

Catchment Area _____ km²

Weight 96.5g

LHL-1 (Pg 1 of 2)

Source: Rapid Bioassessment Protocols For Use in Streams and Wadeable Rivers: Periphyton, Benthic Macroinvertebrates, and Fish, Second Edition - Form 1

~~WATER QUALITY AND~~ VEGETATION FIELD DATA SHEET

LHL-1 MTS

WATERSHED FEATURES See CAP

Predominant Surrounding Landuse
☐ Forest ☐ Commercial
☐ Field/Pasture ☐ Industrial
☐ Agricultural ☐ Other _____
☒ Residential

Local Watershed NPS Pollution
☐ No evidence ☐ Some potential sources
☐ Obvious sources

Local Watershed Erosion
☐ None ☐ Moderate ☐ Heavy

RIPARIAN VEGETATION (18 meter buffer)

Indicate the dominant type and record the dominant species present
☐ Trees ☐ Shrubs ☐ Grasses ☐ Herbaceous

dominant species present _____

INSTREAM FEATURES See CAP MAP

Estimated Reach Length _____m
Estimated Stream Width _____m
Sampling Reach Area _____m^2
Area in km^2 (m^2x1000) _____km^2
Estimated Stream Depth _____m
Surface Velocity (at thalweg) _____m/sec

Canopy Cover
☐ Partly open ☐ Partly shaded ☐ Shaded

High Water Mark _____m

Proportion of Reach Represented by Stream Morphology Types
☐ Riffle _____% ☐ Run _____%
☐ Pool _____%

Channelized ☐ Yes ☐ No

Dam Present ☐ Yes ☐ No

LARGE WOODY DEBRIS

LWD _____m^2
Density of LWD _____m^2/km^2 **(LWD/ reach area)** Qualitative - Present along shoreline

AQUATIC VEGETATION

Indicate the dominant type and record the dominant species present
☐ Rooted emergent ☐ Rooted submergent ☐ Rooted floating ☐ Free floating
☐ Floating Algae ☒ Attached Algae

dominant species present 100% periphyton

Portion of the reach with aquatic vegetation _____%

WATER QUALITY See Water Quality Sheet

Temperature _____ ° C
Specific Conductance _____
Dissolved Oxygen _____
pH _____
Turbidity _____
WQ Instrument Used _____

Water Odors
☒ Normal/None ☐ Sewage
☐ Petroleum ☐ Chemical
☐ Fishy ☐ Other _____

Water Surface Oils
☐ Slick ☐ Sheen ☐ Globs ☐ Flecks
☒ None ☐ Other _____

Turbidity (if not measured)
☒ Clear ☐ Slightly turbid ☐ Turbid
☐ Opaque ☐ Stained ☐ Other _____

SEDIMENT/ SUBSTRATE

Odors
☒ Normal ☐ Sewage ☐ Petroleum
☐ Chemical ☐ Anaerobic ☐ None
☐ Other _____

Oils
☐ Absent ☐ Slight ☐ Moderate ☐ Profuse

Deposits
☐ Sludge ☐ Sawdust ☐ Paper fiber ☐ Sand
☐ Relict shells ☐ Other _____

Looking at stones which are not deeply embedded, are the undersides black in color?
☐ Yes ☒ No

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)			ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)		
Substrate Type	**Diameter**	**% Composition in Sampling Reach**	**Substrate Type**	**Characteristic**	**% Composition in Sampling Area**
Bedrock		Rocky Reef	Detritus	sticks, wood, coarse plant materials (CPOM)	Sleepshell, little access to sediment
Boulder	> 256 mm (10")				
Cobble	64-256 mm (2.5"-10")		Muck-Mud	black, very fine organic (FPOM)	
Gravel	2-64 mm (0.1"-2.5")				
Sand	0.06-2mm (gritty)	Vallisneria	Marl	grey, shell fragments	
Silt	0.004-0.06 mm				
Clay	< 0.004 mm (slick)				

LHL-1 (Pg 2 of 2)

Source: Appendix A-1: Habitat Assessment and Physicochemical Characterization Field Data Sheets - Form 1

~~WATER QUALITY AND~~ VEGETATION FIELD DATA SHEET
MTS
FOR HERRINGTON LAKE

~~STREAM~~ NAME LHL-2	LOCATION LHL-2 (Near Dam)	
STATION # _____ RIVERMILE _____	STREAM CLASS	
LAT See GPS LONG See GPS	RIVER BASIN Herrington Lake	
STORET #	AGENCY	
INVESTIGATORS		
FORM COMPLETED BY MT Sorensen	DATE 10/12 TIME _____ AM PM	REASON FOR SURVEY CAP

WEATHER CONDITIONS

Now		Past 24 hours
☐	storm (heavy rain)	☐
☐	rain (steady rain)	☐
☐	showers (intermittent)	☐
50 %	%cloud cover	☐ %
☐	clear/sunny	☐

Has there been a heavy rain in the last 7 days? ☒ Yes ☐ No

Air Temperature ____ °C High 69°F

Other _____

SITE LOCATION/MAP

LHL-2

Draw a map of the site and indicate the areas sampled (or attach a photograph)

See CAP

~~AV-001 (0-1)~~

MTS
vegetation ID

AV-001-LHL-171012

Sample location near dam was difficult to access and obtain vegetation from wading. Divers collected attached algae & periphyton from depths > 10ft.

~~STREAM~~ CHARACTERIZATION

Vegetation sample weight

Stream Subsystem MTS
☐ Perennial ☐ ~~Intermittent~~ ☐ ~~Tidal~~

Stream Type
☐ Coldwater ☐ ~~Warmwater~~

Stream Origin
☐ Glacial
☐ Non-glacial montane
☐ Swamp and bog
☐ Spring-fed
☐ Mixture of origins
☐ Other _____

Catchment Area _____ km²

Weight 50.2g

LHL-2 (Pg 1 of 2)

Source: Rapid Bioassessment Protocols For Use in Streams and Wadeable Rivers: Periphyton, Benthic Macroinvertebrates, and Fish, Second Edition - Form 1

~~WATER QUALITY AND~~ VEGETATION FIELD DATA SHEET

LHL-2 MTS

WATERSHED FEATURES
See CAP

Predominant Surrounding Landuse
❑ Forest ❑ Commercial
❑ Field/Pasture ❑ Industrial
❑ Agricultural ☒ Other Dam
❑ Residential

Local Watershed NPS Pollution
❑ No evidence ❑ Some potential sources
❑ Obvious sources

Local Watershed Erosion
❑ None ❑ Moderate ❑ Heavy

RIPARIAN VEGETATION (18 meter buffer)

Indicate the dominant type and record the dominant species present
❑ Trees ❑ Shrubs ❑ Grasses ❑ Herbaceous

dominant species present _____

INSTREAM FEATURES
See CAP Maps

Estimated Reach Length _____m

Estimated Stream Width _____m

Sampling Reach Area _____m^2

Area in km^2 (m^2x1000) _____km^2

Estimated Stream Depth _____m

Surface Velocity (at thalweg) _____m/sec

Canopy Cover
❑ Partly open ❑ Partly shaded ❑ Shaded

High Water Mark _____m

Proportion of Reach Represented by Stream Morphology Types
❑ Riffle_____% ❑ Run_____%
❑ Pool_____%

Channelized ❑ Yes ❑ No

Dam Present ☒ Yes ❑ No

LARGE WOODY DEBRIS

LWD _____m^2

Density of LWD _____m^2/km^2 **(LWD/ reach area)**

AQUATIC VEGETATION

Indicate the dominant type and record the dominant species present
❑ Rooted emergent ❑ Rooted submergent ❑ Rooted floating ❑ Free floating
❑ Floating Algae ☒ Attached Algae

dominant species present Periphyton & attached algae → ~90% attached algae

Portion of the reach with aquatic vegetation ~5% Shoreline ~~entire~~ & depth sampled

WATER QUALITY
See Water Quality Sheets + Logbook

Temperature_____^{0} C

Specific Conductance_____

Dissolved Oxygen _____

pH _____

Turbidity _____

WQ Instrument Used _____

Water Odors
☒ Normal/None ❑ Sewage
❑ Petroleum ❑ Chemical
❑ Fishy ❑ Other_____

Water Surface Oils
❑ Slick ❑ Sheen ❑ Globs ❑ Flecks
☒ None ❑ Other_____

Turbidity (if not measured)
☒ Clear ❑ Slightly turbid ❑ Turbid
❑ Opaque ❑ Stained ❑ Other_____

SEDIMENT/ SUBSTRATE

Odors
☒ Normal ❑ Sewage ❑ Petroleum
❑ Chemical ❑ Anaerobic ❑ None
❑ Other_____

Oils
☒ Absent ❑ Slight ❑ Moderate ❑ Profuse

Deposits
❑ Sludge ❑ Sawdust ❑ Paper fiber ❑ Sand
❑ Relict shells ❑ Other_____

Looking at stones which are not deeply embedded, are the undersides black in color?
❑ Yes ☒ No

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)			ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)		
Substrate Type	**Diameter**	**% Composition in Sampling Reach**	**Substrate Type**	**Characteristic**	**% Composition in Sampling Area**
Bedrock		Shelf Near Dam	Detritus	sticks, wood, coarse plant materials (CPOM)	Collection at dam along shoreline
Boulder	> 256 mm (10")				
Cobble	64-256 mm (2.5"-10")		Muck-Mud	black, very fine organic (FPOM)	
Gravel	2-64 mm (0.1"-2.5")				
Sand	0.06-2mm (gritty)		Marl	grey, shell fragments	
Silt	0.004-0.06 mm				
Clay	< 0.004 mm (slick)				

LHL-2 (Pg 2 of 2)

Source: Appendix A-1: Habitat Assessment and Physicochemical Characterization Field Data Sheets - Form 1

WATER QUALITY AND VEGETATION FIELD DATA SHEET FOR HERRINGTON LAKE

STREAM NAME LHL-3	LOCATION LHL-3	
STATION # _____ RIVERMILE _____	STREAM CLASS	
LAT See GPS LONG See GPS	RIVER BASIN Herrington Lake	
STORET #	AGENCY	
INVESTIGATORS		
FORM COMPLETED BY MTSon	DATE 10/12 TIME _____ AM PM	REASON FOR SURVEY CAP

WEATHER CONDITIONS

Now		Past 24 hours
☐	storm (heavy rain)	☐
☐	rain (steady rain)	☐
☐	showers (intermittent)	☐
50 %	%cloud cover	☐ ____ %
☐	clear/sunny	☒

Has there been a heavy rain in the last 7 days? ☒ Yes ☐ No

Air Temperature _____ ° C

Other _____

SITE LOCATION/MAP

See CAP
LHL-3

Draw a map of the site and indicate the areas sampled (or attach a photograph)

Sample ID
AV-001 - LHL3 - 171012

Sample collected by waders along shoreline. Depth ~0-2ft.

STREAM CHARACTERIZATION

Sample Weight

Stream Subsystem MWS
☐ Perennial ☐ Intermittent ☐ Tidal

Stream Type MWS
☐ Coldwater ☐ Warmwater

Stream Origin
☐ Glacial
☐ Non-glacial montane
☐ Swamp and bog
☐ Spring-fed
☐ Mixture of origins
☐ Other _____

Catchment Area _____ km²

Weight 28.7g

LHL-3 (Pg 1 of 2)

Source: Rapid Bioassessment Protocols For Use in Streams and Wadeable Rivers: Periphyton, Benthic Macroinvertebrates, and Fish, Second Edition - Form 1

~~WATER QUALITY AND~~ VEGETATION FIELD DATA SHEET

LHL-3 MTS

WATERSHED FEATURES

See CAP

Predominant Surrounding Landuse
❑ Forest ❑ Commercial
❑ Field/Pasture ❑ Industrial
❑ Agricultural ❑ Other _____
❑ Residential

Local Watershed NPS Pollution
❑ No evidence ❑ Some potential sources
❑ Obvious sources

Local Watershed Erosion
❑ None ❑ Moderate ❑ Heavy

RIPARIAN VEGETATION (18 meter buffer)

Indicate the dominant type and record the dominant species present
❑ Trees ❑ Shrubs ❑ Grasses ❑ Herbaceous

dominant species present _____

INSTREAM FEATURES

See CAP maps

Estimated Reach Length _____m
Estimated Stream Width _____m
Sampling Reach Area _____m^2
Area in km^2 (m^2x1000) _____km^2
Estimated Stream Depth _____m
Surface Velocity (at thalweg) _____m/sec

Canopy Cover
❑ Partly open ❑ Partly shaded ❑ Shaded

High Water Mark _____m

Proportion of Reach Represented by Stream Morphology Types
❑ Riffle_____% ❑ Run_____%
❑ Pool_____%

Channelized ❑ Yes ❑ No

Dam Present ❑ Yes ❑ No

LARGE WOODY DEBRIS

LWD _____m^2 A little along shoreline
Density of LWD _____m^2/km^2 **(LWD/ reach area)**

AQUATIC VEGETATION

Indicate the dominant type and record the dominant species present
❑ Rooted emergent ❑ Rooted submergent ❑ Rooted floating ❑ Free floating
❑ Floating Algae ☒ Attached Algae

dominant species present Periphyton + attached algae (~50% algae + 50% periphyton)

Portion of the reach with aquatic vegetation ____% Shoreline

WATER QUALITY

See Water Quality sheets & Logbook

Temperature_____^{0}C
Specific Conductance_____
Dissolved Oxygen _____
pH _____
Turbidity _____
WQ Instrument Used _____

Water Odors
☒ Normal/None ❑ Sewage
❑ Petroleum ❑ Chemical
❑ Fishy ❑ Other_____

Water Surface Oils
❑ Slick ❑ Sheen ❑ Globs ❑ Flecks
☒ None ❑ Other_____

Turbidity (if not measured)
☒ Clear ❑ Slightly turbid ❑ Turbid
❑ Opaque ❑ Stained ❑ Other_____

SEDIMENT/ SUBSTRATE

Odors
☒ Normal ❑ Sewage ❑ Petroleum
❑ Chemical ❑ Anaerobic ❑ None
❑ Other_____

Oils
☒ Absent ❑ Slight ❑ Moderate ❑ Profuse

Deposits
❑ Sludge ❑ Sawdust ❑ Paper fiber ❑ Sand
❑ Relict shells ❑ Other_____

Looking at stones which are not deeply embedded, are the undersides black in color?
❑ Yes ☒ No

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)			ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)		
Substrate Type	**Diameter**	**% Composition in Sampling Reach**	**Substrate Type**	**Characteristic**	**% Composition in Sampling Area**
Bedrock			Detritus	sticks, wood, coarse plant materials (CPOM)	
Boulder	> 256 mm (10")				
Cobble	64-256 mm (2.5"-10")		Muck-Mud	black, very fine organic (FPOM)	
Gravel	2-64 mm (0.1"-2.5")				
Sand	0.06-2mm (gritty)		Marl	grey, shell fragments	
Silt	0.004-0.06 mm				
Clay	< 0.004 mm (slick)				

LHL-3 (Pg 2 of 2)

Source: Appendix A-1: Habitat Assessment and Physicochemical Characterization Field Data Sheets - Form 1

~~WATER QUALITY AND~~ VEGETATION FIELD DATA SHEET FOR HERRINGTON LAKE

STREAM NAME LHL-4	LOCATION LHL-4
STATION # _____ RIVERMILE _____	STREAM CLASS
LAT _____ LONG _____	RIVER BASIN Herrington Lake
STORET #	AGENCY
INVESTIGATORS	
FORM COMPLETED BY [signature]	DATE 10/12 TIME _____ AM (PM) / REASON FOR SURVEY CAP

WEATHER CONDITIONS

Now		Past 24 hours
☐	storm (heavy rain)	☐
☐	rain (steady rain)	☐
☐	showers (intermittent)	☐
90 %cloud cover		☐ ___%
☐	clear/sunny	☒ ??

Has there been a heavy rain in the last 7 days? ☒ Yes ☐ No

Air Temperature _____ ° C

Other _____

SITE LOCATION/MAP

See CAP
LHL-4

Draw a map of the site and indicate the areas sampled (or attach a photograph)

Sample ID
AV-001-LHL3-171012
(Collected by divers)

~~STREAM~~ CHARACTERIZATION

Sample Weight

Stream Subsystem ☐ ~~Perennial~~ ☐ ~~Intermittent~~ MTS ☐ Tidal

Stream Type ☐ ~~Coldwater~~ ☐ ~~Warmwater~~

Stream Origin
☐ Glacial
☐ Non-glacial montane
☐ Swamp and bog
☐ Spring-fed
☐ Mixture of origins
☐ Other ____

Catchment Area _____ km²

Weight >50g (with water)

Source: Rapid Bioassessment Protocols For Use in Streams and Wadeable Rivers: Periphyton, Benthic Macroinvertebrates, and Fish, Second Edition - Form 1

WATER QUALITY AND VEGETATION FIELD DATA SHEET

LHL-4

WATERSHED FEATURES See CAP	**Predominant Surrounding Landuse** ❑ Forest ❑ Commercial ❑ Field/Pasture ❑ Industrial ❑ Agricultural ❑ Other _____ ❑ Residential **Local Watershed NPS Pollution** ❑ No evidence ❑ Some potential sources ❑ Obvious sources **Local Watershed Erosion** ❑ None ❑ Moderate ❑ Heavy
RIPARIAN VEGETATION (18 meter buffer)	**Indicate the dominant type and record the dominant species present** ❑ Trees ❑ Shrubs ❑ Grasses ❑ Herbaceous **dominant species present** _____
INSTREAM FEATURES See CAP Maps	**Estimated Reach Length** _____m **Estimated Stream Width** _____m **Sampling Reach Area** _____m^2 **Area in km^2 (m^2x1000)** _____km^2 **Estimated Stream Depth** _____m **Surface Velocity (at thalweg)** _____m/sec **Canopy Cover** ❑ Partly open ❑ Partly shaded ❑ Shaded **High Water Mark** _____m **Proportion of Reach Represented by Stream Morphology Types** ❑ Riffle_____% ❑ Run_____% ❑ Pool_____% **Channelized** ❑ Yes ❑ No **Dam Present** ❑ Yes ❑ No
LARGE WOODY DEBRIS	**LWD** _____m^2 Some submerged along shoreline **Density of LWD** _____m^2/km^2 (LWD/ reach area)
AQUATIC VEGETATION	**Indicate the dominant type and record the dominant species present** ❑ Rooted emergent ❑ Rooted submergent ❑ Rooted floating ❑ Free floating ❑ Floating Algae ☑ Attached Algae **dominant species present** Periphyton + attached algae **Portion of the reach with aquatic vegetation** ____% (80% algae, 20% periphyton)
WATER QUALITY See water Quality Logbook + Data Sheets	**Temperature**_____^{0} C **Specific Conductance**_____ **Dissolved Oxygen** _____ **pH** _____ **Turbidity** _____ **WQ Instrument Used** _____ **Water Odors** ☑ Normal/None ❑ Sewage ❑ Petroleum ❑ Chemical ❑ Fishy ❑ Other_____ **Water Surface Oils** ❑ Slick ❑ Sheen ❑ Globs ❑ Flecks ☑ None ❑ Other_____ **Turbidity (if not measured)** ☑ Clear ❑ Slightly turbid ❑ Turbid ❑ Opaque ❑ Stained ❑ Other_____
SEDIMENT/ SUBSTRATE	**Odors** ☑ Normal ❑ Sewage ❑ Petroleum ❑ Chemical ❑ Anaerobic ❑ None ❑ Other_____ **Oils** ☑ Absent ❑ Slight ❑ Moderate ❑ Profuse **Deposits** ❑ Sludge ❑ Sawdust ❑ Paper fiber ❑ Sand ❑ Relict shells ❑ Other_____ **Looking at stones which are not deeply embedded, are the undersides black in color?** ❑ Yes ☑ No

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)			ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)		
Substrate Type	**Diameter**	**% Composition in Sampling Reach**	**Substrate Type**	**Characteristic**	**% Composition in Sampling Area**
Bedrock			Detritus	sticks, wood, coarse plant materials (CPOM)	
Boulder	> 256 mm (10")				
Cobble	64-256 mm (2.5"-10")		Muck-Mud	black, very fine organic (FPOM)	
Gravel	2-64 mm (0.1"-2.5")				
Sand	0.06-2mm (gritty)		Marl	grey, shell fragments	
Silt	0.004-0.06 mm				
Clay	< 0.004 mm (slick)				

LHL-4 (Page 2 of 2)

Source: Appendix A-1: Habitat Assessment and Physicochemical Characterization Field Data Sheets - Form 1

~~WATER QUALITY AND~~ VEGETATION FIELD DATA SHEET FOR HERRINGTON LAKE

STREAM NAME LHL5	LOCATION Herrington Lake	
STATION # _____ RIVERMILE _____	STREAM CLASS Mallard Cove / Cave Run	
LAT GPS LONG GPS	RIVER BASIN Herrington Lake	
STORET # AV	AGENCY	
INVESTIGATORS		
FORM COMPLETED BY M.T. Sorensen	DATE 10/12/17 TIME 10:30 AM PM	REASON FOR SURVEY CAP

WEATHER CONDITIONS

Now		Past 24 hours
☐	storm (heavy rain)	☐
☐	rain (steady rain)	☐
☐	showers (intermittent)	☐
100 % ☒	%cloud cover	~~☐ 100%~~
☐	clear/sunny	☒

Has there been a heavy rain in the last 7 days? ☒ Yes ☐ No

Air Temperature _____ °C

Other _____

SITE LOCATION/MAP

See CAP
LHL-5

Draw a map of the site and indicate the areas sampled (or attach a photograph)

Sample ID
AV-001-LHL5-171012
(Collected by divers)

STREAM CHARACTERIZATION

Stream Subsystem MTS
~~☐ Perennial~~ ☐ Intermittent ☐ Tidal

Stream Type
~~☐ Coldwater~~ ☐ Warmwater

Stream Origin
☐ Glacial
☐ Non-glacial montane
☐ Swamp and bog
☐ Spring-fed
☐ Mixture of origins
☐ Other _____

Catchment Area _____ km²

Weight 40.79

LHL5 (Pg 1 of 2)

Source: Rapid Bioassessment Protocols For Use in Streams and Wadeable Rivers: Periphyton, Benthic Macroinvertebrates, and Fish, Second Edition - Form 1

WATER QUALITY AND VEGETATION FIELD DATA SHEET

LHL-5

WATERSHED FEATURES

See CAP

Predominant Surrounding Landuse
❑ Forest ❑ Commercial
❑ Field/Pasture ❑ Industrial
❑ Agricultural ❑ Other _____
❑ Residential

Local Watershed NPS Pollution
❑ No evidence ❑ Some potential sources
❑ Obvious sources

Local Watershed Erosion
❑ None ❑ Moderate ❑ Heavy

RIPARIAN VEGETATION (18 meter buffer)

Indicate the dominant type and record the dominant species present
❑ Trees ❑ Shrubs ❑ Grasses ❑ Herbaceous

dominant species present _____

INSTREAM FEATURES

See CAP Maps

Estimated Reach Length _____m

Estimated Stream Width _____m

Sampling Reach Area _____m^2

Area in km^2 (m^2x1000) _____km^2

Estimated Stream Depth _____m

Surface Velocity (at thalweg) _____m/sec

Canopy Cover
❑ Partly open ❑ Partly shaded ❑ Shaded

High Water Mark _____m

Proportion of Reach Represented by Stream Morphology Types
❑ Riffle_____% ❑ Run_____%
❑ Pool_____%

Channelized ❑ Yes ❑ No

Dam Present ❑ Yes ❑ No

LARGE WOODY DEBRIS

LWD _____m^2

Density of LWD _____m^2/km^2 **(LWD/ reach area)**

AQUATIC VEGETATION

Indicate the dominant type and record the dominant species present
❑ Rooted emergent ❑ Rooted submergent ❑ Rooted floating ❑ Free floating
❑ Floating Algae ☒ Attached Algae

dominant species present 75% submerged algae + 25% periphyton

Portion of the reach with aquatic vegetation ____%

WATER QUALITY

See Water Quality Sheets

Temperature_____^{0} C

Specific Conductance_____

Dissolved Oxygen _____

pH _____

Turbidity _____

WQ Instrument Used _____

Water Odors
☒ Normal/None ❑ Sewage
❑ Petroleum ❑ Chemical
❑ Fishy ❑ Other_____

Water Surface Oils
❑ Slick ❑ Sheen ❑ Globs ❑ Flecks
☒ None ❑ Other_____

Turbidity (if not measured)
☒ Clear ❑ Slightly turbid ❑ Turbid
❑ Opaque ❑ Stained ❑ Other_____

SEDIMENT/ SUBSTRATE

Odors
☒ Normal ❑ Sewage ❑ Petroleum
❑ Chemical ❑ Anaerobic ❑ None
❑ Other_____

Oils
☒ Absent ❑ Slight ❑ Moderate ❑ Profuse

Deposits
❑ Sludge ❑ Sawdust ❑ Paper fiber ❑ Sand
❑ Relict shells ❑ Other_____

Looking at stones which are not deeply embedded, are the undersides black in color?
❑ Yes ☒ No

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)			ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)		
Substrate Type	**Diameter**	**% Composition in Sampling Reach**	**Substrate Type**	**Characteristic**	**% Composition in Sampling Area**
Bedrock			Detritus	sticks, wood, coarse plant materials (CPOM)	
Boulder	> 256 mm (10")				
Cobble	64-256 mm (2.5"-10")		Muck-Mud	black, very fine organic (FPOM)	
Gravel	2-64 mm (0.1"-2.5")				
Sand	0.06-2mm (gritty)		Marl	grey, shell fragments	
Silt	0.004-0.06 mm				
Clay	< 0.004 mm (slick)				

LHL-5(Pg 2 of 2)

Source: Appendix A-1: Habitat Assessment and Physicochemical Characterization Field Data Sheets - Form 1

~~WATER QUALITY AND~~ VEGETATION FIELD DATA SHEET FOR HERRINGTON LAKE

STREAM NAME LHL-6	LOCATION	
STATION # _____ RIVERMILE _____	STREAM CLASS	
LAT GPS LONG GPS	RIVER BASIN	
STORET # AV	AGENCY	
INVESTIGATORS		
FORM COMPLETED BY MT Sorensen	DATE 10/12/17 AM PM TIME _____	REASON FOR SURVEY CAP

WEATHER CONDITIONS

Now		Past 24 hours
☐	storm (heavy rain)	☐
☐	rain (steady rain)	☐
☐	showers (intermittent)	☐
___% ☐	%cloud cover	☐ ___%
☐	clear/sunny	☐

Has there been a heavy rain in the last 7 days? ☐ Yes ☐ No

Air Temperature _____ ° C

Other _____

SITE LOCATION/MAP

See CAP
LHL-5

Draw a map of the site and indicate the areas sampled (or attach a photograph)

Sample ID

AV-001-LHL5 -17/10/12
(Collected by divers)

STREAM CHARACTERIZATION

Stream Subsystem
☐ Perennial ~~☐ Intermittent ☐ Tidal~~

Stream Type
☐ Coldwater ~~☐ Warmwater~~

Stream Origin
☐ Glacial
☐ Non-glacial montane
☐ Swamp and bog
☐ Spring-fed
☐ Mixture of origins
☐ Other _____

Catchment Area _____ km²

Weight 32.5g

LHL-6 (Page 1 of 2)

Source: Rapid Bioassessment Protocols For Use in Streams and Wadeable Rivers: Periphyton, Benthic Macroinvertebrates, and Fish, Second Edition - Form 1

~~WATER QUALITY AND~~ VEGETATION FIELD DATA SHEET

LHL-6

WATERSHED FEATURES See CAP	**Predominant Surrounding Landuse** ❑ Forest ❑ Commercial ❑ Field/Pasture ❑ Industrial ❑ Agricultural ❑ Other _____ ❑ Residential **Local Watershed NPS Pollution** ❑ No evidence ❑ Some potential sources ❑ Obvious sources **Local Watershed Erosion** ❑ None ❑ Moderate ❑ Heavy
RIPARIAN VEGETATION (18 meter buffer)	**Indicate the dominant type and record the dominant species present** ❑ Trees ❑ Shrubs ❑ Grasses ❑ Herbaceous **dominant species present** _____
INSTREAM FEATURES See CAP Maps	**Estimated Reach Length** _____m **Estimated Stream Width** _____m **Sampling Reach Area** _____m^2 **Area in km^2 (m^2x1000)** _____km^2 **Estimated Stream Depth** _____m **Surface Velocity (at thalweg)** _____m/sec **Canopy Cover** ❑ Partly open ❑ Partly shaded ❑ Shaded **High Water Mark** _____m **Proportion of Reach Represented by Stream Morphology Types** ❑ Riffle_____% ❑ Run_____% ❑ Pool_____% **Channelized** ❑ Yes ❑ No **Dam Present** ❑ Yes ❑ No
LARGE WOODY DEBRIS	**LWD** _____m^2 **Density of LWD** _____m^2/km^2 **(LWD/ reach area)**
AQUATIC VEGETATION	**Indicate the dominant type and record the dominant species present** ❑ Rooted emergent ❑ Rooted submergent ❑ Rooted floating ❑ Free floating ❑ Floating Algae ☒ Attached Algae **dominant species present** Periphyton + algae - attached **Portion of the reach with aquatic vegetation** _____%
WATER QUALITY	**Temperature**_____^{0}C **Specific Conductance**_____ **Dissolved Oxygen** _____ **pH** _____ **Turbidity** _____ **WQ Instrument Used** _____ **Water Odors** ☒ Normal/None ❑ Sewage ❑ Petroleum ❑ Chemical ❑ Fishy ❑ Other_____ **Water Surface Oils** ❑ Slick ❑ Sheen ❑ Globs ❑ Flecks ☒ None ❑ Other_____ **Turbidity (if not measured)** ☒ Clear ❑ Slightly turbid ❑ Turbid ❑ Opaque ❑ Stained ❑ Other_____
SEDIMENT/ SUBSTRATE	**Odors** ☒ Normal ❑ Sewage ❑ Petroleum ❑ Chemical ❑ Anaerobic ❑ None ❑ Other_____ **Oils** ☒ Absent ❑ Slight ❑ Moderate ❑ Profuse **Deposits** ❑ Sludge ❑ Sawdust ❑ Paper fiber ❑ Sand ❑ Relict shells ❑ Other_____ **Looking at stones which are not deeply embedded, are the undersides black in color?** ❑ Yes ☒ No

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)			ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)		
Substrate Type	**Diameter**	**% Composition in Sampling Reach**	**Substrate Type**	**Characteristic**	**% Composition in Sampling Area**
Bedrock			Detritus	sticks, wood, coarse plant materials (CPOM)	
Boulder	> 256 mm (10")				
Cobble	64-256 mm (2.5"-10")		Muck-Mud	black, very fine organic (FPOM)	
Gravel	2-64 mm (0.1"-2.5")				
Sand	0.06-2mm (gritty)		Marl	grey, shell fragments	
Silt	0.004-0.06 mm				
Clay	< 0.004 mm (slick)				

LHL-6 (Pg 2 of 2)

3

Source: Appendix A-1: Habitat Assessment and Physicochemical Characterization Field Data Sheets - Form 1

~~WATER QUALITY AND~~ VEGETATION FIELD DATA SHEET FOR HERRINGTON LAKE

STREAM NAME ~~1-2 MTS~~ Dix River	LOCATION ~~Curtis Inlet~~ MTS Dix River	
STATION # _____ RIVERMILE _____	STREAM CLASS NA	
LAT GPS LONG GPS	RIVER BASIN Herrington Lake - Downstream from dam	
STORET #	AGENCY	
INVESTIGATORS		
FORM COMPLETED BY MTSorensen	DATE 10/02/17 TIME _____ AM PM	REASON FOR SURVEY CAP

WEATHER CONDITIONS

Now		Past 24 hours
☐	storm (heavy rain)	☐
☐	rain (steady rain)	☐
☐	showers (intermittent)	☐
___% ☐	%cloud cover	☐ ___%
~~☒~~	clear/sunny	~~☒~~

Has there been a heavy rain in the last 7 days? ☐ Yes ~~☒~~ No

Air Temperature ____ °C 70s

Other _____

SITE LOCATION/MAP

Dix River

Draw a map of the site and indicate the areas sampled (or attach a photograph)

Sample ID

AV-001-DR-171007

Sample collected from Wadeable area near spillway

STREAM CHARACTERIZATION

Stream Subsystem ☐ Perennial ☐ Intermittent ☐ Tidal

Stream Type ☐ Coldwater ☐ Warmwater

Stream Origin
- ☐ Glacial
- ☐ Non-glacial montane
- ☐ Swamp and bog
- ☐ Spring-fed
- ☐ Mixture of origins
- ☐ Other _____

Catchment Area _____ km²

Weight 31.39

Dix River (Pg 1 of 2)

Source: Rapid Bioassessment Protocols For Use in Streams and Wadeable Rivers: Periphyton, Benthic Macroinvertebrates, and Fish, Second Edition - Form 1

~~WATER QUALITY~~ AND VEGETATION FIELD DATA SHEET

WATERSHED FEATURES
See CAP Maps

Predominant Surrounding Landuse
☐ Forest ☐ Commercial
☐ Field/Pasture ☐ Industrial
☐ Agricultural ☐ Other _____
☐ Residential

Local Watershed NPS Pollution
☐ No evidence ☐ Some potential sources
☐ Obvious sources

Local Watershed Erosion
☐ None ☐ Moderate ☐ Heavy

RIPARIAN VEGETATION (18 meter buffer)

Indicate the dominant type and record the dominant species present
☐ Trees ☐ Shrubs ☐ Grasses ☐ Herbaceous

dominant species present _____

INSTREAM FEATURES
See CAP Maps

Estimated Reach Length _____m

Estimated Stream Width _____m

Sampling Reach Area _____m^2

Area in km^2 (m^2x1000) _____km^2

Estimated Stream Depth _____m

Surface Velocity (at thalweg) _____m/sec

Canopy Cover
☐ Partly open ☐ Partly shaded ☐ Shaded

High Water Mark _____m

Proportion of Reach Represented by Stream Morphology Types
☐ Riffle _____% ☐ Run _____%
☐ Pool _____%

Channelized ☐ Yes ☐ No

Dam Present ☐ Yes ☐ No

LARGE WOODY DEBRIS

LWD _____m^2

Density of LWD _____m^2/km^2 **(LWD/ reach area)**

AQUATIC VEGETATION

Indicate the dominant type and record the dominant species present
☐ Rooted emergent ☐ Rooted submergent ☐ Rooted floating ☐ Free floating
☐ Floating Algae ☒ Attached Algae

dominant species present Periphyton - 100%

Portion of the reach with aquatic vegetation ____%

WATER QUALITY
See Water Quality Sheets / Logbook

Temperature _____ ^{0}C

Specific Conductance _____

Dissolved Oxygen _____

pH _____

Turbidity _____

WQ Instrument Used _____

Water Odors
☒ Normal/None ☐ Sewage
☐ Petroleum ☐ Chemical
☐ Fishy ☐ Other _____

Water Surface Oils
☐ Slick ☐ Sheen ☐ Globs ☐ Flecks
☒ None ☐ Other _____

Turbidity (if not measured)
☒ Clear ☐ Slightly turbid ☐ Turbid
☐ Opaque ☐ Stained ☐ Other _____

SEDIMENT/ SUBSTRATE

Odors
☒ Normal ☐ Sewage ☐ Petroleum
☐ Chemical ☐ Anaerobic ☐ None
☐ Other _____

Oils
☒ Absent ☐ Slight ☐ Moderate ☐ Profuse

Deposits
☐ Sludge ☐ Sawdust ☐ Paper fiber ☐ Sand
☐ Relict shells ☐ Other _____

Looking at stones which are not deeply embedded, are the undersides black in color?
☐ Yes ☒ No

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)			ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)		
Substrate Type	**Diameter**	**% Composition in Sampling Reach**	**Substrate Type**	**Characteristic**	**% Composition in Sampling Area**
Bedrock			Detritus	sticks, wood, coarse plant materials (CPOM)	
Boulder	> 256 mm (10")				
Cobble	64-256 mm (2.5"-10")		Muck-Mud	black, very fine organic (FPOM)	
Gravel	2-64 mm (0.1"-2.5")				
Sand	0.06-2mm (gritty)		Marl	grey, shell fragments	
Silt	0.004-0.06 mm				
Clay	< 0.004 mm (slick)				

Dix River (Pg 2 of 2)

Source: Appendix A-1: Habitat Assessment and Physicochemical Characterization Field Data Sheets - Form 1

APPENDIX D: SAMPLE COLLECTION FIELD DATA SHEETS

Appendix D4: Aquatic Invertebrates Field Data Sheets

3.13
8.47

HERRINGTON LAKE MACROINVERTEBRATE SAMPLING FORM

SITE

HERRINGTON LAKE TRANSECT ID CI-1

DATE Oct 4, 2017 **TIME** 1130

- ☑ Grab sample
- ○ Hester Dendy

FORM COMPLETED BY: AJS / MTSorensen

Sample Volume: NA
5.34 g Weight

OTHER: SampleID AI-001-CI-171004

Depuration Time
24 hrs

WEATHER

Present conditions (check all that apply)

- ○ Heavy Rain
- ○ Overcast
- ○ Steady Rain
- ○ Partly Cloudy
- ○ Intermittent Rain
- ☑ Clear/Sunny

~~Inches of~~ rain in last 24 Hours ?
≠ NO

Other:

OBSERVATIONS

Check all that apply

FLOW

- ○ Dry
- ○ Stagnant/Still
- ○ Low
- ☑ Normal
- ○ High
- ○ Flood over banks

WATER CLARITY

- ○ Clear/Transparent
- ☑ Cloudy/Slightly Turbid
- ○ Opaque/Very Turbid
- ○ Other: at outfall mixing

WATER COLOR

- ○ None
- ○ Brown/Muddy
- ○ Green
- ○ Milky/White
- ○ Tannic/Black
- ☑ Other: Slightly Turbid at outfall mixing

WATER SURFACE

- ○ Clear/Sunny
- ○ Oily sheen that breaks when disturbed
- ○ Oily sheen that does not break when disturbed
- ☑ Some foam (very limited)
- ○ More than 3" foam

Color: Pale Yellow

Color:

WATER ODOR

- ☑ Natural/None
- ○ Fishy
- ○ Sewage
- ○ Gasoline
- ○ Chlorine
- ○ Sulfur
- ○ Other

TAXA GROUPS

MARK THESE TAXA AS X, R, C, or D
X = not found, R (rare)=1-9, C (common)=10-99
and D (dominant)=100 individuals or greater

R	Stonefly Nymphs		Net Spinning Caddisflies	R	Midge Fly Larvae
	Mayfly Nymphs		Dobsonfly/Helgrammite		Black Fly Larvae
	Water Penny Larvae	C	Dragonfly & Damselfly	C	Lunged Snails
	Riffle Beetles		Crayfish		Aquatic Worms
	Aquatic Snipe Flies		Crane Flies	R	Leeches
R	Caddisflies		Aquatic Sow Bugs		
R	Gilled Snails		Scud		
			Clams & Mussels		

Sample weight
~~Wt~~ 14.7 g

HERRINGTON LAKE MACROINVERTEBRATE SAMPLING FORM

SITE

HERRINGTON LAKE TRANSECT ID CI-2

DATE	TIME	
10-05-17		O Grab sample O Hester Dendy
FORM COMPLETED BY: MTSorensen		Sample Volume: 1l9
OTHER: Sample ID-A1-001-C12-171005		Depuration Time 24 hrs

WEATHER

Present conditions (check all that apply)

- O Heavy Rain
- O Overcast
- O Steady Rain
- O Partly Cloudy
- O Intermittent Rain
- ✓ Clear/Sunny

~~Inches of~~ rain in last 24 Hours ? NO

Other:

OBSERVATIONS

Check all that apply

FLOW	WATER CLARITY	WATER COLOR
O Dry	✓ Clear/Transparent	✓ None
O Stagnant/Still	O Cloudy/Slightly Turbid	O Brown/Muddy
O Low	O Opaque/Very Turbid	O Green
✓ Normal	O Other:	O Milky/White
O High		O Tannic/Black
O Flood over banks		O Other:

WATER SURFACE

- ✓ Clear/Sunny
- O Oily sheen that breaks when disturbed
- O Oily sheen that does not break when disturbed
- O Some foam — Color
- O More than 3" foam — Color

WATER ODOR

✓ Natural/None	O Gasoline	O Other
O Fishy	O Chlorine	
O Sewage	O Sulfur	

TAXA GROUPS

MARK THESE TAXA AS X, R, C, or D

X = not found, R (rare)=1-9, C (common)=10-99 and D (dominant)=100 individuals or greater

Stonefly Nymphs	Net Spinning Caddisflies	Midge Fly Larvae
Mayfly Nymphs	Dobsonfly/Helgrammite	Black Fly Larvae
Water Penny Larvae	Dragonfly & Damselfly	Lunged Snails
Riffle Beetles	R Crayfish (2)	Aquatic Worms
Aquatic Snipe Flies	Crane Flies	Leeches
Caddisflies	Aquatic Sow Bugs	
Gilled Snails	Scud	
	Clams & Mussels	

Weigat 1lg

HERRINGTON LAKE MACROINVERTEBRATE SAMPLING FORM

SITE

HERRINGTON LAKE TRANSECT ID C13

DATE	**TIME**	
10-05-17		~~O~~ Grab sample O Hester Dendy
FORM COMPLETED BY: MTSorensen		Sample Volume: 28.479
OTHER: Sample ID - AI-001-C13-171005		Depuration Time 24 hrs

WEATHER

Present conditions (check all that apply)

- O Heavy Rain
- O Overcast
- O Steady Rain
- O Partly Cloudy
- O Intermittent Rain
- O Clear/Sunny

~~Inches of~~ rain in last 24 Hours ? No

Other:

OBSERVATIONS

Check all that apply

FLOW	WATER CLARITY	WATER COLOR
O Dry	~~O~~ Clear/Transparent	~~O~~ None
O Stagnant/Still	O Cloudy/Slightly Turbid	O Brown/Muddy
O Low	O Opaque/Very Turbid	O Green
~~O~~ Normal	O Other:	O Milky/White
O High		O Tannic/Black
O Flood over banks		O Other:

WATER SURFACE

- ~~O~~ Clear~~/Sunny~~
- O Oily sheen that breaks when disturbed
- O Oily sheen that does not break when disturbed
- O Some foam — Color
- O More than 3" foam — Color

WATER ODOR

~~O~~ Natural/None	O Gasoline	O Other
O Fishy	O Chlorine	
O Sewage	O Sulfur	

TAXA GROUPS

MARK THESE TAXA AS X, R, C, or D

X = not found, R (rare)=1-9, C (common)=10-99 and D (dominant)=100 individuals or greater

Stonefly Nymphs	Net Spinning Caddisflies	Midge Fly Larvae
C Mayfly Nymphs (160)	Dobsonfly/Helgrammite	Black Fly Larvae
Water Penny Larvae	Dragonfly & Damselfly	Lunged Snails
Riffle Beetles	R Crayfish (4)	Aquatic Worms
Aquatic Snipe Flies	Crane Flies	Leeches
Caddisflies	Aquatic Sow Bugs	
C Gilled Snails (13)	Scud	
	Clams & ~~Mussels~~	

HERRINGTON LAKE MACROINVERTEBRATE SAMPLING FORM

SITE

HERRINGTON LAKE TRANSECT ID: C14

DATE: 10-05-17

TIME:

- Ø Grab sample
- O Hester Dendy

FORM COMPLETED BY: MT Sorensen

Sample Volume: 14.49

OTHER: Sample ID - A1-001-C14-171005

Depuration Time: 24 hrs

WEATHER

Present conditions (check all that apply)

- O Heavy Rain
- O Overcast
- O Steady Rain
- O Partly Cloudy
- O Intermittent Rain
- Ø Clear/Sunny

Inches of rain in last 24 Hours: NO

Other:

OBSERVATIONS

Check all that apply

FLOW

- O Dry
- O Stagnant/Still
- O Low
- Ø Normal
- O High
- O Flood over banks

WATER CLARITY

- Ø Clear/Transparent
- O Cloudy/Slightly Turbid
- O Opaque/Very Turbid
- O Other:

WATER COLOR

- Ø None
- O Brown/Muddy
- O Green
- O Milky/White
- O Tannic/Black
- O Other:

WATER SURFACE

- Ø Clear/Sunny
- O Oily sheen that breaks when disturbed
- O Oily sheen that does not break when disturbed
- O Some foam
- O More than 3" foam

Color:

Color:

WATER ODOR

- Ø Natural/None
- O Fishy
- O Sewage
- O Gasoline
- O Chlorine
- O Sulfur
- O Other

TAXA GROUPS

MARK THESE TAXA AS X, R, C, or D

X = not found, R (rare)=1-9, C (common)=10-99 and D (dominant)=100 individuals or greater

- [ ] Stonefly Nymphs
- [ ] Mayfly Nymphs
- [ ] Water Penny Larvae
- [ ] Riffle Beetles
- [ ] Aquatic Snipe Flies
- [ ] Caddisflies
- [ ] Gilled Snails
- [ ] Net Spinning Caddisflies
- [ ] Dobsonfly/Helgrammite
- [ ] Dragonfly & Damselfly
- [R] Crayfish (2)
- [ ] Crane Flies
- [ ] Aquatic Sow Bugs
- [ ] Scud
- [ ] Clams & Mussels
- [ ] Midge Fly Larvae
- [ ] Black Fly Larvae
- [ ] Lunged Snails
- [ ] Aquatic Worms
- [ ] Leeches

HERRINGTON LAKE MACROINVERTEBRATE SAMPLING FORM

SITE

HERRINGTON LAKE TRANSECT ID: HQ INLET

DATE	TIME	
10-6-17		⊘ Grab sample O Hester Dendy
FORM COMPLETED BY: Kleigh / MT Sorensen		Sample Volume: 1l9
OTHER: Sample ID AV-001-~~EIZ-171005~~ HQ-171006		Depuration Time 24 hrs

WEATHER

Present conditions (check all that apply)

- O Heavy Rain
- O Overcast
- O Steady Rain
- O Partly Cloudy
- O Intermittent Rain
- ⊘ Clear/Sunny

Inches of rain in last 24 Hours:

Other:

OBSERVATIONS

Check all that apply

FLOW

- O Dry
- O Stagnant/Still
- O Low
- ⊘ Normal
- O High
- O Flood over banks

WATER CLARITY

- ⊘ Clear/Transparent
- O Cloudy/Slightly Turbid
- O Opaque/Very Turbid
- O Other:

WATER COLOR

- ⊘ None
- O Brown/Muddy
- O Green
- O Milky/White
- O Tannic/Black
- O Other:

WATER SURFACE

- ⊘ ~~Clear/Sunny~~ MTS
- O Oily sheen that breaks when disturbed
- O Oily sheen that does not break when disturbed
- O Some foam — Color
- O More than 3" foam — Color

WATER ODOR

- ⊘ ~~Natural/None~~
- O Fishy
- O Sewage
- O Gasoline
- O Chlorine
- O Sulfur
- O Other

TAXA GROUPS

MARK THESE TAXA AS X, R, C, or D

X = not found, R (rare)=1-9, C (common)=10-99 and D (dominant)=100 individuals or greater

	Stonefly Nymphs		Net Spinning Caddisflies	R	Midge Fly Larvae
C	Mayfly Nymphs		Dobsonfly/Helgrammite		Black Fly Larvae
	Water Penny Larvae	R	Dragonfly & Damselfly		Lunged Snails
	Riffle Beetles		Crayfish		Aquatic Worms
	Aquatic Snipe Flies		Crane Flies		Leeches
	Caddisflies		Aquatic Sow Bugs		
C	Gilled Snails		Scud		
			Clams & Mussels		

Sample Weight 119

HERRINGTON LAKE MACROINVERTEBRATE SAMPLING FORM

SITE

HERRINGTON LAKE TRANSECT ID LHL1

DATE	TIME	
10-12-17	9:30	☑ Grab sample O Hester Dendy
FORM COMPLETED BY: BG		Sample Volume: 28.29
OTHER: Sample ID AI-001-LHL1-171012		Depuration Time 24 hrs

WEATHER

Present conditions (check all that apply)

- O Heavy Rain
- ☑ Overcast
- O Steady Rain
- O Partly Cloudy
- O Intermittent Rain
- O Clear/Sunny

~~Inches of~~ rain in last 24 Hours ? Yes

Other:

OBSERVATIONS

Check all that apply

FLOW

- O Dry
- O Stagnant/Still
- O Low
- ☑ Normal
- O High
- O Flood over banks

WATER CLARITY

- ☑ Clear/Transparent
- O Cloudy/Slightly Turbid
- O Opaque/Very Turbid
- O Other:

WATER COLOR

- ☑ None
- O Brown/Muddy
- O Green
- O Milky/White
- O Tannic/Black
- O Other:

WATER SURFACE

- ☑ Clear/~~Sunny~~
- O Oily sheen that breaks when disturbed
- O Oily sheen that does not break when disturbed
- O Some foam — Color
- O More than 3" foam — Color

WATER ODOR

- ☑ Natural/None
- O Fishy
- O Sewage
- O Gasoline
- O Chlorine
- O Sulfur
- O Other

TAXA GROUPS

MARK THESE TAXA AS X, R, C, or D
X = not found, R (rare)=1-9, C (common)=10-99
and D (dominant)=100 individuals or greater

[ ] Stonefly Nymphs	[ ] Net Spinning Caddisflies	[ ] Midge Fly Larvae
[R] Mayfly Nymphs (2)	[ ] Dobsonfly/Helgrammite	[ ] Black Fly Larvae
[ ] Water Penny Larvae	[ ] Dragonfly & Damselfly	[ ] Lunged Snails
[ ] Riffle Beetles	[R] Crayfish (4)	[ ] Aquatic Worms
[ ] Aquatic Snipe Flies	[ ] Crane Flies	[ ] Leeches
[ ] Caddisflies	[ ] Aquatic Sow Bugs	
[C] Gilled Snails (15)	[ ] Scud	Weight 28.29
	[ ] Clams ~~& Mussels~~	

HERRINGTON LAKE MACROINVERTEBRATE SAMPLING FORM

SITE

HERRINGTON LAKE TRANSECT ID LHL2

DATE	TIME	
10-12-17	1100	⊘ Grab sample O Hester Dendy
FORM COMPLETED BY: FMW / MTSorensen		Sample Volume: 8.19
OTHER: Sample ID - AI-001-LHL2-171012		Depuration Time

WEATHER

Present conditions (check all that apply)

- O Heavy Rain
- ⊘ Overcast
- O Steady Rain
- O Partly Cloudy
- O Intermittent Rain
- O Clear/Sunny

Inches of rain in last 24 Hours ?

Yes

Other:

OBSERVATIONS

Check all that apply

FLOW	WATER CLARITY	WATER COLOR
O Dry	⊘ Clear/Transparent	⊘ None
O Stagnant/Still	O Cloudy/Slightly Turbid	O Brown/Muddy
O Low	O Opaque/Very Turbid	O Green
⊘ Normal	O Other:	O Milky/White
O High		O Tannic/Black
O Flood over banks		O Other:

WATER SURFACE

- ⊘ Clear/~~Sunny~~
- O Oily sheen that breaks when disturbed
- O Oily sheen that does not break when disturbed
- O Some foam — Color
- O More than 3" foam — Color

WATER ODOR

⊘ Natural/None	O Gasoline	O Other
O Fishy	O Chlorine	
O Sewage	O Sulfur	

TAXA GROUPS

MARK THESE TAXA AS X, R, C, or D
X = not found, R (rare)=1-9, C (common)=10-99
and D (dominant)=100 individuals or greater

[ ] Stonefly Nymphs	[ ] Net Spinning Caddisflies	[ ] Midge Fly Larvae
[C] Mayfly Nymphs	[ ] Dobsonfly/Helgrammite	[ ] Black Fly Larvae
[ ] Water Penny Larvae	[ ] Dragonfly & Damselfly	[ ] Lunged Snails
[ ] Riffle Beetles	[R] Crayfish (2)	[R] Aquatic Worms
[ ] Aquatic Snipe Flies	[ ] Crane Flies	[R] Leeches
[ ] Caddisflies	[ ] Aquatic Sow Bugs	
[R] Gilled Snails	[ ] Scud	
	[ ] Clams & ~~Mussels~~	

Weight 8.19

HERRINGTON LAKE MACROINVERTEBRATE SAMPLING FORM

SITE

HERRINGTON LAKE TRANSECT ID: LHL3

DATE	TIME	
10-12-17	1230	⊙ Grab sample O Hester Dendy
FORM COMPLETED BY: FMW / MTSorensen		Sample Volume: 23.69
OTHER: Sample ID - A1-001-LHL3		Depuration Time: 24 hrs

WEATHER

Present conditions (check all that apply)

- O Heavy Rain
- ⊙ Overcast
- O Steady Rain
- O Partly Cloudy
- O Intermittent Rain
- O Clear/Sunny

~~Inches of~~ rain in last 24 Hours? Yes

Other:

OBSERVATIONS

Check all that apply

FLOW

- O Dry
- O Stagnant/Still
- O Low
- ⊙ Normal
- O High
- O Flood over banks

WATER CLARITY

- ⊙ Clear/Transparent
- O Cloudy/Slightly Turbid
- O Opaque/Very Turbid
- O Other:

WATER COLOR

- ⊙ None
- O Brown/Muddy
- O Green
- O Milky/White
- O Tannic/Black
- O Other:

WATER SURFACE

- ⊙ Clear/~~Sunny~~ MTS
- O Oily sheen that breaks when disturbed
- O Oily sheen that does not break when disturbed
- O Some foam — Color
- O More than 3" foam — Color

WATER ODOR

- ⊙ Natural/None
- O Fishy
- O Sewage
- O Gasoline
- O Chlorine
- O Sulfur
- O Other

TAXA GROUPS

MARK THESE TAXA AS X, R, C, or D

X = not found, R (rare)=1-9, C (common)=10-99 and D (dominant)=100 individuals or greater

R	Stonefly Nymphs		Net Spinning Caddisflies		Midge Fly Larvae
C	Mayfly Nymphs		Dobsonfly/Helgrammite		Black Fly Larvae
	Water Penny Larvae		Dragonfly & Damselfly		Lunged Snails
	Riffle Beetles	R	Crayfish (2)		Aquatic Worms
	Aquatic Snipe Flies		Crane Flies		Leeches
	Caddisflies		Aquatic Sow Bugs		
R	Gilled Snails		Scud		
			Clams & ~~Mussels~~		

Weight - 23.6 g

HERRINGTON LAKE MACROINVERTEBRATE SAMPLING FORM

SITE

HERRINGTON LAKE TRANSECT ID LHL4

DATE	TIME	
10-12-17	1330	☑ Grab sample O Hester Dendy
FORM COMPLETED BY: BG		Sample Volume: 25.69
OTHER: Sample ID A1-001-171012		Depuration Time 24hrs

WEATHER

Present conditions (check all that apply)

- O Heavy Rain
- ☑ Overcast
- O Steady Rain
- O Partly Cloudy
- O Intermittent Rain
- O Clear/Sunny

Inches of rain in last 24 Hours ~~Rain in last 24 hrs?~~ Yes

Other:

OBSERVATIONS

Check all that apply

FLOW

- O Dry
- O Stagnant/Still
- O Low
- ☑ Normal
- O High
- O Flood over banks

WATER CLARITY

- ☑ Clear/Transparent
- O Cloudy/Slightly Turbid
- O Opaque/Very Turbid
- O Other:

WATER COLOR

- ☑ None
- O Brown/Muddy
- O Green
- O Milky/White
- O Tannic/Black
- O Other:

WATER SURFACE

- ☑ Clear/~~Sunny~~
- O Oily sheen that breaks when disturbed
- O Oily sheen that does not break when disturbed
- O Some foam — Color
- O More than 3" foam — Color

WATER ODOR

- ☑ Natural/None
- O Fishy
- O Sewage
- O Gasoline
- O Chlorine
- O Sulfur
- O Other

TAXA GROUPS

MARK THESE TAXA AS X, R, C, or D
X = not found, R (rare)=1-9, C (common)=10-99
and D (dominant)=100 individuals or greater

[ ] Stonefly Nymphs	[ ] Net Spinning Caddisflies	[ ] Midge Fly Larvae
[C] Mayfly Nymphs (35)	[ ] Dobsonfly/Helgrammite	[ ] Black Fly Larvae
[ ] Water Penny Larvae	[ ] Dragonfly & Damselfly	[ ] Lunged Snails
[ ] Riffle Beetles	[R] Crayfish (2)	[ ] Aquatic Worms
[ ] Aquatic Snipe Flies	[ ] Crane Flies	[ ] Leeches
[ ] Caddisflies	[ ] Aquatic Sow Bugs	
[ ] Gilled Snails	[ ] Scud	
	[ ] Clams ~~& Mussels~~	

Weight 25.6g

HERRINGTON LAKE MACROINVERTEBRATE SAMPLING FORM

SITE

HERRINGTON LAKE TRANSECT ID: LHL5

DATE	TIME	
10-12-17	1530	☑ Grab sample O Hester Dendy
FORM COMPLETED BY: BG		Sample Volume: Weight 7.95 g
OTHER:		Depuration Time

WEATHER

Present conditions (check all that apply)

- O Heavy Rain
- ☑ Overcast
- O Steady Rain
- O Partly Cloudy
- O Intermittent Rain
- O Clear/Sunny

~~Inches of~~ rain in last 24 Hours? Yes

Other:

OBSERVATIONS

Check all that apply

FLOW

- O Dry
- O Stagnant/Still
- O Low
- ☑ Normal
- O High
- O Flood over banks

WATER CLARITY

- ☑ Clear/Transparent
- O Cloudy/Slightly Turbid
- O Opaque/Very Turbid
- O Other:

WATER COLOR

- ☑ None
- O Brown/Muddy
- O Green
- O Milky/White
- O Tannic/Black
- O Other:

WATER SURFACE

- ☑ Clear/~~Sunny~~
- O Oily sheen that breaks when disturbed
- O Oily sheen that does not break when disturbed
- O Some foam — Color
- O More than 3" foam — Color

WATER ODOR

- ☑ Natural/None
- O Fishy
- O Sewage
- O Gasoline
- O Chlorine
- O Sulfur
- O Other

TAXA GROUPS

MARK THESE TAXA AS X, R, C, or D

X = not found, R (rare)=1-9, C (common)=10-99 and D (dominant)=100 individuals or greater

	Stonefly Nymphs	Net Spinning Caddisflies
C	Mayfly Nymphs (~~70~~ 170)	Dobsonfly/Helgrammite
	Water Penny Larvae	Dragonfly & Damselfly
	Riffle Beetles	R Crayfish (2)
	Aquatic Snipe Flies	Crane Flies
	Caddisflies (100)	Aquatic Sow Bugs
	Gilled Snails	Scud
		Clams & Mussels
	Midge Fly Larvae	
	Black Fly Larvae	
	Lunged Snails	
	Aquatic Worms	
	Leeches	

Weight 7.95 g

HERRINGTON LAKE MACROINVERTEBRATE SAMPLING FORM

SITE

HERRINGTON LAKE TRANSECT ID LHL6

DATE	TIME	
10-12-17	1620	⊘ Grab sample O Hester Dendy
FORM COMPLETED BY: FMW		Sample Volume: 18.5g
OTHER: Sample ID - OA1-001-LHL6-171012		Depuration Time 24 hrs

WEATHER

Present conditions (check all that apply)

- O Heavy Rain
- ⊘ Overcast
- O Steady Rain
- O Partly Cloudy
- O Intermittent Rain
- O Clear/Sunny

~~Inches of~~ rain in last 24 Hours: Yes

Other:

OBSERVATIONS

Check all that apply

FLOW

- O Dry
- O Stagnant/Still
- O Low
- ⊘ Normal
- O High
- O Flood over banks

WATER CLARITY

- ⊘ Clear/Transparent
- O Cloudy/Slightly Turbid
- O Opaque/Very Turbid
- O Other:

WATER COLOR

- ⊘ None
- O Brown/Muddy
- O Green
- O Milky/White
- O Tannic/Black
- O Other:

WATER SURFACE

- ⊘ ~~Clear/Sunny~~
- O Oily sheen that breaks when disturbed
- O Oily sheen that does not break when disturbed
- O Some foam — Color
- O More than 3" foam — Color

WATER ODOR

- ⊘ Natural/None
- O Fishy
- O Sewage
- O Gasoline
- O Chlorine
- O Sulfur
- O Other

TAXA GROUPS

MARK THESE TAXA AS X, R, C, or D

X = not found, R (rare)=1-9, C (common)=10-99 and D (dominant)=100 individuals or greater

	Stonefly Nymphs		Net Spinning Caddisflies		Midge Fly Larvae
D	Mayfly Nymphs (120)	R	Dobsonfly/Helgrammite (2)		Black Fly Larvae
	Water Penny Larvae		Dragonfly & Damselfly		Lunged Snails
	Riffle Beetles	R	Crayfish (1)		Aquatic Worms
	Aquatic Snipe Flies		Crane Flies		Leeches
	Caddisflies		Aquatic Sow Bugs		
R	Gilled Snails (3)		Scud		
			Clams ~~& Mussels~~		

Weight 18.5g

HERRINGTON LAKE MACROINVERTEBRATE SAMPLING FORM

SITE

HERRINGTON LAKE TRANSECT ID: DIX ~~RUD~~ River

DATE	TIME	
10-7-17		O Grab sample O Hester Dendy
FORM COMPLETED BY: MTSorensen / BG		Sample Volume: 10.96g
OTHER: Sample ID-A1-001-DR-171007		Depuration Time 24hrs

WEATHER

Present conditions (check all that apply)

- O Heavy Rain
- O Overcast
- O Steady Rain
- O Partly Cloudy
- O Intermittent Rain
- Ø ~~Clear/Sunny~~

~~Inches of~~ rain in last 24 Hours ? No

Other:

OBSERVATIONS

Check all that apply

FLOW	WATER CLARITY	WATER COLOR
O Dry	Ø ~~Clear/Transparent~~	Ø ~~None~~
O Stagnant/Still	O Cloudy/Slightly Turbid	O Brown/Muddy
O Low	O Opaque/Very Turbid	O Green
Ø ~~Normal~~	O Other:	O Milky/White
O High		O Tannic/Black
O Flood over banks		O Other:

WATER SURFACE

Ø ~~Clear/Sunny~~

- O Oily sheen that breaks when disturbed
- O Oily sheen that does not break when disturbed
- O Some foam — Color
- O More than 3" foam — Color

WATER ODOR

Ø ~~Natural/None~~	O Gasoline	O Other
O Fishy	O Chlorine	
O Sewage	O Sulfur	

TAXA GROUPS

MARK THESE TAXA AS X, R, C, or D
X = not found, R (rare)=1-9, C (common)=10-99
and D (dominant)=100 individuals or greater

Stonefly Nymphs	Net Spinning Caddisflies	Midge Fly Larvae
Mayfly Nymphs	Dobsonfly/Helgrammite	Black Fly Larvae
Water Penny Larvae	Dragonfly & Damselfly	R Lunged Snails
Riffle Beetles	Crayfish	Aquatic Worms
Aquatic Snipe Flies	Crane Flies	R Leeches
Caddisflies	R Aquatic Sow Bugs	
Gilled Snails	R Scud	
	Clams & Mussels	

Weight 10.96g

APPENDIX E: KENTUCKY ENVIRONMENTAL SERVICES BRANCH SPLIT SAMPLE SELENIUM WHOLE BODY TISSUE CALCULATION

Table E1: Calculation of Bluegill Selenium Fish Whole Body Fish Tissue Concentration
EW Station Phase I Technical Memorandum Herrington Lake
Mercer County, Kentucky

Sample ID	Portion	CAS Number	Constituent	Basis	Selenium in mg/kg (C_F and C_R)	Weight of portion (W_F and W_R) grams	Weight (W_{WB}) grams	Selenium Whole Body Fish Concentration (WBFC) mg/kg wet weight (WW) Using Equation 1
Phase I Sample - WET WEIGHT								
FF-001(BG)-CI-171004	Fillet	7782-49-2	Selenium	Wet	1.85	75.991	209.753	1.74
FWB-001(BG)-CI-171004	Carcass	7782-49-2	Selenium	Wet	1.68	133.762		
Phase I Sample Duplicate - WET WEIGHT								
FF-001(BG)-CI-171004-FD	Fillet	7782-49-2	Selenium	Wet	2.15	75.991	209.753	2.00
FWB-001(BG)-CI-171004-F	Carcass	7782-49-2	Selenium	Wet	1.91	133.762		
Kentucky ESB Split Sample - WET WEIGHT								
FF-001(BG)-CI-171004	Fillet	7782-49-2	Selenium	Wet	2.19	75.991	209.753	2.08
FWB-001(BG)-CI-171004	Carcass	7782-49-2	Selenium	Wet	2.01	133.762		
Phase I Sample - DRY WEIGHT								
FF-001(BG)-CI-171004	Fillet	7782-49-2	Selenium	Dry	8.91	75.991	209.753	6.47
FWB-001(BG)-CI-171004	Carcass	7782-49-2	Selenium	Dry	5.08	133.762		
Phase I Sample - DRY WEIGHT								
FF-001(BG)-CI-171004-FD	Fillet	7782-49-2	Selenium	Dry	10.2	75.991	209.753	7.38
FWB-001(BG)-CI-171004-F	Carcass	7782-49-2	Selenium	Dry	5.78	133.762		

Kentucky ESB Split Sample - DRY WEIGHT	Portion	% Moisture (Ramboll Data)	Selenium in mg/kg ww (C_F and C_R)	Selenium in mg/kg dw (C_F and C_R)	Weight of portion (W_F and W_R) grams	Weight (W_{WB}) grams	Selenium Whole Body Fish Concentration (WBFC) mg/kg wet weight (WW) Using Equation 1
FF-001(BG)-CI-171004	Fillet	79.2	2.19	10.53	75.991	209.753	7.69
FWB-001(BG)-CI-171004	Carcass	66.9	2.01	6.07	133.762		

Table E1: Calculation of Bluegill Selenium Fish Whole Body Fish Tissue Concentration
EW Station Phase I Technical Memorandum Herrington Lake
Mercer County, Kentucky

Section 5.1.1 of the Phase I Technical Memorandum shows the equation used to calculate whole body fish tissue concentrations for bluegill:

WBFC = ([WF/ (WF + WR)] * CF) + ([WR/ (WF + WR)] * CR)

Where:

WBFC = Whole body fish chemical concentration (mg/kg)
Wf = Weight of fish fillet (g)
Wr = Weight of fish remains or carcass (g)
Cf = Chemical concentration in fish fillet composite sample (mg/kg)
Cr = Chemical concentration in remains composite sample (mg/kg)

% Solids	100-% moisture
Dry Weigh	Concentration in Wet Weight/(1-% solids)
ESB	Kentucky Environmental Services Branch
mg/kg DW	Miligrams per kilogram dry weight
mg/kg WW	Miligrams per kilogram wet weight
W_{WB}	Weight of Whole body (Wf+Wr)

Table E2: Comparison of Kentucky Environmental Services Branch and Phase I Fish Tissue Sample Results
EW Station Phase I Technical Memorandum Herrington Lake
Mercer County, Kentucky

Portion	CAS Number	Constituent	KY ESB Result (mg/kg WW)	Phase I Sample Result (mg/kg WW)	% Difference
Fillet	7440-38-2	Arsenic, total	0.103	0.08	22
Fillet	7440-43-9	Cadmium	<0.0186	0.0084	NA
Fillet	7782-49-2	Selenium	2.19	1.85	16
Fillet	7440-66-6	Zinc	9.76	7.45	24
Carcass	7440-38-2	Arsenic, total	0.302	0.24	21
Carcass	7440-43-9	Cadmium	0.125	0.105	16
Carcass	7782-49-2	Selenium	2.01	1.68	16
Carcass	7440-66-6	Zinc	40.2	27.9	31

KY ESB Kentucky Environmental Services Branch
mg/kg ww Miligrams per kilogram wet weight

MATTHEW G. BEVIN
GOVERNOR

CHARLES G. SNAVELY
SECRETARY

ENERGY AND ENVIRONMENT CABINET
DEPARTMENT FOR ENVIRONMENTAL PROTECTION

AARON B. KEATLEY
COMMISSIONER

100 SOWER BOULEVARD, STE. 104
FRANKFORT, KENTUCKY 40601

Friday, March 23, 2018

Lab Sample Number: AP00581
To: Division of Water
300 Sower Blvd
Frankfort, KY 40601
ATTN: Andrea Keatlev
County: Mercer
Collected By: Ramboll Environ
Delivered By: FedEx
Received By: Jennifer Clark
Sample Matrix: FISH-FILLET
Sample Description: K17-12350
Sample ID: 008

Station/Project ID:
Re: EW Brown Fish Tissue Monitoring

Program Code: A10
AKGWA:
Facility:
Date: 10/03/2017 **Time:** 10:00
Date: 03/08/2018 **Time:** 10:35
Date: 03/08/2018 **Time:** 10:35
Collection Method: Grab
Sample Type: Field Sample
Container ID:
Shipment Temp: 0.8C

REPORT OF ANALYSIS

LAB ACODE	CAS NUM	CONSTITUENTS	RESULT	UNIT	LOQ	LOD	FLAG
$3130T_CALC	7429-90-5	Aluminum	Not detected	mg/Kg AR	1.86	0.929	U
$3130T_CALC	7440-38-2	Arsenic	0.103	mg/Kg AR	0.0465	0.0186	
$3130T_CALC	7440-41-7	Beryllium	Not detected	mg/Kg AR	0.0465	0.0186	U
$3130T_CALC	7440-43-9	Cadmium	Not detected	mg/Kg AR	0.0465	0.0186	U
$3130T_CALC	7440-47-3	Chromium	0.824	mg/Kg AR	0.0465	0.0186	
$3130T_CALC	7440-50-8	Copper	Not detected	mg/Kg AR	0.0930	0.0465	QU
$3130T_CALC	7439-92-1	Lead	Not detected	mg/Kg AR	0.0465	0.0186	U
$3130T_CALC	7439-96-5	Manganese	1.11	mg/Kg AR	0.0465	0.0186	V
$3130T_CALC	7440-02-0	Nickel	0.522	mg/Kg AR	0.0930	0.0465	
$3130T_CALC	7782-49-2	Selenium	2.19	mg/Kg AR	0.0465	0.0186	
$3130T_CALC	7440-62-2	Vanadium	0.0436	mg/Kg AR	0.0465	0.0186	J
$3130T_CALC	7440-66-6	Zinc	9.76	mg/Kg AR	0.930	0.465	

Container Preservation Status at Sample Login

@G-4OZF Glass 4 oz widemouth jar -frozen pH not tested

Data Quality Flag Description
J = Estimated Value
Q = QC Limits Exceeded
U = Analyte Not Detected
V = Calibration Verification Limits Exceeded

Unit Description
AR = Analyzed on an "As Received" Weight Basis

Case Narrative

Copper (Cu) is Q flagged for this sample analysis ($3130T) due to it not meeting the method limits in regard to the calibration for this indivdual metal.

This report has been prepared and reviewed by personnel within the Environmental Services Branch (ESB) and has been approved for release.

Original report is on file at ESB

Michael Goss, Branch Manager

Report Format: DESFinal

MATTHEW G. BEVIN
GOVERNOR

CHARLES G. SNAVELY
SECRETARY

ENERGY AND ENVIRONMENT CABINET
DEPARTMENT FOR ENVIRONMENTAL PROTECTION

AARON B. KEATLEY
COMMISSIONER

100 SOWER BOULEVARD, STE. 104
FRANKFORT, KENTUCKY 40601

Friday, March 23, 2018

Lab Sample Number: AP00582
To: Division of Water
300 Sower Blvd
Frankfort, KY 40601
ATTN: Andrea Keatlev
County: Mercer
Collected By: Ramboll Environ
Delivered By: FedEx
Received By: Jennifer Clark
Sample Matrix: FISH-OFFAL
Sample Description: K17-12350
Sample ID: 009

Station/Project ID:
Re: EW Brown Fish Tissue Monitoring

Program Code: A10
AKGWA:
Facility:
Date: 10/03/2017 **Time:** 10:00
Date: 03/08/2018 **Time:** 10:35
Date: 03/08/2018 **Time:** 10:35
Collection Method: Grab
Sample Type: Field Sample
Container ID:
Shipment Temp: 0.8C

REPORT OF ANALYSIS

LAB ACODE	CAS NUM	CONSTITUENTS	RESULT	UNIT	LOQ	LOD	FLAG
$3130T_CALC	7429-90-5	Aluminum	27.8	mg/Kg AR	1.65	0.826	
$3130T_CALC	7440-38-2	Arsenic	0.302	mg/Kg AR	0.0412	0.0165	
$3130T_CALC	7440-41-7	Beryllium	Not detected	mg/Kg AR	0.0412	0.0165	U
$3130T_CALC	7440-43-9	Cadmium	0.125	mg/Kg AR	0.0412	0.0165	
$3130T_CALC	7440-47-3	Chromium	0.263	mg/Kg AR	0.0412	0.0165	
$3130T_CALC	7440-50-8	Copper	0.564	mg/Kg AR	0.0826	0.0413	Q
$3130T_CALC	7439-92-1	Lead	0.0540	mg/Kg AR	0.0412	0.0165	
$3130T_CALC	7439-96-5	Manganese	56.3	mg/Kg AR	0.0412	0.0165	V
$3130T_CALC	7440-02-0	Nickel	0.332	mg/Kg AR	0.0826	0.0413	
$3130T_CALC	7782-49-2	Selenium	2.01	mg/Kg AR	0.0412	0.0165	
$3130T_CALC	7440-62-2	Vanadium	0.604	mg/Kg AR	0.0412	0.0165	
$3130T_CALC	7440-66-6	Zinc	40.2	mg/Kg AR	0.826	0.413	

Container Preservation Status at Sample Login

@G-4OZF Glass 4 oz widemouth jar -frozen pH not tested

Data Quality Flag Description
Q = QC Limits Exceeded
U = Analyte Not Detected
V = Calibration Verification Limits Exceeded

Unit Description
AR = Analyzed on an "As Received" Weight Basis

Case Narrative

Copper (Cu) is Q flagged for this sample analysis ($3130T) due to it not meeting the method limits in regard to the calibration for this indivdual metal.

This report has been prepared and reviewed by personnel within the Environmental Services Branch (ESB) and has been approved for release.

Original report is on file at ESB

Michael Goss, Branch Manager

Report Format: DESFinal