October 21, 2022

Mr. David A. Stilwell
Field Supervisor, New York Field Office
U.S. Fish and Wildlife Service
3817 Looker Road Cortland, New York 13045

Re: Report for Freshwater Mussel Monitoring on the Allegheny River
Cattaraugus County, New York
NYSDEC Spill Number 0650800

Dear Mr. Stilwell:

On behalf of ExxonMobil Environmental and Property Solutions (ExxonMobil), Roux Environmental Engineering and Geology, D.P.C. and Roux Associates, Inc. (collectively "Roux"), is providing the Freshwater Mussel Monitoring report (Monitoring Report) which summarizes the final monitoring event performed as part of the environmental remediation response actions associated with NYSDEC Spill Number 0650800, located within a portion of the Allegheny River in the vicinity of South 7th Street and West Green Street in Olean, New York (the "Site").

The Monitoring Report, included as **Attachment 1**, was prepared by EnviroScience, Inc. (EnviroScience), a qualified and permitted biological firm that possesses all necessary state and federal permits to handle common and protected mussel species in the Allegheny River. Protected species found in the project area include the wavyrayed lampmussel (*Lampsilis Fasciola*), which is listed as threatened in the State of New York, and the Northern riffleshell (*Epioblasma rangiana)*, and Rayed bean (*Villosa fabalis),* two federally endangered species.

This letter and the Monitoring Report are being submitted to the U.S. Fish and Wildlife Service (USFWS), New York State Department of Environmental Conservation (NYSDEC), and US Army Corps of Engineers (USACE) in compliance with Condition 5 of the Revised Biological Opinion (BO) dated August 11, 2020. Transmittal of this letter and its attachments serves to inform the USFWS that all monitoring and reporting requirements dictated by the BO have been met and no future monitoring activities are planned.

Significant findings detailed in the Monitoring Report include the following:

- Survivorship of mussels within the Indirect Effects Action Area is estimated at 89%, resulting in a mortality rate of 11%, which is comparable to the mortality rates observed within the Direct Effects Action Area from short-term and long-term monitoring events in previous years. Short-term (<25%) and long-term (<50%) mortality rates established in the BO.
- High survivability rates indicate habitat restoration post remedial activities posed no adverse effects to the state and federally endangered mussel population within the Indirect Effects Action Area.

ExxonMobil and Roux appreciate the efforts of all parties involved. Should USFWS, USACE, or NYSDEC require any additional information pertaining to the monitoring report transmitted by this letter, Roux and EnviroScience will submit them as requested.

Sincerely,

ROUX ASSOCIATES, INC.

Sara Barrientos
Project Geologist

Ian Reed
Vice President / Principal Hydrogeologist

Attachments

cc: Elizabeth E. Zinkevicz, ExxonMobil Environmental and Property Solutions
Martin Crosson, U.S. Army Corps of Engineers, Buffalo
Sandie Doran, U.S. Fish and Wildlife Service
Natalie Sacco, NYSDEC, Albany
Lisa Holst, NYSDEC, Bureau of Fisheries, Region 9
Michael R. Clancy, NYSDEC, Bureau of Fisheries, Region 9

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REPORT FOR 2022 FRESHWATER MUSSEL INDIRECT EFFECTS AREA MONITORING ON THE ALLEGHENY RIVER

Cattaraugus County, New York

DEC Spill Number 0650800

Prepared for:

ROUX

12 Gill Street
Suite 4700
Woburn, MA 01801

Project No.: 16574
Date: 10/3/22

Prepared by:

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Excellence In Any Environment

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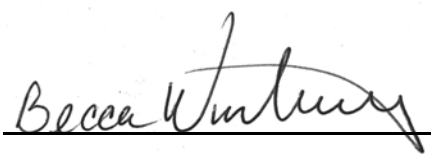
2022 Freshwater Mussel Indirect Effects Area Monitoring Report
DEC Spill Number 0650800
Document Date: 10/3/22
Project No.: 16574

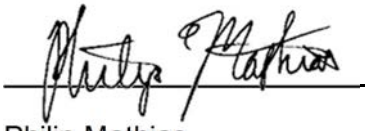
Authorization for Release

The analyses, opinions, and conclusions in this document are based entirely on EnviroScience's unbiased, professional judgment. EnviroScience's compensation is not in any way contingent on any action or event resulting from this study.

The undersigned attest, to the best of their knowledge, that this document and the information contained herein is accurate and conforms to EnviroScience's internal Quality Assurance standards.



Becca Winterringer
Senior Scientist/Project Manager



Philip Mathias
Senior Scientist/Project Manager (Technical Reviewer)

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1.0 INTRODUCTION

ExxonMobil voluntarily remediated petroleum material in sediment within a portion of the Allegheny River in October 2021; the New York State Department of Environmental Conservation (NYSDEC) Spill Number for the project is 0650800 (Project; Figure 1). Multiple mussel surveys, relocations, and project associated monitoring events have been completed to facilitate this remediation to date (EnviroScience, 2019, 2020, and 2021). Two separate relocation events occurred in 2019 and 2020, respectively (EnviroScience 2019, 2020). Following each of the relocations, two complimentary monitoring events were required: the first occurred between 30- and 60-days post the 2020 relocation effort (EnviroScience, 2020) and the second occurred one year after remediation construction activities were completed. The remediation work was completed September 1, 2021. The report herein documents the one-year post-construction monitoring event and details survival and growth of mussels within indirect effects areas.

In 2020, EnviroScience collected 450 mussels currently living within the indirect effect area, and Passive Integrated Transponder (PIT) tags were affixed to the exterior of those individuals' shells. Tags were affixed to monitor any potential effects of remediation to the resident mussel population in the three indirect effects monitoring areas as shown on Figure 1. The 450 mussels collected were comprised of approximately half Rayed Bean (*Villosa fabalis*) and half non-listed species, and were placed in three different locations (upstream, laterally, and downstream) relative to the project.

1.1 BACKGROUND

All mussels found during the 2020 voluntary mussel salvage except for Rayed Bean were relocated to the previously identified relocation site in the Allegheny River (Relocation Action Area in Figure 1), which supports an existing mussel population including Rayed Bean. The Allegheny River relocation site was identified and established in June 2017. The Relocation Action Area is 50 to 100 m (164 to 328 ft) upstream of the project and received approval from NYSDEC (via email dated May 24, 2017). Rayed Bean were relocated to the Licking and Green Rivers, KY in 2020.

2.0 METHODS

EnviroScience held all necessary state and federal permits required to collect and handle common and protected mussel species for this project. See Appendix A for the NYSDEC Scientific Collecting Permits and USFWS Permit.

2.1 POST-CONSTRUCTION INDIRECT EFFECTS MONITORING AREAS

EnviroScience surveyed each 5-meter (m) x 5 m (16 feet [ft] x16 ft) cells with a Biomark HPR Plus PIT tag reader to aid in the collection of mussels within each cell. Each cell was scanned thoroughly for one hour to detect all tags within the boundaries of each cell (Table 1 and 2). Qualified staff from EnviroScience also visually and tactually searched the 5 m x 5 m cells and excavated a subset of PIT tagged individuals, which were brought to the surface to check for mortality and growth (Table 3). Cells were located using a handheld GPS at the following center point coordinates:

- Upstream Indirect Monitoring: 42.071938, -78.438049
- Lateral Indirect Monitoring: 42.072037, -78.439327

- Downstream Indirect Monitoring: 42.072694, -78.440737.

2.2 MUSSEL HANDLING AND PROCESSING PROCEDURES

All mussels collected were counted and identified to species. Live mussels were not kept more than five minutes out of the water for processing and were kept shaded, moist, and cool. Dead shell specimens were scored as fresh dead (dead <1-year, lustrous nacre), weathered dead (dead one to many years; chalky nacre, fragmented, and worn periostracum), or subfossil (dead many years to many decades; severely worn and fragmented).

2.3 QUALITY CONTROL MEASURES

The field supervisor, Ms. Becca Winterringer, was the NYSDEC and USFWS approved malacologist. The EnviroScience personnel assisting with the monitoring effort included Mr. Philip Mathias (Senor Scientist), Mr. Matt Gilkay (Malacologist), and Mr. Ben Ebert (Diver Biologist), and all have experience at the project location and performed the 2021 post construction monitoring effort.

3.0 RESULTS

The one-year post-construction monitoring was completed on September 17, 2022. The river was at normal flow and the U.S. Geological Survey gage (USGS 03010820 Allegheny River at Olean) discharge was 430 cubic feet per second and gage height was 4.6 ft. Water temperature was 61.9 °Fahrenheit (16.6 °Celsius). Visibility exceeded 1 m (3.3 ft) although water clarity was opaque. Weather was sunny to partly cloudy and air temperature was 59.0 °Fahrenheit (15.0 °Celsius). Photo documentation of a few PIT mussels observed and the project area at the time of monitoring are provided in Appendix B.

A summary of the scanned and collected mussels detected in all three monitoring events is provided in Table 2. Tagged mussel detection during the pre-construction and 30-day post construction monitoring of the indirect effects area was 69.8% and 41.1%, respectively. PIT tagged mussel detection during the initial scan of each cell in the one-year monitoring was 45.3%, and survival was 89.0% (Table 2). A total of 5 tags were found to have compromised integrity (*e.g.,* tag detached from mussel upon removal from substrate) during the one-year post-construction monitoring; 10 tags had compromise integrity in the 2021 post construction monitoring event. Most mussels collected and measured showed growth (Table 3).

In the one-year monitoring it appears approximately 33% of the detected collected mussels had not been measured since their initial placement into the monitoring grids; four individuals were detected for the first time since initial placement. There were 12 scanned detections in the one-year monitoring event not previously scanned since their initial placement. Overall rate of detection for the project monitoring combining detection data form all three events was approximately 76%.

4.0 CONCLUSIONS

Results of the one-year post construction indirect effects monitoring indicated no acute mortality occurred as a result of the remediation and the overall site conditions at each of the monitoring cells continue to appear undisturbed. A small increase in tag detection was evident between the 30-day and one-year monitoring events (41.1% versus 45.3%). Repeat detectability varied across

years (Table 1). This may be due to the depth at which mussels can bury and its effect on the antenna range. The large PIT tags (12 millimeter [mm]) used on the common species have a read range of up to 12 inches, while the smaller PIT tags used on Rayed Bean (8 mm) have a read range of 6-8 inches. Mussels buried deeper than that and other environmental factors (i.e., large rocks) may affect mussels detectability over the monitoring events as they migrate laterally and seasonally (vertically) in the substrate. Survivorship in the indirect effects monitoring cells remained high during the 2021 and 2022 post construction monitoring events within the indirect effects area.

5.0 LITERATURE CITED

EnviroScience, Inc. (2021). 2021 Freshwater mussel monitoring on the Allegheny River, Cattaraugus County, New York (DEC Spill Number 0650800). Report prepared for Roux Associates. 46 pp.

EnviroScience, Inc. (2020). 2020 freshwater mussel voluntary salvage, relocation, and monitoring on the Allegheny River for a proposed remediation project in Cattaraugus County, New York (DEC Spill Number 0650800). Report prepared for Roux Associates. 22 pp.

EnviroScience, Inc. (2019). Freshwater mussel salvage, relocation, and monitoring on the Allegheny River for the proposed remediation project in Cattaraugus County, New York (DEC Spill Number 0650800). Report prepared for Roux Associates. 22 pp.

Williams, J. D., Bogan, A. E., Butler, R. S., Cummings, K. S., Garner, J. T., Harris, J. L., & Watters, G. T. (2017). A revised list of the freshwater mussels (Mollusca: Bivalvia: Unionida) of the United States and Canada. *Freshwater Mollusk Biology and Conservation*, 20(2), 33-58.

TABLES

Table 1. Pre-Construction & Post-Construction Scan Results for the Indirect Monitoring Cells, Allegheny River, Olean, New York, 2021 -2022.
Tag Numbers for Mussels in the Indirect Monitoring Cells

HEX Tag ID	DEC Tag ID	Species Code	Initial Length (mm)	Sex	Cell	Monitoring Event		
						Pre	30 Days	1 Year
3D6.1D59B0798D	982.126058789261	VIFA	20	F	DNS	Detected		
3D6.1D59B07993	982.126058789267	VIFA	28	M	DNS	Detected		
3D6.1D59B0799B	982.126058789275	VIFA	27	M	DNS	Detected		
3D6.1D59B0799E	982.126058789278	VIFA	20	F	DNS	Detected		Detected
3D6.1D59B079A2	982.126058789282	VIFA	29	M	DNS	Detected	Detected	
3D6.1D59B079A4	982.126058789284	VIFA	24	M	DNS			
3D6.1D59B079A6	982.126058789286	VIFA	27	M	DNS	Detected	Detected	
3D6.1D59B079B7	982.126058789303	VIFA	20	F	DNS	Detected		Detected
3D6.1D59B079BC	982.126058789308	VIFA	25	M	DNS	Detected		
3D6.1D59B079BF	982.126058789311	VIFA	24	F	DNS	Detected		
3D6.1D59B079C4	982.126058789316	VIFA	21	F	DNS	Detected		
3D6.1D59B079C5	982.126058789317	VIFA	18	F	DNS	Detected		
3D6.1D59B079C9	982.126058789321	VIFA	25	M	DNS	Detected	Detected	Detected
3D6.1D59B079D8	982.126058789336	VIFA	25	M	DNS			
3D6.1D59B079E4	982.126058789348	VIFA	24	M	DNS			
3D6.1D59B079ED	982.126058789357	VIFA	22	M	DNS			
3D6.1D59B08CBF	982.126058794175	VIFA	20	M	DNS	Detected		
3D6.1D59B08CC0	982.126058794176	VIFA	23	M	DNS	Detected		
3D6.1D59B08CC1	982.126058794177	VIFA	27	M	DNS			
3D6.1D59B08CC4	982.126058794180	VIFA	23	F	DNS			
3D6.1D59B08CC7	982.126058794183	VIFA	26	M	DNS	Detected		
3D6.1D59B08CC9	982.126058794185	VIFA	23	M	DNS	Detected		
3D6.1D59B08CCA	982.126058794186	VIFA	26	M	DNS	Detected		
3D6.1D59B08CCB	982.126058794187	VIFA	26	M	DNS			
3D6.1D59B08CCC	982.126058794188	VIFA	27	M	DNS	Detected		
3D6.1D59B08CCD	982.126058794189	VIFA	27	M	DNS	Detected		
3D6.1D59B08CCF	982.126058794191	VIFA	24	F	DNS	Detected		Detected
3D6.1D59B08CD1	982.126058794193	VIFA	22	F	DNS	Detected		
3D6.1D59B08CD3	982.126058794195	VIFA	22	M	DNS	Detected		
3D6.1D59B08CD4	982.126058794196	VIFA	20	M	DNS	Detected	Detected	
3D6.1D59B08CD7	982.126058794199	VIFA	30	F	DNS			
3D6.1D59B08CD8	982.126058794200	VIFA	29	M	DNS			
3D6.1D59B08CDA	982.126058794202	VIFA	25	M	DNS			
3D6.1D59B08CDD	982.126058794205	VIFA	22	F	DNS	Detected		Detected
3D6.1D59B08CDF	982.126058794207	VIFA	23	F	DNS	Detected		Detected
3D6.1D59B08CE0	982.126058794208	VIFA	28	M	DNS	Detected		
3D6.1D59B08CE1	982.126058794209	VIFA	24	M	DNS			
3D6.1D59B08CE3	982.126058794211	VIFA	26	M	DNS	Detected		
3D6.1D59B08CE4	982.126058794212	VIFA	29	M	DNS	Detected		
3D6.1D59B08CE5	982.126058794213	VIFA	22	F	DNS	Detected		
3D6.1D59B08CE7	982.126058794215	VIFA	21	F	DNS		Detected	
3D6.1D59B08CEA	982.126058794218	VIFA	17	F	DNS			
3D6.1D59B08CEB	982.126058794219	VIFA	27	M	DNS	Detected		
3D6.1D59B08CEC	982.126058794220	VIFA	21	F	DNS	Detected		
3D6.1D59B08CF0	982.126058794224	VIFA	24	M	DNS			
3D6.1D59B08CF1	982.126058794225	VIFA	29	M	DNS	Detected		
3D6.1D59B08CF2	982.126058794226	VIFA	23	F	DNS			
3D6.1D59B08CF3	982.126058794227	VIFA	16	F	DNS			
3D6.1D59B08CF4	982.126058794228	VIFA	21	F	DNS	Detected		
3D6.1D59B08CF6	982.126058794230	VIFA	22	F	DNS			
3D6.1D59B08CF9	982.126058794233	VIFA	29	M	DNS	Detected	Detected	Detected
3D6.1D59B08CFB	982.126058794235	VIFA	27	M	DNS			
3D6.1D59B08CFD	982.126058794237	VIFA	28	M	DNS	Detected		
3D6.1D59B08CFF	982.126058794239	VIFA	17	F	DNS	Detected		
3D6.1D59B08D00	982.126058794240	VIFA	34	M	DNS	Detected		Detected
3D6.1D59B08D01	982.126058794241	VIFA	28	M	DNS			
3D6.1D59B08D02	982.126058794242	VIFA	23	F	DNS	Detected		
3D6.1D59B08D03	982.126058794243	VIFA	24	M	DNS	Detected		
3D6.1D59B08D05	982.126058794245	VIFA	26	M	DNS	Detected	Detected	Detected
3D6.1D59B08D07	982.126058794247	VIFA	26	M	DNS	Detected		
3D6.1D59B08D08	982.126058794248	VIFA	27	M	DNS	Detected		

Table 1. Pre-Construction & Post-Construction Scan Results for the Indirect Monitoring Cells, Allegheny River, Olean, New York, 2021 -2022.
Tag Numbers for Mussels in the Indirect Monitoring Cells

HEX Tag ID	DEC Tag ID	Species Code	Initial Length (mm)	Sex	Cell	Monitoring Event		
						Pre	30 Days	1 Year
3D6.1D59B08D0C	982.126058794252	VIFA	27	M	DNS	Detected		
3D6.1D59B08D0D	982.126058794253	VIFA	25	M	DNS	Detected	Detected	
3D6.1D59B08D0E	982.126058794254	VIFA	29	M	DNS			
3D6.1D59B08D0F	982.126058794255	VIFA	24	M	DNS	Detected	Detected	
3D6.1D59B08D12	982.126058794258	VIFA	26	M	DNS	Detected		
3D6.1D59B08D13	982.126058794259	VIFA	23	F	DNS			Detected
3D6.1D59B08D16	982.126058794262	VIFA	21	F	DNS			
3D6.1D59B08D18	982.126058794264	VIFA	19	F	DNS			
3D6.1D59B08D1A	982.126058794266	VIFA	21	M	DNS			
3D6.1D59B08D1C	982.126058794268	VIFA	29	M	DNS	Detected		
3D6.1D59B08D20	982.126058794272	VIFA	23	M	DNS	Detected		
3D6.1D59B08D21	982.126058794273	VIFA	26	M	DNS	Detected		
3DD.003D7A25EB	989.001031415275	ACLI	85		DNS	Detected		Detected
3DD.003D7A25EC	989.001031415276	ACLI	82		DNS	Detected	Detected	Detected
3DD.003D7A25ED	989.001031415277	EUDI	94		DNS	Detected		
3DD.003D7A25EE	989.001031415278	PLSI	83		DNS	Detected	Detected	Detected
3DD.003D7A25EF	989.001031415279	PLSI	56		DNS	Detected		Detected
3DD.003D7A25F0	989.001031415280	LSCS	90		DNS	Detected		Detected
3DD.003D7A25F1	989.001031415281	EUDI	92		DNS			
3DD.003D7A25F2	989.001031415282	ACLI	108		DNS	Detected		Detected
3DD.003D7A25F3	989.001031415283	ACLI	81		DNS			Detected
3DD.003D7A25F5	989.001031415285	ACLI	119		DNS			Detected
3DD.003D7A25F6	989.001031415286	PLSI	88		DNS	Detected	Detected	Detected
3DD.003D7A25F8	989.001031415288	EUDI	88		DNS	Detected	Detected	Detected
3DD.003D7A25F9	989.001031415289	ACLI	88		DNS		Detected	
3DD.003D7A25FA	989.001031415290	ACLI	119		DNS	Detected		
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3DD.003D7A25FE	989.001031415294	EUDI	95		DNS	Detected	Detected	
3DD.003D7A25FF	989.001031415295	PLSI	90		DNS		Detected	
3DD.003D7A2600	989.001031415296	PLSI	53		DNS	Detected	Detected	
3DD.003D7A2601	989.001031415297	EUDI	92		DNS	Detected	Detected	
3DD.003D7A2602	989.001031415298	ACLI	65		DNS	Detected		Detected
3DD.003D7A2604	989.001031415300	EUDI	85		DNS	Detected		Detected
3DD.003D7A2605	989.001031415301	LAFA	58		DNS	Detected		Detected
3DD.003D7A2606	989.001031415302	ACLI	62		DNS	Detected		Detected
3DD.003D7A2607	989.001031415303	ACLI	65		DNS	Detected		
3DD.003D7A2608	989.001031415304	PLSI	78		DNS	Detected		Detected
3DD.003D7A2609	989.001031415305	ACLI	103		DNS	Detected	Detected	
3DD.003D7A260B	989.001031415307	ACLI	63		DNS	Detected	Detected	Detected
3DD.003D7A260D	989.001031415309	ACLI	65		DNS	Detected	Detected	
3DD.003D7A260E	989.001031415310	PLSI	73		DNS		Detected	Detected
3DD.003D7A260F	989.001031415311	ACLI	117		DNS	Detected	Detected	Detected
3DD.003D7A2610	989.001031415312	PLSI	26		DNS	Detected		Detected
3DD.003D7A2612	989.001031415314	EUDI	95		DNS	Detected	Detected	
3DD.003D7A2613	989.001031415315	EUDI	99		DNS	Detected	Detected	
3DD.003D7A2615	989.001031415317	ACLI	64		DNS			
3DD.003D7A2616	989.001031415318	PLSI	84		DNS	Detected		Detected
3DD.003D7A2617	989.001031415319	ACLI	126		DNS			
3DD.003D7A2618	989.001031415320	VIFA	85		DNS	Detected	Detected	
3DD.003D7A2619	989.001031415321	ACLI	131		DNS	Detected		Detected
3DD.003D7A261D	989.001031415325	PLSI	88		DNS	Detected		Detected
3DD.003D7A261E	989.001031415326	ACLI	108		DNS	Detected	Detected	Detected
3DD.003D7A261F	989.001031415327	EUDI	96		DNS	Detected	Detected	Detected
3DD.003D7A2622	989.001031415330	EUDI	92		DNS			Detected
3DD.003D7A2623	989.001031415331	ACLI	89		DNS	Detected	Detected	
3DD.003D7A2628	989.001031415336	EUDI	65		DNS	Detected		Detected
3DD.003D7A2629	989.001031415337	ACLI	43		DNS	Detected		Detected
3DD.003D7A262A	989.001031415338	ACLI	90		DNS	Detected		Detected
3DD.003D7A262B	989.001031415339	ACLI	67		DNS	Detected		

Table 1. Pre-Construction & Post-Construction Scan Results for the Indirect Monitoring Cells, Allegheny River, Olean, New York, 2021 -2022.
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HEX Tag ID	DEC Tag ID	Species Code	Initial Length (mm)	Sex	Cell	Monitoring Event		
						Pre	30 Days	1 Year
3DD.003D7A262C	989.001031415340	ACLI	63		DNS	Detected	Detected	
3DD.003D7A262E	989.001031415342	PLSI	69		DNS	Detected		
3DD.003D7A262F	989.001031415343	ACLI	87		DNS		Detected	
3DD.003D7A2631	989.001031415345	ACLI	132		DNS	Detected		Detected
3DD.003D7A2632	989.001031415346	ACLI	46		DNS	Detected	Detected	Detected
3DD.003D7A2633	989.001031415347	STUN	47		DNS			
3DD.003D7A2634	989.001031415348	EUDI	107		DNS	Detected	Detected	Detected
3DD.003D7A2635	989.001031415349	ACLI	67		DNS	Detected		Detected
3DD.003D7A2636	989.001031415350	PLSI	84		DNS	Detected		Detected
3DD.003D7A2637	989.001031415351	EUDI	51		DNS	Detected		Detected
3DD.003D7A2638	989.001031415352	ACLI	86		DNS	Detected	Detected	Detected
3DD.003D7A2639	989.001031415353	LSCS	108		DNS	Detected		Detected
3DD.003D7A263A	989.001031415354	ACLI	70		DNS	Detected		Detected
3DD.003D7A263B	989.001031415355	EUDI	73		DNS	Detected		Detected
3DD.003D7A263C	989.001031415356	VIFA	57		DNS	Detected		Detected
3DD.003D7A263D	989.001031415357	ACLI	70		DNS	Detected	Detected	
3DD.003D7A263E	989.001031415358	EUDI	90		DNS	Detected	Detected	
3DD.003D7A263F	989.001031415359	EUDI	74		DNS	Detected	Detected	Detected
3DD.003D7A2641	989.001031415361	ACLI	80		DNS	Detected		Detected
3DD.003D7A2643	989.001031415363	LSCS	94		DNS	Detected		Detected
3DD.003D7A2644	989.001031415364	EUDI	46		DNS	Detected		Detected
3DD.003D7A2645	989.001031415365	PLSI	45		DNS	Detected	Detected	Detected
3DD.003D7A2646	989.001031415366	EUDI	47		DNS	Detected		Detected
3DD.003D7A2649	989.001031415369	ACLI	68		DNS	Detected		Detected
3DD.003D7A264A	989.001031415370	ACLI	55		DNS			
3DD.003D7A264B	989.001031415371	EUDI	83		DNS	Detected	Detected	
3DD.003D7A264C	989.001031415372	ACLI	92		DNS	Detected		
3D6.1D59B0798A	982.126058789258	VIFA	23	M	LAT			
3D6.1D59B0798B	982.126058789259	VIFA	22	F	LAT			
3D6.1D59B0798C	982.126058789260	VIFA	25	M	LAT			
3D6.1D59B0798F	982.126058789263	VIFA	21	F	LAT	Detected	Detected	Detected
3D6.1D59B07990	982.126058789264	VIFA	24	M	LAT	Detected	Detected	
3D6.1D59B07995	982.126058789269	VIFA	20	M	LAT	Detected		Detected
3D6.1D59B07998	982.126058789272	VIFA	25	M	LAT		Detected	
3D6.1D59B07999	982.126058789273	VIFA	24	M	LAT			Detected
3D6.1D59B0799A	982.126058789274	VIFA	31	M	LAT	Detected	Detected	Detected
3D6.1D59B0799D	982.126058789277	VIFA	21	M	LAT	Detected		
3D6.1D59B079A0	982.126058789280	VIFA	25	M	LAT	Detected		Detected
3D6.1D59B079A1	982.126058789281	VIFA	25	M	LAT		Detected	Detected
3D6.1D59B079A3	982.126058789283	VIFA	22	F	LAT	Detected		Detected
3D6.1D59B079A5	982.126058789285	VIFA	26	M	LAT			
3D6.1D59B079A7	982.126058789287	VIFA	21	M	LAT			
3D6.1D59B079A8	982.126058789288	VIFA	25	M	LAT		Detected	
3D6.1D59B079AA	982.126058789290	VIFA	20	F	LAT	Detected		
3D6.1D59B079AC	982.126058789292	VIFA	20	F	LAT	Detected	Detected	Detected
3D6.1D59B079AE	982.126058789294	VIFA	21	F	LAT			
3D6.1D59B079AF	982.126058789295	VIFA	25	F	LAT	Detected	Detected	
3D6.1D59B079B0	982.126058789296	VIFA	23	M	LAT			
3D6.1D59B079B1	982.126058789297	VIFA	30	M	LAT			
3D6.1D59B079B6	982.126058789302	VIFA	23	M	LAT			
3D6.1D59B079B8	982.126058789304	VIFA	25	M	LAT	Detected		
3D6.1D59B079BB	982.126058789307	VIFA	25	M	LAT	Detected		Detected
3D6.1D59B079BD	982.126058789309	VIFA	25	M	LAT	Detected		Detected
3D6.1D59B079C1	982.126058789313	VIFA	29	M	LAT	Detected	Detected	Detected
3D6.1D59B079C3	982.126058789315	VIFA	21	M	LAT	Detected		
3D6.1D59B079C7	982.126058789319	VIFA	21	F	LAT	Detected	Detected	
3D6.1D59B079C8	982.126058789320	VIFA	19	F	LAT	Detected	Detected	
3D6.1D59B079CA	982.126058789322	VIFA	25	M	LAT			Detected
3D6.1D59B079CB	982.126058789323	VIFA	26	M	LAT		Detected	
3D6.1D59B079CC	982.126058789324	VIFA	20	F	LAT	Detected	Detected	
3D6.1D59B079CD	982.126058789325	VIFA	25	M	LAT		Detected	

Table 1. Pre-Construction & Post-Construction Scan Results for the Indirect Monitoring Cells, Allegheny River, Olean, New York, 2021 -2022.
Tag Numbers for Mussels in the Indirect Monitoring Cells

HEX Tag ID	DEC Tag ID	Species Code	Initial Length (mm)	Sex	Cell	Monitoring Event		
						Pre	30 Days	1 Year
3D6.1D59B079D0	982.126058789328	VIFA	21	F	LAT		Detected	
3D6.1D59B079D1	982.126058789329	VIFA	26	M	LAT			
3D6.1D59B079D2	982.126058789330	VIFA	20	M	LAT	Detected		
3D6.1D59B079D3	982.126058789331	VIFA	25	M	LAT	Detected		Detected
3D6.1D59B079D4	982.126058789332	VIFA	26	M	LAT			
3D6.1D59B079D6	982.126058789334	VIFA	22	F	LAT			
3D6.1D59B079D9	982.126058789337	VIFA	24	M	LAT	Detected		Detected
3D6.1D59B079DA	982.126058789338	VIFA	26	M	LAT	Detected		Detected
3D6.1D59B079DB	982.126058789339	VIFA	26	M	LAT	Detected		Detected
3D6.1D59B079DC	982.126058789340	VIFA	22	F	LAT	Detected		
3D6.1D59B079DD	982.126058789341	VIFA	25	M	LAT	Detected		
3D6.1D59B079E0	982.126058789344	VIFA	21	F	LAT			
3D6.1D59B079E1	982.126058789345	VIFA	26	M	LAT	Detected	Detected	Detected
3D6.1D59B079E3	982.126058789347	VIFA	20	F	LAT	Detected		
3D6.1D59B079E5	982.126058789349	VIFA	22	M	LAT	Detected		Detected
3D6.1D59B079E6	982.126058789350	VIFA	27	F	LAT	Detected		
3D6.1D59B079E7	982.126058789351	VIFA	28	F	LAT			
3D6.1D59B079E8	982.126058789352	VIFA	21	F	LAT	Detected		Detected
3D6.1D59B079E9	982.126058789353	VIFA	23	M	LAT	Detected	Detected	
3D6.1D59B079EB	982.126058789355	VIFA	23	M	LAT	Detected	Detected	
3D6.1D59B079EC	982.126058789356	VIFA	25	M	LAT			
3D6.1D59B08CBE	982.126058794174	VIFA	25	M	LAT	Detected		
3D6.1D59B08CC3	982.126058794179	VIFA	24	M	LAT			
3D6.1D59B08CC6	982.126058794182	VIFA	27	M	LAT		Detected	Detected
3D6.1D59B08CC8	982.126058794184	VIFA	20	F	LAT		Detected	Detected
3D6.1D59B08CCE	982.126058794190	VIFA	25	M	LAT	Detected		Detected
3D6.1D59B08CD0	982.126058794192	VIFA	27	F	LAT	Detected		
3D6.1D59B08CD6	982.126058794198	VIFA	25	M	LAT			Detected
3D6.1D59B08CD9	982.126058794201	VIFA	26	M	LAT	Detected		Detected
3D6.1D59B08CDB	982.126058794203	VIFA	25	M	LAT	Detected	Detected	Detected
3D6.1D59B08CDC	982.126058794204	VIFA	20	F	LAT			
3D6.1D59B08CEF	982.126058794223	VIFA	24	F	LAT			
3D6.1D59B08CF7	982.126058794231	VIFA	27	M	LAT		Detected	
3D6.1D59B08CF8	982.126058794232	VIFA	20	M	LAT	Detected		
3D6.1D59B08CFA	982.126058794234	VIFA	24	M	LAT	Detected		
3D6.1D59B08D04	982.126058794244	VIFA	20	F	LAT	Detected		
3D6.1D59B08D0B	982.126058794251	VIFA	20	F	LAT	Detected		
3D6.1D59B08D17	982.126058794263	VIFA	25	F	LAT	Detected		
3D6.1D59B08D1B	982.126058794267	VIFA	24	M	LAT			
3D6.1D59B08D1F	982.126058794271	VIFA	26	M	LAT	Detected		
3D6.1D59B08D59	982.126058794329	VIFA	21	F	LAT		Detected	Detected
3DD.003BF5828F	989.001005945487	PLSI	100		LAT	Detected	Detected	Detected
3DD.003BF58290	989.001005945488	EUDI	93		LAT	Detected	Detected	Detected
3DD.003BF58291	989.001005945489	PLSI	45		LAT	Detected		Detected
3DD.003BF58292	989.001005945490	ACLI	84		LAT			
3DD.003BF58294	989.001005945492	ACLI	133		LAT	Detected	Detected	Detected
3DD.003BF58296	989.001005945494	PLSI	92		LAT	Detected	Detected	Detected
3DD.003BF58297	989.001005945495	ACLI	100		LAT			Detected
3DD.003BF58298	989.001005945496	EUDI	52		LAT	Detected		Detected
3DD.003BF58299	989.001005945497	LAFA	47	M	LAT	Detected	Detected	Detected
3DD.003BF5829B	989.001005945499	EUDI	95		LAT	Detected		Detected
3DD.003BF5829E	989.001005945502	PLSI	101		LAT	Detected	Detected	
3DD.003BF5829F	989.001005945503	EUDI	90		LAT	Detected	Detected	
3DD.003BF582A0	989.001005945504	LACA	113	F	LAT	Detected	Detected	Detected
3DD.003BF582A3	989.001005945507	STUN	79		LAT	Detected		
3DD.003BF582A5	989.001005945509	EUDI	103		LAT	Detected	Detected	Detected
3DD.003BF582A6	989.001005945510	PLSI	91		LAT			
3DD.003BF582A7	989.001005945511	EUDI	83		LAT	Detected	Detected	Detected
3DD.003BF582A9	989.001005945513	LAOV	122		LAT	Detected	Detected	Detected
3DD.003BF582AA	989.001005945514	PLSI	100		LAT	Detected		Detected
3DD.003BF582AC	989.001005945516	EUDI	106		LAT	Detected	Detected	Detected

Table 1. Pre-Construction & Post-Construction Scan Results for the Indirect Monitoring Cells, Allegheny River, Olean, New York, 2021 -2022.
Tag Numbers for Mussels in the Indirect Monitoring Cells

HEX Tag ID	DEC Tag ID	Species Code	Initial Length (mm)	Sex	Cell	Monitoring Event		
						Pre	30 Days	1 Year
3DD.003BF582AF	989.001005945519	ACLI	73		LAT	Detected	Detected	
3DD.003BF582B1	989.001005945521	ACLI	95		LAT	Detected		Detected
3DD.003BF582B4	989.001005945524	EUDI	89		LAT	Detected	Detected	
3DD.003BF582BF	989.001005945535	PLSI	46		LAT	Detected	Detected	Detected
3DD.003BF582C6	989.001005945542	LAFA	77	F	LAT	Detected		
3DD.003BF582CD	989.001005945549	ACLI	92		LAT			
3DD.003BF582CE	989.001005945550	EUDI	85		LAT	Detected		Detected
3DD.003BF582D8	989.001005945560	PLSI	101		LAT	Detected	Detected	Detected
3DD.003BF582D9	989.001005945561	ACLI	118		LAT	Detected	Detected	Detected
3DD.003BF582DD	989.001005945565	EUDI	60		LAT	Detected		Detected
3DD.003BF582DE	989.001005945566	PLSI	96		LAT	Detected	Detected	Detected
3DD.003BF582DF	989.001005945567	EUDI	55		LAT	Detected	Detected	Detected
3DD.003BF582E1	989.001005945569	PLSI	85		LAT	Detected	Detected	Detected
3DD.003BF582E2	989.001005945570	PLSI	92		LAT	Detected	Detected	Detected
3DD.003BF582E9	989.001005945577	LSCS	110		LAT	Detected	Detected	
3DD.003BF582EA	989.001005945578	EUDI	85		LAT			
3DD.003BF582F1	989.001005945585	EUDI	91		LAT	Detected		Detected
3DD.003BF583C0	989.001005945792	ACLI	110		LAT	Detected	Detected	
3DD.003BF583C3	989.001005945795	PLSI	105		LAT	Detected	Detected	Detected
3DD.003BF583C9	989.001005945801	PLSI	84		LAT	Detected	Detected	Detected
3DD.003BF583CC	989.001005945804	EUDI	95		LAT	Detected	Detected	Detected
3DD.003BF583DF	989.001005945823	EUDI	113		LAT	Detected		Detected
3DD.003BF583E7	989.001005945831	ACLI	59		LAT	Detected		
3DD.003BF583EE	989.001005945838	LACA	143	M	LAT	Detected		Detected
3DD.003BF583EF	989.001005945839	EUDI	49		LAT	Detected		Detected
3DD.003BF583F3	989.001005945843	ACLI	118		LAT			
3DD.003BF583F8	989.001005945848	PLSI	43		LAT	Detected	Detected	Detected
3DD.003BF583FA	989.001005945850	ACLI	67		LAT	Detected	Detected	Detected
3DD.003BF583FB	989.001005945851	ACLI	126		LAT	Detected		Detected
3DD.003BF58401	989.001005945857	ACLI	118		LAT	Detected		
3DD.003BF58404	989.001005945860	EUDI	46		LAT	Detected	Detected	Detected
3DD.003BF58408	989.001005945864	PLSI	86		LAT	Detected	Detected	
3DD.003BF5840F	989.001005945871	ACLI	43		LAT	Detected	Detected	Detected
3DD.003BF58410	989.001005945872	PLSI	97		LAT	Detected	Detected	Detected
3DD.003BF58411	989.001005945873	LSCS	117		LAT	Detected	Detected	Detected
3DD.003BF58412	989.001005945874	ACLI	72		LAT	Detected	Detected	Detected
3DD.003BF58413	989.001005945875	ACLI	94		LAT	Detected	Detected	Detected
3DD.003BF58416	989.001005945878	STUN	50		LAT	Detected	Detected	Detected
3DD.003BF58419	989.001005945881	ACLI	55		LAT	Detected		Detected
3DD.003D7A2603	989.001031415299	ACLI	100		LAT			Detected
3DD.003D7A260A	989.001031415306	EUDI	95		LAT	Detected	Detected	
3DD.003D7A260C	989.001031415308	ACLI	120		LAT	Detected	Detected	Detected
3DD.003D7A2614	989.001031415316	LACA	78	F	LAT	Detected	Detected	Detected
3DD.003D7A261A	989.001031415322	PLSI	97		LAT	Detected	Detected	
3DD.003D7A261B	989.001031415323	EUDI	94		LAT	Detected	Detected	Detected
3DD.003D7A2621	989.001031415329	LACA	135		LAT	Detected	Detected	Detected
3DD.003D7A2624	989.001031415332	PLSI	101		LAT	Detected		Detected
3DD.003D7A2625	989.001031415333	EUDI	106		LAT	Detected		Detected
3DD.003D7A2626	989.001031415334	PLSI	104		LAT	Detected		Detected
3DD.003D7A2630	989.001031415344	ACLI	93		LAT			
3DD.003D7A2640	989.001031415360	PLSI	108		LAT			
3DD.003D7A2642	989.001031415362	ACLI	113		LAT			
3DD.003D7A2648	989.001031415368	ACLI	83		LAT	Detected	Detected	Detected
3DD.003D7A264D	989.001031415373	ACLI	123		LAT	Detected		
3DD.003D7A264E	989.001031415374	PLSI	68		LAT			
3D6.1D59B0798E	982.126058789262	VIFA	24	F	UPS			Detected
3D6.1D59B07991	982.126058789265	VIFA	25	M	UPS	Detected	Detected	Detected
3D6.1D59B07992	982.126058789266	VIFA	23	M	UPS			
3D6.1D59B07994	982.126058789268	VIFA	24	M	UPS	Detected		
3D6.1D59B07996	982.126058789270	VIFA	24	M	UPS		Detected	
3D6.1D59B07997	982.126058789271	VIFA	28	M	UPS			

Table 1. Pre-Construction & Post-Construction Scan Results for the Indirect Monitoring Cells, Allegheny River, Olean, New York, 2021 -2022.
Tag Numbers for Mussels in the Indirect Monitoring Cells

HEX Tag ID	DEC Tag ID	Species Code	Initial Length (mm)	Sex	Cell	Monitoring Event		
						Pre	30 Days	1 Year
3D6.1D59B0799F	982.126058789279	VIFA	30	M	UPS	Detected	Detected	
3D6.1D59B079A9	982.126058789289	VIFA	20	M	UPS	Detected	Detected	
3D6.1D59B079AB	982.126058789291	VIFA	22	M	UPS			
3D6.1D59B079AD	982.126058789293	VIFA	25	M	UPS			Detected
3D6.1D59B079B2	982.126058789298	VIFA	25	M	UPS	Detected	Detected	Detected
3D6.1D59B079B3	982.126058789299	VIFA	25	M	UPS			
3D6.1D59B079B4	982.126058789300	VIFA	26	M	UPS	Detected	Detected	Detected
3D6.1D59B079B5	982.126058789301	VIFA	26	F	UPS	Detected	Detected	Detected
3D6.1D59B079B9	982.126058789305	VIFA	25	M	UPS			
3D6.1D59B079BA	982.126058789306	VIFA	21	F	UPS			
3D6.1D59B079BE	982.126058789310	VIFA	28	M	UPS	Detected	Detected	
3D6.1D59B079C0	982.126058789312	VIFA	27	F	UPS	Detected	Detected	Detected
3D6.1D59B079C2	982.126058789314	VIFA	24	M	UPS	Detected		
3D6.1D59B079C6	982.126058789318	VIFA	27	M	UPS	Detected	Detected	
3D6.1D59B079CE	982.126058789326	VIFA	25	M	UPS	Detected	Detected	
3D6.1D59B079CF	982.126058789327	VIFA	24	M	UPS	Detected		
3D6.1D59B079D5	982.126058789333	VIFA	26	M	UPS			
3D6.1D59B079D7	982.126058789335	VIFA	24	F	UPS	Detected		
3D6.1D59B079DF	982.126058789343	VIFA	35	M	UPS	Detected	Detected	
3D6.1D59B079E2	982.126058789346	VIFA	28	M	UPS			
3D6.1D59B08CC2	982.126058794178	VIFA	32	M	UPS			
3D6.1D59B08CE9	982.126058794217	VIFA	26	F	UPS			
3D6.1D59B08D10	982.126058794256	VIFA	27	M	UPS	Detected		Detected
3D6.1D59B08D24	982.126058794276	VIFA	25	M	UPS			
3D6.1D59B08D26	982.126058794278	VIFA	28	F	UPS			
3D6.1D59B08D27	982.126058794279	VIFA	24	M	UPS			
3D6.1D59B08D29	982.126058794281	VIFA	25	M	UPS	Detected		
3D6.1D59B08D2C	982.126058794284	VIFA	25	M	UPS			
3D6.1D59B08D2D	982.126058794285	VIFA	25	M	UPS			
3D6.1D59B08D31	982.126058794289	VIFA	27	M	UPS			
3D6.1D59B08D33	982.126058794291	VIFA	25	M	UPS	Detected	Detected	
3D6.1D59B08D34	982.126058794292	VIFA	26	M	UPS			
3D6.1D59B08D36	982.126058794294	VIFA	27	M	UPS			
3D6.1D59B08D39	982.126058794297	VIFA	25	M	UPS			
3D6.1D59B08D3A	982.126058794298	VIFA	26	M	UPS	Detected		
3D6.1D59B08D3C	982.126058794300	VIFA	27	M	UPS			
3D6.1D59B08D3F	982.126058794303	VIFA	24	M	UPS	Detected		
3D6.1D59B08D40	982.126058794304	VIFA	23	M	UPS			
3D6.1D59B08D41	982.126058794305	VIFA	24	M	UPS	Detected		
3D6.1D59B08D48	982.126058794312	VIFA	25	M	UPS	Detected		
3D6.1D59B08D4A	982.126058794314	VIFA	30	M	UPS	Detected	Detected	Detected
3D6.1D59B08D4C	982.126058794316	VIFA	27	M	UPS			
3D6.1D59B08D4E	982.126058794318	VIFA	22	F	UPS			
3D6.1D59B08D50	982.126058794320	VIFA	26	M	UPS	Detected	Detected	
3D6.1D59B08D51	982.126058794321	VIFA	27	M	UPS			
3D6.1D59B08D52	982.126058794322	VIFA	25	M	UPS	Detected	Detected	Detected
3D6.1D59B08D5A	982.126058794330	VIFA	24	M	UPS			
3D6.1D59B08D5F	982.126058794335	VIFA	22	F	UPS			
3D6.1D59B08D61	982.126058794337	VIFA	23	F	UPS		Detected	Detected
3D6.1D59B08D62	982.126058794338	VIFA	25	M	UPS			
3D6.1D59B08D63	982.126058794339	VIFA	26	M	UPS	Detected		
3D6.1D59B08D64	982.126058794340	VIFA	26	M	UPS	Detected	Detected	
3D6.1D59B08D67	982.126058794343	VIFA	25	M	UPS	Detected		
3D6.1D59B08D68	982.126058794344	VIFA	24	M	UPS			
3D6.1D59B08D69	982.126058794345	VIFA	27	M	UPS			Detected
3D6.1D59B08D6A	982.126058794346	VIFA	25	M	UPS			
3D6.1D59B08D6D	982.126058794349	VIFA	24	M	UPS			
3D6.1D59B08D6F	982.126058794351	VIFA	25	F	UPS			
3D6.1D59B08D70	982.126058794352	VIFA	25	M	UPS			
3D6.1D59B08D71	982.126058794353	VIFA	25	M	UPS			
3D6.1D59B08D72	982.126058794354	VIFA	23	M	UPS	Detected	Detected	

Table 1. Pre-Construction & Post-Construction Scan Results for the Indirect Monitoring Cells, Allegheny River, Olean, New York, 2021 -2022.
Tag Numbers for Mussels in the Indirect Monitoring Cells

HEX Tag ID	DEC Tag ID	Species Code	Initial Length (mm)	Sex	Cell	Monitoring Event		
						Pre	30 Days	1 Year
3D6.1D59B08D74	982.126058794356	VIFA	26	M	UPS			
3D6.1D59B08D78	982.126058794360	VIFA	25	M	UPS			
3D6.1D59B08D79	982.126058794361	VIFA	24	M	UPS		Detected	Detected
3D6.1D59B08D7B	982.126058794363	VIFA	26	F	UPS			
3D6.1D59B08D81	982.126058794369	VIFA	26	M	UPS			
3D6.1D59B08D82	982.126058794370	VIFA	20	F	UPS			
3D6.1D59B08D85	982.126058794373	VIFA	25	M	UPS			
3D6.1D59B08D86	982.126058794374	VIFA	27	M	UPS			
3DD.003BF582C0	989.001005945536	PLSI	104		UPS	Detected	Detected	Detected
3DD.003BF5835A	989.001005945690	EUDI	96		UPS	Detected	Detected	Detected
3DD.003BF58361	989.001005945697	EUDI	102		UPS	Detected	Detected	Detected
3DD.003BF58364	989.001005945700	ACLI	97		UPS	Detected	Detected	Detected
3DD.003BF58366	989.001005945702	PLSI	93		UPS	Detected	Detected	Detected
3DD.003BF58376	989.001005945718	EUDI	103		UPS	Detected	Detected	Detected
3DD.003BF5837E	989.001005945726	ACLI	117		UPS	Detected	Detected	Detected
3DD.003BF58389	989.001005945737	EUDI	90		UPS	Detected	Detected	Detected
3DD.003BF58394	989.001005945748	PLSI	45		UPS	Detected	Detected	Detected
3DD.003BF583A2	989.001005945762	ACLI	114		UPS	Detected	Detected	Detected
3DD.003BF583AE	989.001005945774	PLSI	87		UPS	Detected	Detected	Detected
3DD.003BF583B3	989.001005945779	ACLI	88		UPS	Detected	Detected	Detected
3DD.003BF583B9	989.001005945785	EUDI	77		UPS	Detected	Detected	Detected
3DD.003BF583BA	989.001005945786	ACLI	71		UPS	Detected	Detected	Detected
3DD.003BF583BC	989.001005945788	ACLI	132		UPS	Detected	Detected	Detected
3DD.003BF583BD	989.001005945789	PLSI	51		UPS	Detected	Detected	Detected
3DD.003BF583BE	989.001005945790	LAFA	88	M	UPS	Detected	Detected	Detected
3DD.003BF583BF	989.001005945791	PLSI	57		UPS	Detected	Detected	Detected
3DD.003BF583C2	989.001005945794	LACA	129	M	UPS			
3DD.003BF583C4	989.001005945796	EUDI	103		UPS	Detected	Detected	Detected
3DD.003BF583C5	989.001005945797	ACLI	121		UPS	Detected	Detected	Detected
3DD.003BF583C6	989.001005945798	PLSI	60		UPS	Detected	Detected	Detected
3DD.003BF583C7	989.001005945799	ACLI	80		UPS	Detected	Detected	Detected
3DD.003BF583CA	989.001005945802	ACLI	112		UPS	Detected		Detected
3DD.003BF583CD	989.001005945805	EUDI	77		UPS	Detected	Detected	Detected
3DD.003BF583CE	989.001005945806	EUDI	106		UPS	Detected	Detected	
3DD.003BF583CF	989.001005945807	PLSI	55		UPS	Detected	Detected	Detected
3DD.003BF583D0	989.001005945808	LACA	121	F	UPS	Detected	Detected	Detected
3DD.003BF583D1	989.001005945809	EUDI	97		UPS	Detected	Detected	Detected
3DD.003BF583D2	989.001005945810	LACA	132	M	UPS	Detected	Detected	
3DD.003BF583D3	989.001005945811	PLSI	96		UPS	Detected		Detected
3DD.003BF583D4	989.001005945812	PLSI	103		UPS	Detected	Detected	Detected
3DD.003BF583D5	989.001005945813	PLSI	85		UPS			
3DD.003BF583D6	989.001005945814	ACLI	121		UPS	Detected	Detected	
3DD.003BF583D7	989.001005945815	ACLI	74		UPS	Detected	Detected	Detected
3DD.003BF583D9	989.001005945817	PLSI	87		UPS	Detected	Detected	Detected
3DD.003BF583DA	989.001005945818	LASI	111	M	UPS			
3DD.003BF583DB	989.001005945819	LAFA	53	F	UPS	Detected	Detected	Detected
3DD.003BF583DC	989.001005945820	EUDI	96		UPS	Detected		
3DD.003BF583DE	989.001005945822	PLSI	58		UPS	Detected	Detected	Detected
3DD.003BF583E0	989.001005945824	LSCS	92		UPS			
3DD.003BF583E2	989.001005945826	EUDI	74		UPS	Detected	Detected	Detected
3DD.003BF583E3	989.001005945827	ACLI	127		UPS	Detected	Detected	Detected
3DD.003BF583E5	989.001005945829	PLSI	80		UPS	Detected	Detected	Detected
3DD.003BF583E6	989.001005945830	PLSI	105		UPS	Detected	Detected	Detected
3DD.003BF583E9	989.001005945833	EUDI	88		UPS	Detected		Detected
3DD.003BF583EA	989.001005945834	PLSI	107		UPS			
3DD.003BF583EC	989.001005945836	ACLI	85		UPS	Detected	Detected	Detected
3DD.003BF583ED	989.001005945837	EUDI	83		UPS	Detected	Detected	Detected
3DD.003BF583F0	989.001005945840	PLSI	72		UPS	Detected	Detected	
3DD.003BF583F1	989.001005945841	ACLI	61		UPS	Detected	Detected	Detected
3DD.003BF583F4	989.001005945844	LSCS	113		UPS	Detected	Detected	Detected
3DD.003BF583F5	989.001005945845	EUDI	104		UPS			

Table 1. Pre-Construction & Post-Construction Scan Results for the Indirect Monitoring Cells, Allegheny River, Olean, New York, 2021 -2022.
Tag Numbers for Mussels in the Indirect Monitoring Cells

HEX Tag ID	DEC Tag ID	Species Code	Initial Length (mm)	Sex	Cell	Monitoring Event		
						Pre	30 Days	1 Year
3DD.003BF583F6	989.001005945846	EUDI	111		UPS	Detected	Detected	Detected
3DD.003BF583F9	989.001005945849	LASI	103	F	UPS	Detected	Detected	
3DD.003BF583FC	989.001005945852	PLSI	93		UPS	Detected	Detected	
3DD.003BF583FD	989.001005945853	ACLI	133		UPS			
3DD.003BF583FE	989.001005945854	PLSI	78		UPS	Detected	Detected	Detected
3DD.003BF583FF	989.001005945855	ACLI	117		UPS	Detected	Detected	Detected
3DD.003BF58400	989.001005945856	PLSI	100		UPS	Detected		
3DD.003BF58402	989.001005945858	EUDI	118		UPS	Detected	Detected	
3DD.003BF58403	989.001005945859	ACLI	120		UPS	Detected	Detected	Detected
3DD.003BF58405	989.001005945861	EUDI	90		UPS			
3DD.003BF58407	989.001005945863	EUDI	102		UPS	Detected	Detected	Detected
3DD.003BF5840A	989.001005945866	PLSI	97		UPS			
3DD.003BF5840C	989.001005945868	ACLI	116		UPS			
3DD.003BF5840D	989.001005945869	ACLI	137		UPS	Detected	Detected	
3DD.003BF5840E	989.001005945870	ACLI	122		UPS	Detected	Detected	Detected
3DD.003BF58415	989.001005945877	PLSI	110		UPS	Detected	Detected	Detected
3DD.003BF58417	989.001005945879	LAOV	136	M	UPS	Detected	Detected	Detected
3DD.003BF58418	989.001005945880	LAFA	87	M	UPS	Detected	Detected	Detected
3DD.003BF5841A	989.001005945882	PLSI	93		UPS	Detected	Detected	Detected
3DD.003BF5841B	989.001005945883	PLSI	65		UPS	Detected	Detected	Detected
3DD.003BF5841C	989.001005945884	PLSI	44		UPS	Detected	Detected	Detected
3DD.003BF5841E	989.001005945886	ACLI	135		UPS	Detected	Detected	
Supplemental PIT Individuals								
3DD.003BF583F7	-	*EUDI*	*55*		*LAT*		*Detected*	*Detected*
3DD.003BF583E1	-	*PLSI*	*No Data*		*UPS*			*Detected*
3DD.003D7A25F7	-	*PLSI*	*86*		*LAT*		*Detected*	
3DD.003BF583EB	-	*EUDI*	*45*		*LAT*			
3DD.003BF583CB	-	*ACLI*	*70*		*LAT*			
Total		449				314	185	204
Total Repeated Detections		344						
Total Not Detected		105						

Table 2. Summary of Scanned (Non-Intrusive Detection) and Collected Mussels Pre-Construction and Post-Construction Monitoring Events, Allegheny River, Olean, New York, 2021 - 2022. Acronyms are defined in Table 4.

2021 Pre-Construction								
Cell	Scanned	% Scanned	Total Collected	Live	Dead	CTI	Survivorship	VIFA[1]
DNS	113	75.3%	25	24	1	0	96.0%	6 (1)
LAT	94	62.7%	22	22	0	0	100.0%	3
UPS	107	71.3%	21	20	1	0	95.2%	2 (1)
All	314	69.8%	68	66	2	0	97.1%	11

2021 30-Days Post-Construction								
Cell	Scanned	% Scanned	Total Collected	Live	Dead	CTI	Survivorship	VIFA[1]
DNS	39	26.0%	11	10	1	3	90.9%	2 (1)
LAT	66	44.0%	15	15	0	4	100.0%	0
UPS	80	53.3%	29	28	1	3	96.6%	3 (1)
All	185	41.1%	55	53	2	10	96.4%	5

2022 1-Year Post Construction								
Cell	Scanned	% Scanned	Total Collected	Live	Dead	CTI	Survivorship	VIFA[1]
DNS	59	39.3%	28	27	1	2	96.4%	1 (1)
LAT	78[*]	52.0%	28	23	5	2	92.1%	5 (3)
UPS	67[*]	44.7%	35	31	4	1	88.6%	2 (2)
All	204	45.3%	91	81	10	5	89.0%	8 (6)

[1] Total VIFA collected and number dead of total in parantheses

[*] Does not include supplemental PIT tagged mussels detected; one each in LAT and UPS

Table 3. Mussels Collected after Scan Detection to Check for Survivorship and Growth. Initial, Pre-Construction, and Post-Construction Lengths (mm) are Provided along with their Condition (Live [L] or Dead [D]). CTI is Compromised Tag Integrity. Allegheny River, Olean, New York, 2021 - 2022. Acronyms are defined in Table 4.

HEX Tag ID	DEC Tag ID	Cell	Species Code	Sex	Length (mm)				Monitoring Event			Last Known Condition
					Initial	Pre-Const.	30 Days Post-Const.	1 yr Post-Const.	Pre Const.	30 Days Post Const.	1 Year Post Const.	
3D6.1D59B079C5	982.126058789317	DNS	VIFA	F	18	19			Detected			L
3D6.1D59B08CC7	982.126058794183	DNS	VIFA	M	26	21			Detected			L
3D6.1D59B08CD4	982.126058794196	DNS	VIFA	M	20		27		Detected	Detected		D
3D6.1D59B08CF4	982.126058794228	DNS	VIFA	F	21				Detected			D
3D6.1D59B08CFD	982.126058794237	DNS	VIFA	M	28	28			Detected			L
3D6.1D59B08D0F	982.126058794255	DNS	VIFA	M	24		27		Detected	Detected		L
3D6.11D59B08D05	982.126058794255	DNS	VIFA	M	26			24	Detected	Detected	Detected	D
3D6.1D59B08D20	982.126058794272	DNS	VIFA	M	23	27			Detected			L
3DD.003D7A25EB	989.001031415275	DNS	ACLI		85	86			Detected			L
3DD.003D7A25EE	989.001031415278	DNS	PLSI		83		85		Detected	Detected		L
3DD.003D7A25F6	989.001031415286	DNS	PLSI		88	88			Detected	Detected		L
3DD.003D7A25F8	989.001031415288	DNS	EUDI		88	89		88	Detected	Detected	Detected	L
3DD.003D7A25FE	989.001031415294	DNS	EUDI		95		94		Detected	Detected		L
3DD.003D7A2601	989.001031415297	DNS	EUDI		92	97	96		Detected	Detected		L
3DD.003D7A2602	989.001031415298	DNS	ACLI		65	71		81	Detected		Detected	L
3DD.003D7A2606	989.001031415302	DNS	ACLI		62	68			Detected			L
3DD.003D7A2607	989.001031415303	DNS	ACLI		65	70			Detected			L
3DD.003D7A260B	989.001031415307	DNS	ACLI		63	62		74	Detected	Detected	Detected	L
3DD.003D7A2612	989.001031415314	DNS	EUDI		95		96		Detected	Detected		L
3DD.003D7A2613	989.001031415315	DNS	EUDI		99		CTI		Detected	Detected		L
3DD.003D7A261F	989.001031415327	DNS	EUDI		96	92		96	Detected	Detected	Detected	L
3DD.003D7A262A	989.001031415338	DNS	ACLI		90	93		96	Detected		Detected	L
3DD.003D7A262B	989.001031415339	DNS	ACLI		67	71			Detected			L
3DD.003D7A2634	989.001031415348	DNS	EUDI		107		110		Detected	Detected		L
3DD.003D7A2635	989.001031415349	DNS	ACLI		67	72		74	Detected		Detected	L
3DD.003D7A2638	989.001031415352	DNS	ACLI		86	87		90	Detected	Detected	Detected	L
3DD.003D7A263A	989.001031415354	DNS	ACLI		70	74		80	Detected		Detected	L
3DD.003D7A263C	989.001031415356	DNS	VIFA		57	51			Detected			L
3DD.003D7A263D	989.001031415357	DNS	ACLI		70	75			Detected	Detected		L
3DD.003D7A263E	989.001031415358	DNS	EUDI		90	90	93		Detected	Detected		L
3DD.003D7A263F	989.001031415359	DNS	EUDI		74	75		76	Detected	Detected	Detected	L
3DD.003D7A2646	989.001031415366	DNS	EUDI		47	51			Detected			L
3DD.003D7A2649	989.001031415369	DNS	ACLI		68	71		80	Detected		Detected	L
3DD.003D7A25EC	989.001031415276	DNS	ACLI		82			89	Detected	Detected	Detected	L
3DD.003D7A25F5	989.001031415285	DNS	ACLI		119			120			Detected	L
3DD.003D7A25FC	989.001031415292	DNS	ACLI		45			64	Detected		Detected	L
3DD.003D7A260F	989.001031415311	DNS	ACLI		117			116	Detected	Detected	Detected	L
3DD.003D7A2632	989.001031415346	DNS	ACLI		46			68	Detected	Detected	Detected	L
3DD.003D7A2641	989.001031415361	DNS	ACLI		80			91	Detected		Detected	L
3DD.003D7A2604	989.001031415300	DNS	EUDI		85			85	Detected		Detected	L
3DD.003D7A2622	989.001031415330	DNS	EUDI		92			91			Detected	L
3DD.003D7A2628	989.001031415336	DNS	EUDI		65			67	Detected		Detected	L
3DD.003D7A2637	989.001031415351	DNS	EUDI		51			52	Detected		Detected	L
3DD.003D7A2644	989.001031415364	DNS	EUDI		46			56	Detected		Detected	L
3DD.003D7A2605	989.001031415301	DNS	LAFA		58			60	Detected		Detected	L
3DD.003D7A25EF	989.001031415279	DNS	PLSI		56			64	Detected		Detected	L
3DD.003D7A25FB	989.001031415291	DNS	PLSI		79			64	Detected		Detected	L

Table 3. Mussels Collected after Scan Detection to Check for Survivorship and Growth. Initial, Pre-Construction, and Post-Construction Lengths (mm) are Provided along with their Condition (Live [L] or Dead [D]). CTI is Compromised Tag Integrity. Allegheny River, Olean, New York, 2021 - 2022. Acronyms are defined in Table 4.

HEX Tag ID	DEC Tag ID	Cell	Species Code	Sex	Length (mm)				Monitoring Event			Last Known Condition
					Initial	Pre-Const.	30 Days Post-Const.	1 yr Post-Const.	Pre Const.	30 Days Post Const.	1 Year Post Const.	
3DD.003D7A25FD	989.001031415293	DNS	PLSI		69			72	Detected		Detected	L
3DD.003D7A2636	989.001031415350	DNS	PLSI		84			90	Detected		Detected	L
3DD.003D7A2645	989.001031415365	DNS	PLSI		45			54	Detected	Detected	Detected	L
3D6.1D59B08D05	982.126058794245	DNS	VIFA	M	26			24	Detected	Detected	Detected	D
CTI		DNS	ACLI				90					L
CTI		DNS	PLSI				86					L
CTI		DNS	PLSI					75				L
CTI		DNS	ACLI					130				L
3D6.1D59B0798F	982.126058789263	LAT	VIFA	F	21	22			Detected	Detected		L
3D6.1D59B079A3	982.126058789283	LAT	VIFA	F	22	24			Detected			L
3D6.1D59B08D17	982.126058794263	LAT	VIFA	F	25	25			Detected			L
3DD.003BF58294	989.001005945492	LAT	ACLI		133	132	134	132	Detected	Detected	Detected	L
3DD.003BF58296	989.001005945494	LAT	PLSI		92		92		Detected	Detected		L
3DD.003BF5829E	989.001005945502	LAT	PLSI		101		101		Detected	Detected		L
3DD.003BF582A7	989.001005945511	LAT	EUDI		83	83			Detected	Detected		L
3DD.003BF582A9	989.001005945513	LAT	LAOV		122	124		123	Detected	Detected	Detected	L
3DD.003BF582AF	989.001005945519	LAT	ACLI		73		CTI		Detected	Detected		L
3DD.003BF582BF	989.001005945535	LAT	PLSI		46	100	50		Detected	Detected		L
3DD.003BF582D9	989.001005945561	LAT	ACLI		118		118	116	Detected	Detected	Detected	L
3DD.003BF582DD	989.001005945565	LAT	EUDI		60	61		65	Detected		Detected	L
3DD.003BF582DE	989.001005945566	LAT	PLSI		96	92		94	Detected	Detected	Detected	L
3DD.003BF582E1	989.001005945569	LAT	PLSI		85	84		85	Detected	Detected	Detected	L
3DD.003BF582E2	989.001005945570	LAT	PLSI		92	92	95	95	Detected	Detected	Detected	L
3DD.003BF582E9	989.001005945577	LAT	LSCS		110	110	CTI		Detected	Detected	Detected	L
3DD.003BF583C0	989.001005945792	LAT	ACLI		110		CTI		Detected	Detected		L
3DD.003BF583C3	989.001005945795	LAT	PLSI		105		104	103	Detected	Detected	Detected	L
3DD.003BF583C9	989.001005945801	LAT	PLSI		84	84			Detected	Detected		L
3DD.003BF583F8	989.001005945848	LAT	PLSI		43		41		Detected	Detected		L
3DD.003BF583FB	989.001005945851	LAT	ACLI		126	126		126	Detected		Detected	L
3DD.003BF58411	989.001005945873	LAT	LSCS		117	117	112	116	Detected	Detected	Detected	D
3DD.003BF58412	989.001005945874	LAT	ACLI		72		77		Detected	Detected		L
3DD.003BF58416	989.001005945878	LAT	STUN		50			56	Detected	Detected	Detected	L
3DD.003D7A260C	989.001031415308	LAT	ACLI		120	124			Detected	Detected		L
3DD.003D7A2614	989.001031415316	LAT	LACA	F	78	79	83	86	Detected	Detected	Detected	L
3DD.003D7A261B	989.001031415323	LAT	EUDI		94	92		94	Detected	Detected	Detected	L
3DD.003D7A2624	989.001031415332	LAT	PLSI		101	99			Detected			L
3DD.003D7A2626	989.001031415334	LAT	PLSI		104	103		103	Detected		Detected	L
3DD.003D7A264D	989.001031415373	LAT	ACLI		123	121			Detected			L
3D6.1D59B0799A	982.126058789274	LAT	VIFA	M	31			28	Detected	Detected	Detected	D
3D6.1D59B079AC	982.126058789292	LAT	VIFA	F	20			22	Detected	Detected	Detected	L
3D6.1D59B079D9	982.126058789337	LAT	VIFA	M	24			25	Detected	Detected	Detected	D
3D6.1D59B08CC6	982.126058794182	LAT	VIFA	M	27			29	Detected		Detected	L
3D6.1D59B08CD9	982.126058794201	LAT	VIFA	M	26			27		Detected	Detected	D
3DD.003BF58291	989.001005945489	LAT	PLSI		45			54	Detected		Detected	L
3DD.003BF58297	989.001005945495	LAT	ACLI		100			100	Detected		Detected	L
3DD.003BF5829B	989.001005945499	LAT	EUDI		95			94			Detected	L
3DD.003BF582AC	989.001005945516	LAT	EUDI		106			106	Detected		Detected	D

Table 3. Mussels Collected after Scan Detection to Check for Survivorship and Growth. Initial, Pre-Construction, and Post-Construction Lengths (mm) are Provided along with their Condition (Live [L] or Dead [D]). CTI is Compromised Tag Integrity. Allegheny River, Olean, New York, 2021 - 2022. Acronyms are defined in Table 4.

HEX Tag ID	DEC Tag ID	Cell	Species Code	Sex	Length (mm)				Monitoring Event			Last Known Condition
					Initial	Pre-Const.	30 Days Post-Const.	1 yr Post-Const.	Pre Const.	30 Days Post Const.	1 Year Post Const.	
3DD.003BF582B1	989.001005945521	LAT	ACLI		95			96	Detected	Detected	Detected	L
3DD.003BF583CC	989.001005945804	LAT	EUDI		95			93	Detected		Detected	L
3DD.003BF583DF	989.001005945823	LAT	EUDI		113			112	Detected	Detected	Detected	L
3DD.003BF58419	989.001005945881	LAT	ACLI		55			71	Detected		Detected	L
3DD.003D7A2648	989.001031415368	LAT	ACLI		83			86	Detected		Detected	L
CTI		LAT	ACLI				119		Detected	Detected	Detected	L
CTI		LAT	ACLI					119				L
CTI		LAT	PLSI					108				L
3D6.1D59B079BE	982.126058789310	UPS	VIFA	M	28		32		Detected	Detected		L
3D6.1D59B079CE	982.126058789326	UPS	VIFA	M	25		26		Detected	Detected		D
3D6.1D59B079CF	982.126058789327	UPS	VIFA	M	24	24			Detected			D
3D6.1D59B079DF	982.126058789343	UPS	VIFA	M	35		36		Detected	Detected		L
3D6.1D59B08D67	982.126058794343	UPS	VIFA	M	25	26			Detected			L
3DD.003BF582C0	989.001005945536	UPS	PLSI		104	103	105	103	Detected	Detected	Detected	L
3DD.003BF58361	989.001005945697	UPS	EUDI		102	103	104	104	Detected	Detected	Detected	L
3DD.003BF58366	989.001005945702	UPS	PLSI		93	89			Detected	Detected		L
3DD.003BF58376	989.001005945718	UPS	EUDI		103		103	103	Detected	Detected	Detected	L
3DD.003BF5837E	989.001005945726	UPS	ACLI		117	116			Detected	Detected		L
3DD.003BF58389	989.001005945737	UPS	EUDI		90		92	90	Detected	Detected	Detected	L
3DD.003BF583A2	989.001005945762	UPS	ACLI		114		110	106	Detected	Detected	Detected	L
3DD.003BF583B3	989.001005945779	UPS	ACLI		88		92		Detected	Detected		L
3DD.003BF583BA	989.001005945786	UPS	ACLI		71	73	76	80	Detected	Detected	Detected	L
3DD.003BF583C5	989.001005945797	UPS	ACLI		121	122		123	Detected	Detected	Detected	L
3DD.003BF583CA	989.001005945802	UPS	ACLI		112		110	113	Detected		Detected	L
3DD.003BF583CE	989.001005945806	UPS	EUDI		106		106		Detected	Detected		L
3DD.003BF583D1	989.001005945809	UPS	EUDI		97	96		97	Detected	Detected	Detected	L
3DD.003BF583D4	989.001005945812	UPS	PLSI		103	100	104	102	Detected	Detected	Detected	L
3DD.003BF583D6	989.001005945814	UPS	ACLI		121	122	122		Detected	Detected		L
3DD.003BF583D9	989.001005945817	UPS	PLSI		87		87	85	Detected	Detected	Detected	D
3DD.003BF583DB	989.001005945819	UPS	LAFA	F	53	56	52		Detected	Detected		L
3DD.003BF583DE	989.001005945822	UPS	PLSI		58		87		Detected	Detected		L
3DD.003BF583E2	989.001005945826	UPS	EUDI		74		76	76	Detected	Detected	Detected	L
3DD.003BF583E6	989.001005945830	UPS	PLSI		105	103	106		Detected	Detected		L
3DD.003BF583EC	989.001005945836	UPS	ACLI		85		89	90	Detected	Detected	Detected	L
3DD.003BF583ED	989.001005945837	UPS	EUDI		83	85		84	Detected	Detected	Detected	L
3DD.003BF583F4	989.001005945844	UPS	LSCS		113	115	115	114	Detected	Detected	Detected	D
3DD.003BF583F6	989.001005945846	UPS	EUDI		111		111	111	Detected	Detected	Detected	L
3DD.003BF583F9	989.001005945849	UPS	LASI	F	103	100	104		Detected	Detected		L
3DD.003BF583FE	989.001005945854	UPS	PLSI		78		78	77	Detected	Detected	Detected	L
3DD.003BF58403	989.001005945859	UPS	ACLI		120	116			Detected	Detected		L
3DD.003BF5840D	989.001005945869	UPS	ACLI		137		CTI		Detected	Detected		L
3DD.003BF5840E	989.001005945870	UPS	ACLI		122	119	122		Detected	Detected		L
3DD.003BF58415	989.001005945877	UPS	PLSI		110	111			Detected	Detected		L
3DD.003BF5841C	989.001005945884	UPS	PLSI		44	46			Detected	Detected		L
3D6.1D59B08D52	982.126058794322	UPS	VIFA	M	25			26	Detected	Detected	Detected	D
3D6.1D59B08D69	982.126058794345	UPS	VIFA	M	27			59			Detected	D
3DD.003BF5835A	989.001005945690	UPS	EUDI		96			97	Detected	Detected	Detected	L

Table 3. Mussels Collected after Scan Detection to Check for Survivorship and Growth. Initial, Pre-Construction, and Post-Construction Lengths (mm) are Provided along with their Condition (Live [L] or Dead [D]). CTI is Compromised Tag Integrity. Allegheny River, Olean, New York, 2021 - 2022. Acronyms are defined in Table 4.

HEX Tag ID	DEC Tag ID	Cell	Species Code	Sex	Length (mm)				Monitoring Event			Last Known Condition
					Initial	Pre-Const.	30 Days Post-Const.	1 yr Post-Const.	Pre Const.	30 Days Post Const.	1 Year Post Const.	
3DD.003BF58364	989.001005945700	UPS	ACLI		97			103	Detected	Detected	Detected	L
3DD.003BF583AE	989.001005945774	UPS	PLSI		87			84	Detected	Detected	Detected	L
3DD.003BF583B9	989.001005945785	UPS	EUDI		77			78	Detected	Detected	Detected	L
3DD.003BF583C4	989.001005945796	UPS	EUDI		103			110	Detected	Detected	Detected	L
3DD.003BF583C6	989.001005945798	UPS	PLSI		60			63	Detected	Detected	Detected	L
3DD.003BF583CD	989.001005945805	UPS	EUDI		77			78	Detected	Detected	Detected	L
3DD.003BF583CF	989.001005945807	UPS	PLSI		55			61	Detected	Detected	Detected	L
3DD.003BF583D3	989.001005945811	UPS	PLSI		96			97	Detected		Detected	L
3DD.003BF583E3	989.001005945827	UPS	ACLI		127			127	Detected	Detected	Detected	L
3DD.003BF583E5	989.001005945829	UPS	PLSI		80			81	Detected	Detected	Detected	L
3DD.003BF583E9	989.001005945833	UPS	EUDI		88			90	Detected		Detected	L
3DD.003BF583F1	989.001005945841	UPS	ACLI		61			76	Detected	Detected	Detected	L
3DD.003BF58407	989.001005945863	UPS	EUDI		102			103	Detected	Detected	Detected	L
3DD.003BF58417	989.001005945879	UPS	LAOV	M	136			135	Detected	Detected	Detected	L
3DD.003BF583E1		UPS	PLSI		ND			80			Detected	L
CTI		UPS	ACLI				136					L
CTI		UPS	EUDI		119		119					L
CTI		UPS	EUDI					117				L

Table 4. Acronym List and Definitions for the 2022 Mussel Monitoring Report. Allegheny River, Olean, New York, 2022.

Acronym	Definition	Comments
HEX Tag ID	Hexadecimal tag Unique ID	Unique alphanumeric ID pre-assigned to the PIT tag by the manufacturer. Code is relayed to the tag reader when the tag is excited by the 134.2 khz frequency transmitted by the tag reader/antenna
DEC Tag ID	Decimal tag Unique ID	Unique numeric ID pre-assigned to the PIT tag by the manufacturer. Code is relayed to the tag reader when the tag is excited by the 134.2 khz frequency transmitted by the tag reader/antenna
DNS	Downstream cell	Indirect effects monitoring cell
LAT	Lateral cell	Indirect effects monitoring cell
UPS	Upstream Cell	Indirect effects monitoring cell
CTI	Compromised Tag Integrity	Tag detached from mussel upon removal from substrate

Mussel Species (Williams et al. 2017; FMCS 2021) and their Conservation Status				
Species Code	Scientific Name	Common Name	Federal Conservation Status	NY State Conservation Status
ACLI	*Actinonaias ligamentina*	Mucket		
EPRA	*Epioblasma rangiana*	Northern Riffleshell	Endangered	
EUDI	*Eurynia dilatata*	Spike		
LACA	*Lampsilis cardium*	Plain Pocketbook		
LAFA	*Lampsilis fasciola*	Wavyrayed Lampmussel		Threatened
LAOV	*Lampsilis ovata*	Pocketbook		
LASI	*Lampsilis siliquoidea*	Fat Mucket		
LIRE	*Ligumia recta*	Black Sandshell		
LSCS	*Lasmigona costata*	Flutedshell		
PLSI	*Pleurobema sintoxia*	Round Pigtoe		
STUN	*Strophitus undulatus*	Creeper		
VIFA	*Paetulunio fabalis*	Rayed Bean	Endangered	Endangered

FIGURES

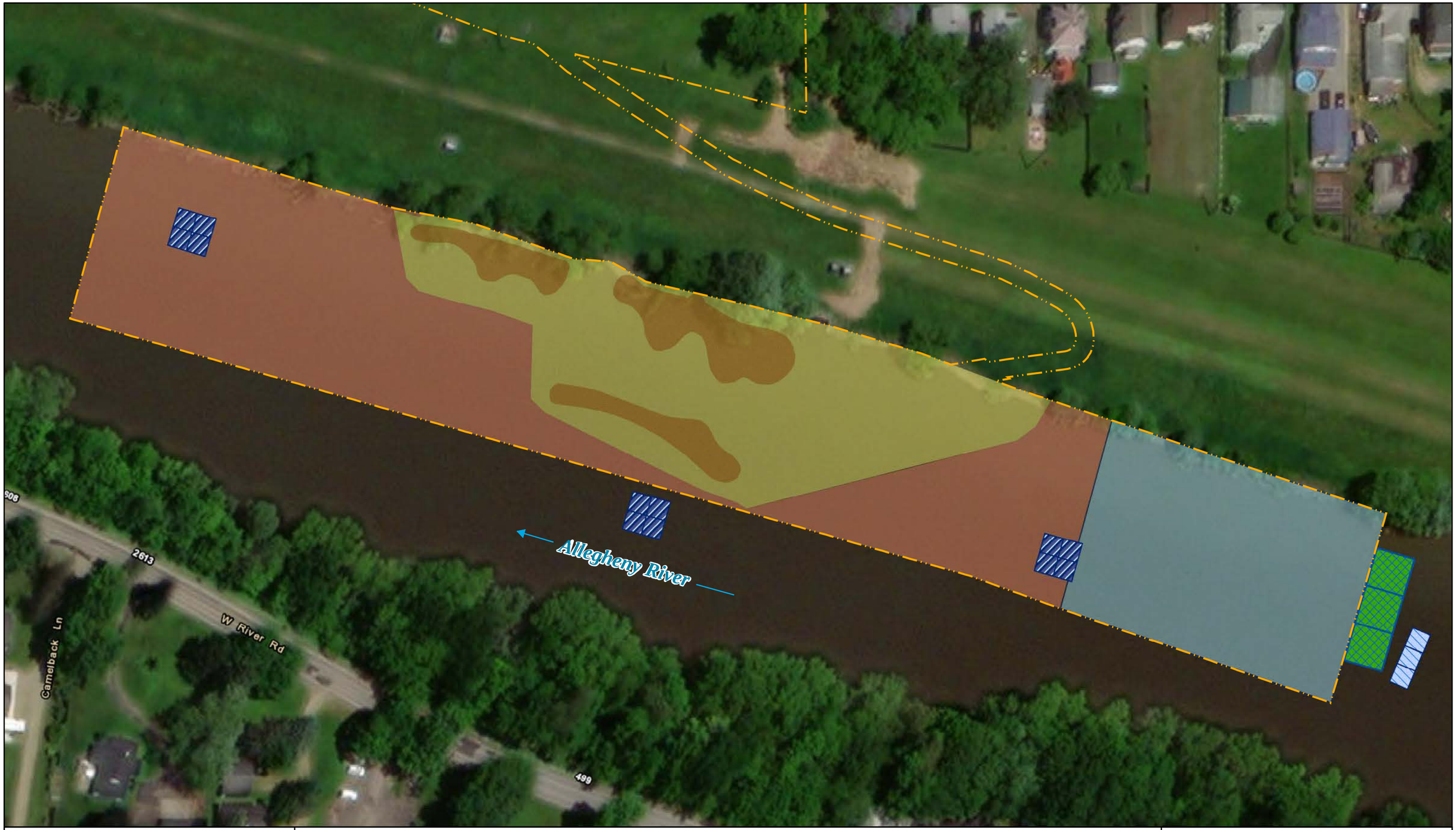

Figure 1. Site of Freshwater Mussel Monitoring Events on the Allegheny River. Cattaraugus County, NY. Roux Associates, Inc.

Project Action Area
Impacted Material
Direct Effects
Indirect Effects
Relocation Site
Monitoring Cell (10m x 10m) - 2018
ES Monitoring Cell (5m x 5m) - 2019
Indirect Effect Monitoring Area (5m x 5m)

0 50 100 200 Feet
0 15 30 60 Meters

EnviroScience
Excellence In Any Environment

Basemap courtesy of Esri.

Appendix A

NYSDEC and USFWS Scientific Collecting Permit

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
License to Collect or Possess- Freshwater Mussels # 79

LICENSE
Under the Environmental Conservation Law (ECL)

Licensee Information

License Issued To:
REBECCA WINTERRINGER
521 Sycamore Dr
Euclid, OH 44132

(216) 403-6041
COUNTY: ALBANY
REGION: 4

DEC Contact Information

DIVISION of FISH and WILDLIFE
SPECIAL LICENSES UNIT
625 BROADWAY, ALBANY, NEW YORK 12233-4752
PHONE: (518) 402-8985 FAX: (518) 402-8925
WEBSITE: http://www.dec.ny.gov

License Authorizations

License to Collect or Possess- Freshwater Mussels
License # 79

New License Effective Date: 7/21/2022 Expiration Date: 7/20/2023

NYSDEC Approval

By acceptance of this license, the licensee agrees that the license is contingent upon strict compliance with the ECL, all applicable regulations, and all conditions included as part of this license.

License Regulations

6 NYCRR Part 182
6 NYCRR Part 175

ECL 11-0515 (1)

LICENSE TO COLLECT OR POSSESS- FRESHWATER MUSSELS - LICENSE CONDITIONS

1. Collection from the Wild: Authorized Species, Specific The licensee is authorized to collect and possess the following species: Northern riffleshell (Epioblasma torulosa rangiana), Wavy-rayed lampmussel (Lampsilis fasciola), Rayed bean (Vilosa fabalis), Fresh water mussels (NY indigenous)

2. Scientific Collection - Authorized Activities The licensee is authorized to possess the collected species for the following activity(ies): Freshwater mussel, post relocation, survey.

3. Scientific Collection - Location The licensee is authorized to collect species from the following locations only:
.Allegheny River, in the Town of Olean, Cattaraugus County, NYSDEC Region 9. (47.072361/-78.435672)

4. Scientific Collection - Mussel Collection - Collection or Possession of Endangered or Threatened Species The licensee is authorized to collect and temporarily possess endangered/threatened mussel species pursuant to this license.

5. Scientific Collection – Mussel Collection -Time Frame Mussels shall not be collected after September 30, or prior to May 15, pursuant to this license.

6. Scientific Collection - Mussel Collection – Freshwater Mussel Survey Guidelines The licensee shall conform with all guidelines contained in the NYS DEC Freshwater Mussel Survey Guidelines available at: www.dec.ny.gov/permits/122781.html
Any questions regarding the guidelines should be sent to: freshwater.mussels@dec.ny.gov

7. Scientific Collection - Mussel Survey - Survey Plan The licensee shall perform mussel surveys as outlined in the Freshwater Mussel Monitoring Plan for Alleghany River in Olean, NY - July 29, 2019

8. Scientific Collection - Mussel Collection – Survey Conditions Mussels shall only be collected under the following conditions: typical low or base flow, water temperature of 55°F and above, air temperature of 50°F and above, and visibility of 0.5m or greater at depth of substrate at time of the survey.

9. Scientific Collection – Mussel Collection – Mussel Processing Freshwater mussels waiting for processing shall be kept submerged in the water using mesh bags or perforated buckets in an area with adequate flow and out of direct sun exposure. Mussels shall be replaced either on the surface of the substrate or partially into the substrate siphon end up.

10. Scientific Collection – Mussel Collection – Authorized Collection Technique and Equipment The licensee shall only collect authorized species using hand collection methods only. ***Use of combs, rakes or any mechanical means is prohibited.***

11. Scientific Collection – Mussel Survey - Temporary Possession and Release – Survey The licensee shall possess the listed animal(s) only for the minimum time necessary for the collection of biological

data. The licensee shall immediately release the listed animals unharmed at the point of original capture following the collection of biological data.

12. Scientific Collection – Mussel Survey - Removal of Species from the Wild Prohibited The licensee shall not remove the listed animals from the wild.

13. Scientific Collection – Mussel Survey - Endangered and Threatened Species - State and Federal Notification The licensee shall report any findings of New York State listed species to the regional DEC Bureau of Ecosystems Health Office within 24 hours. Any findings of federally listed species shall be reported to the USFWS New York Field Office at FW5ES_NYFO@fws.gov within 24 hours.

14. Scientific Collection – Mussel Survey - Candidate Relocation Site Survey A survey shall be conducted for a candidate relocation site provided imperiled mussels or a mussel concentration area is found at the time of the initial survey authorized under this license. This survey shall be conducted in accordance to the methods described in DEC's Freshwater Mussel Survey Guidelines. Definitions of imperiled mussels and a mussel concentration area can also be found in the guidelines.

15. Scientific Collection – Mussel Survey - Mussel Relocation Prohibited Mussels shall not be moved or relocated to another location when conducting a freshwater mussel survey. A relocation plan shall be submitted and approved by the DEC prior to relocating any mussel species.

16. Scientific Collection - Mussel Collection – Vouchers Dead shell vouchers, at least one of each species of shell found, shall be retained and submitted with a copy of the survey report to:

NYSDEC Mussel ID
6274 East Avon-Lima Rd,
Avon, NY 14414

Living mussels shall not be sacrificed for voucher purposes. The voucher shall be labeled with species name (common and scientific), survey date, survey location (waterbody name, Town & County, coordinates), number of specimens, and name of the collector.

17. Scientific Collection - Freshwater Fisheries - Bio-safety Protocol The licensee shall conform with all guidelines contained in the NYS DEC Bureau of Fisheries Sampling, Survey, Boat and Equipment Protocol, attached to this license as Appendix I. Any questions regarding the protocols may be directed to the Regional Fisheries Manager at:

Regional Fisheries Manager
NYSDEC Region 9 Headquarters
700 Delaware Ave
Buffalo, NY14209

18. Scientific Collection - Law Enforcement Notification The licensee shall notify the appropriate Regional Environmental Conservation Officer at least 48 hours prior to conducting activities pursuant to this license and within 24 hours upon the loss or theft of any collecting gear. Please use the following link for a listing of regional law enforcement phone numbers: http://www.dec.ny.gov/about/558.html

19. Scientific Collection - Mussel Survey - Mussel Identification Photographs A photograph of both the beak view and lateral view shall be taken of up to 5 individual imperiled species and at least one of all other species encountered and included in the mussel survey report. Photographs of empty shells of imperiled species

and of suspect or questionable species shall also be taken. For a definition of imperiled species, view the NYS DEC Freshwater Mussel Survey Guidelines.

20. Collection from the Wild - Authority to Designate Agents The licensee is authorized to designate agents to assist the licensee with the activities authorized pursuant to this license provided that:

a. the licensee submits a Designated Agent Form (available at: www.dec.ny.gov/permits/359.html) to the NYSDEC Special Licenses Unit at the address listed on the front of this license, and;

b. the licensee receives a license from the Special Licenses Unit listing the designated agent(s) he or she has nominated before that person can conduct activities authorized by this license.

21. Authorized Designated Agents The following Designated Agents are authorized: Phil Mathias.

22. Scientific Collection – Mussel Collection – Annual Mussel Data Form The licensee shall submit a mussel data form prior to December 31 of the same year the survey was conducted. The data form shall incorporate species collection information for the survey(s) conducted under the authority of this license. The form is available on DEC's website at: www.dec.ny.gov/permits/122781.html

23. Scientific Collection – Mussel Survey - Report of Survey Results The licensee shall submit a survey report to the regional DEC Division of Environmental Permits at least 45 days prior to any stream disturbance work. Where federally listed species are found, formal consultation with the USFWS New York Field Office shall be initiated at least 135 days in advance of the project's activity. The report shall comply with the requirements listed in DEC's Freshwater Mussel Survey Guidelines at: www.dec.ny.gov/permits/122781.html

The licensee shall also send an electronic copy of the report to: freshwater.mussels@dec.ny.gov no later than December 31 of the license year.

GENERAL CONDITIONS - Apply to ALL Authorized Licenses

1. GC – Licensee Shall Read All Conditions The licensee shall read all license conditions prior to conducting any activities authorized pursuant to this license.

2. GC – License is Not Transferrable This license is not transferrable and is valid only for the person identified as the licensee.

3. GC – Licensee Responsible for Federal, State or Local Permits/Licenses The licensee is responsible for obtaining any and all necessary, corresponding Federal, State or local permits or licenses prior to conducting any activity authorized pursuant to this license.

4. GC – Reasons for Revocation This license may be revoked for any of the following reasons:

i. licensee provided materially false or inaccurate statements in his or her application, supporting documentation or on required reports;
ii. failure by the licensee to comply with any terms or conditions of this license;
iii. licensee exceeds the scope of the purpose or activities described in his or her application for this license;
iv. licensee fails to comply with any provisions of the NYS Environmental Conservation Law, any other State or Federal laws or regulations of the department directly related to the licensed activity;
v. licensee submits a check, money order or voucher for this license or application for this license that is subsequently returned to the department for insufficient funds or nonpayment after the license has been issued.

5. GC – Licensee Shall Carry Copy of License The licensee shall carry a copy of this license or a document provided by the department, if relevant, when conducting activities pursuant to this license.

6. GC – Licensee Shall Notify of Change of Address The licensee shall notify the Special Licenses Unit in writing, by mail or email, within five (5) days of the official change of residence.

7. GC – Licensee is Liable for Designated Agents If designated agents are authorized pursuant to this license, the licensee shall be liable and responsible for any activities conducted by designated agents pursuant to this license or any actions by designated agents resulting from activities authorized by this license.

8. GC – Licensee Renewal The licensee shall submit a written request for the renewal of this license prior to the expiration date listed on the license. The licensee shall include accurate and complete copies of any required reports with their renewal request. This renewal paperwork shall be sent to:

NYSDEC
Special Licenses Unit
625 Broadway
Albany, NY 12233-4752.

This license is deemed expired on the date of expiration listed on the license.

NOTIFICATION OF OTHER LICENSEE OBLIGATIONS

MN– Licensee is Liable
The licensee shall be liable and responsible for any activities conducted under the authority of this license or any actions resulting from activities authorized by the license.

MN – Access by Department Representatives
The licensee shall allow representatives of the department to enter upon the licensed premises to inspect their operations and records for compliance with license conditions.

Trespassing Prohibited
This license is not a license to trespass. The licensee shall obtain permission from the appropriate landowner/land manager prior to conducting activities authorized pursuant to this license

NATIVE ENDANGERED & THREATENED SP. RECOVERY

Permit Number: ES72093B

Version Number: 3

Effective: 2021-10-13 **Expires:** 2025-12-31

Issuing Office:

Department of the Interior

U.S. FISH AND WILDLIFE SERVICE

ES Bloomington Permit Office
5600 American Boulevard, West, Suite 990
Bloomington, Minnesota 55437-1458
permitsR3ES@fws.gov

Digitally signed by

FWS T&E Chief

Permittee:

Rebecca Winterringer

521 SYCAMORE DRIVE

EUCLID, OH 44132

US

Authority: Statutes and Regulations: 16 U.S.C. 1539 (a), 16 U.S.C. 1533 (d) 50 CFR 17.22, 50 CFR 17.32, 50 CFR 13

Location where authorized activity may be conducted:

See conditions and requirements

Reporting requirements:

Reports are due on January 31 following each year this permit is in effect.

Authorizations and Conditions:

NATIVE ENDANGERED & THREATENED SP. RECOVERY

Permit Number: ES72093B

Version Number: 3

Effective: 2021-10-13 **Expires:** 2025-12-31

A. General Conditions set out in Subpart B of 50 CFR 13, and specific Conditions contained in Federal regulations cited above, are hereby made a part of this permit. All activities authorized herein must be carried out in accord with and for the purposes described in the application submitted. Continued validity, or renewal of this permit is subject to complete and timely compliance with all applicable Conditions, including the filing of all required information and reports.

B. The validity of this permit is also conditioned upon strict observance of all applicable foreign, state, local, tribal, or other Federal law.

C. Valid for use by Rebecca Winterringer.

C.1. Unnamed assistants may work on permitted activities under the direct and on-site supervision of Rebecca Winterringer. “On-site supervision” is defined as having the Permittee at a distance close enough to enable immediate assistance to a supervised individual, as needed, while the supervised individual conducts an authorized activity.

D. Acceptance of this permit serves as evidence that the Permittee understands and agrees to abide by the terms of this permit and all sections of Title 50 Code of Federal Regulations, Parts 13 and 17, pertinent to issued permits (https://www.fws.gov/permits/ltr/ltr.html). Section 11 of the Endangered Species Act of 1973, as amended, provides for civil and criminal penalties for failure to comply with permit Conditions.

A request for permit renewal using Application Form 3-200-59 and the $100 application processing fee must be received **at least 30 days prior to the expiration date** of this permit to continue conducting authorized activities under the expired permit while your application is being processed (subject to compliance with 50 CFR, Parts 13.21 and 13.22: https://www.ecfr.gov/cgi-bin/text-idx?c=ecfr&sid=a1d34199d1ab36c8b78ecd06a7fa5180&tpl=/ecfrbrowse/Title50/50cfr13_main_02.tpl). When these requirements are not met, this permit becomes invalid on the expiration date. Please use https://fwsepermits.servicenowservices.com/fws to obtain specific information regarding the new ePermitting process to apply for and submit your digital recovery permit application and application processing fee. When these requirements are not met, this permit becomes invalid on the expiration date. *Unless otherwise instructed within the Authorizations and Conditions*, **annual reports** are due by January 31 following each year your permit is in effect and shall be submitted to all offices identified in the permit Conditions.

E. Permittee is authorized to take (only in the context of harass by survey - remove from substrate, handle, collect non-intrusive data/measurements, temporary hold, release) freshwater mussel species identified below for scientific research aimed at recovery of the species: presence/absence

NATIVE ENDANGERED & THREATENED SP. RECOVERY
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surveys, studies to document habitat use, population monitoring, and to evaluate potential impacts. This permit does **not** authorize the collection of voucher specimens.

Issuance of this permit does not constitute permission to conduct these activities on National Wildlife Refuges or any other public or private lands; such permission must be obtained separately from the appropriate landowner or land manager before beginning these authorized activities. This permit, neither directly nor by implication, grants the right of trespass.

A copy of this permit must be physically present on any person(s) conducting authorized activities. NOTE: This permit is limited to the activities and identified species authorized herein.

The following species are authorized:

- spectaclecase (mussel) (*Cumberlandia monodonta*)
- fanshell (*Cyprogenia stegaria*)
- snuffbox mussel (*Epioblasma triquetra*)
- Higgins' eye (pearlymussel) (*Lampsilis higginsii*)
- pink mucket (pearlymussel) (*Lampsilis abrupta*)
- sheepnose mussel (*Plethobasus cyphyus*)
- fat pocketbook (*Potamilus capax*)
- clubshell (*Pluerobema clava*)
- rayed bean (*Villosa fabalis*)
- rabbitsfoot (*Quadrula cylindrica cylindrica*)
- northern riffleshell (*Epioblasma torulosa rangiana*)
- purple cat's paw pearlymussel (*Epioblasma obliquata obliquata*)
- white catspaw (pearlymussel) (*Epioblasma obliquata perobliqua*)
- orangefoot pimpleback (pearlymussel) (*Plethobasus cooperianus*)
- speckled pocketbook (*Lampsilis streckeri*)
- scaleshell mussel (*Leptodea leptodon*)
- Neosho mucket (*Lampsilis rafinesqueana*)
- Dwarf wedgemussel (*Alasmidonta heterodon*)
- James spinymussel (*Pleurobema collina*)
- Appalachian monkeyface (*Quadrula sparsa*)
- birdwing pearlymussel (*Lexiox rimosus*)
- cracking pearlymussel (*Hemistena lata*)
- Cumberland bean (*Villosa trabalis*)
- Cumberland monkeyface (*Quadrula intemedia*)
- Dromedary pearlymussel (*Dromus dromas*)
- finerayed pigtoe (*Fusconaia cuneolus*)

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- fluted kidneyshell (*Ptychobranchus subtentum*)
- green blossom (*Epioblasma torulosa gubernaculum*)
- littewing pearlymussel (*Pegias fabula*)
- oyster mussel (*Epioblasma capsaeformis*)
- purple bean (*Villosa perpurpurea*)
- rough pigtoe (*Pleurobema plenum*)
- shiny pigtoe (*Fusconaia cor*)
- slabside pearlymussel (*Lexingtonia dolabelloides*)
- tan riffleshell (*Epioblasma florentina walker*)

F. Activities are authorized at the following locations:

F.1. Within the U.S. Fish and Wildlife Service (USFWS) Region 2 State: Oklahoma upon receipt of written concurrence from the Field Supervisor, as outlined in Condition G.

F.2. Within the USFWS Region 3 States: Illinois, Indiana, Iowa, Michigan, Minnesota, Missouri, Ohio, and Wisconsin upon receipt of written concurrence from the Field Supervisor, as outlined in Condition G.

F.3. Within the USFWS Region 4 States: Alabama, Arkansas, Kentucky, Louisiana, Mississippi, North Carolina, and Tennessee upon receipt of written concurrence from the Field Supervisor, as outlined in Condition G.

F.4. Within the USFWS Regional 5 States: Maryland, New Jersey, New York, Pennsylvania, Virginia and West Virginia upon receipt of written concurrence from the Field Supervisor, as outlined in Condition G.

F.5. Within the USFWS Regional 6 State: Kansas upon receipt of written concurrence from the Field Supervisor, as outlined in Condition G.

G. Permittee shall notify and request approval from the USFWS Field Supervisor at least 15 days prior to conducting any activities. Contact information is available at: https://www.fws.gov/midwest/endangered/permits/index.html. Your request for this site-specific approval must be in writing and must indicate:

G.1. Species for which proposed activities are being conducted.

G.2. Location of proposed activities, including project site, county, and state.

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G.3. A complete description of activities (i.e., proposed project plan, including purpose and need, surveys, methods, etc.).

G.4. Dates when the project is proposed to take place.

G.5. Evidence that Permittee has received any required contracts to complete the activities.

G.6. Whether all annual reporting requirements have been fulfilled.

You may proceed with only the activities described in your written concurrence letter, upon receipt from the applicable USFWS Field Supervisor. ***Your concurrence letter must be carried with this permit to authorize site-specific activities*.**

H. Permittee shall adhere to the following involving the capture and handling of freshwater mussel species:

H.1. Permittee is authorized to take (remove from the substrate by hand via wading, snorkeling, or diving) freshwater mussels identified in Condition E. to conduct presence/absence studies and surveys to monitor mussel communities.

H.2. Collection of live mussel specimens shall be done only when the air temperature is above 32° Fahrenheit (F) and the water temperature is above 40° F. **No** collection activities shall be conducted when air temperature is above 90° F.

H.3. Specimens shall be returned to the substrate unharmed within three (3) hours to the locality where taken as follows:

a. For surveys at water temperatures at or above 50° F, mussels may be dropped back into the water after identification;

b. For surveys conducted at water temperatures between 40° F and 49° F, Permittee shall return the mussels to the substrate by diving. Permittee shall return the specimens to the substrate by hand, placing them on their side and allowing them to burrow on their own. Where the substrate is very compacted cobble, the substrate shall be loosened, excavating a circular area just large enough to receive the animal to a depth of 3/4 of its length and the mussel placed into it with the siphon (posterior) end up and pointing upstream.

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H.4. Permittee may temporarily hold specimens in mesh bags, either suspended in the water or held in a container containing river water, while awaiting identification and data collection. Specimens shall be held for up to three (3) hours in the water in bags that allow free movement of water from which the mussels were taken or held in containers of water that is changed every hour (every half-hour when air temperatures are at or above 80^{o} F) and replaced with water freshly taken from where the mussels were collected. When practicable, specimens held in containers must remain in the shade. Live specimens that cannot be identified at the site must be photographed for identification purposes. Specimens shall be returned to substrate at the locality from which they were taken.

H.5. All live mussels shall be measured (length and height) and, if possible, sexed and aged. No intrusive activities are authorized. Data collected will include descriptions of external morphometry and reproductive status. All federally listed mussels or a representative sample for each species shall be photographed prior to return to the substrate.

H.6. No live specimens may be removed from the survey sites, except for specimens encountered in circumstances which would reasonably be expected to result in stranding due to low or receding water. Such specimens may be moved into deeper water at the survey site, to a suitable location near the survey site, or to an alternative location coordinated with, and approved by the appropriate USFWS Field Office as required by Condition G.

H.7. The shells of all live specimens collected must be thoroughly inspected for the presence of zebra mussels (*Dreissena polymorpha*). Unionids with zebra mussels attached must be cleaned by scrubbing prior to returning the specimens to the substrate. Permittee shall also document the incidence of zebra mussels and Asiatic clams (*Corbicula fluminea*) at project sites.

H.8. Equipment used to capture and handle mussel species shall be cleaned and decontaminated, including personal gear such as boots and gloves. Use of felt sole waders must be avoided whenever possible. Decontamination protocols, including use of felt sole waders, shall be reviewed and approved by the appropriate USFWS Field Supervisor as required by Condition G.

I. Upon determination that endangered or threatened freshwater mussel species are present at previously undocumented sites, Permittee shall notify the following USFWS offices within 48 hours: the Regional Minnesota office Recovery Permit Coordinator (Condition L.) and the USFWS Field Supervisor within the geographic location of study areas

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(https://www.fws.gov/midwest/endangered/permits/index.html). No voucher specimens may be collected. Any newly identified mussel species sites shall be vouchered with photographs and/or video recordings.

J. Accidental injury or mortality of federally listed freshwater mussel species may not exceed two (2) specimens. In the event that any accidental injury or mortality occurs, all activities must cease. The Permittee shall notify the applicable USFWS Field Supervisor in the state in which the incident occurred (contact information provided at: https://www.fws.gov/midwest/endangered/permits/index.html) in writing of any mussel mortality or injury within 24 hours. Written notification shall also be made within 48 hours to the Regional Minnesota office Recovery Permit Coordinator (Condition L.). The Permittee's statement must document the cause of the injury or mortality, and identify all remedial measures employed by the Permittee to eliminate future mortality or injury events. Based on consultation between the USFWS offices, decisions will be made regarding remedial measures that will be implemented and whether and/or when any of the authorized activities may continue. The USFWS Field Supervisor within the geographic location in which the incident occurred will provide a decision within five (5) business days concerning the disposition of any injured or dead specimen. Permitted activities may resume upon receipt of written approval from the USFWS Field Supervisor within the geographic location in which the incident occurred.

Any specimens that are moribund or freshly-dead and contain soft tissue shall be preserved according to standard museum practices, properly identified and indexed (collection site, UTM coordinates or lat/long, site conditions when collected, date collected, and permit authorizing collection). All specimens retained under this permit remain the property of the United States Government and must clearly be identified as such. Any mussels that are not authorized for retention are to be chilled and promptly transferred to the USFWS Field Supervisor within the geographic location of study areas for potential necropsy and/or contaminants analysis.

K. An Annual Report of all activities conducted under the authority of this permit is due by January 31 following **each year** this permit is in effect. In addition, copies of all publications and reports resulting from work conducted under this permit must be submitted as they become available. Failure to furnish any reports required by this permit is cause for permit revocation and/or denial of future permit applications. At a minimum, your report shall include:

K.1. A complete discussion of field procedures, data collection methods, results, and conclusions.

K.2. The date, time, and locations (state, county, locality, UTM coordinates or GIS data with projection information) where each listed and/or candidate species was encountered and the location it was returned.

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K.3. The locations of the surveyed sites where no listed species were located.

K.4. Habitat conditions at sites where threatened or endangered specimens were collected, including: water depth, substrate composition, sedimentation, and any other relevant data.

K.5. The size, age, sex and condition (if determinable) of any individuals encountered.

K.6. Any identification numbers or marks added to live specimens.

K.7. A complete description of injuries and/or mortalities to listed species while in your possession, the dates of occurrence, location where incident occurred, disposition of the species, any circumstances surrounding the incidents, and a description of any steps taken to reduce the likelihood that such injuries and/or mortalities will occur in the future.

K.8. Any other data you may have collected for individual naiads, such as evidence of damage or injury, and observations of zebra mussel (*Dreissena polymorpha*) and/or Asiatic clam (*Corbicula fluminea*) infestation.

K.9. Copies of any separate reports and/or publications resulting from work conducted under the authority of this permit.

K.10. Photographs of the identifying characteristics for each individual federally-listed species captured are encouraged. The Permittee may be requested to provide individual photographs after submittal of annual reporting data.

K.11. Data for all mussels surveyed and include, but not be limited to, the data requested in any automated or species-specific data form provided by the USFWS. If a form is not provided by the USFWS, submit legible photocopies of all field data sheets for all species collected and a digital copy of any photographs of mussel specimens taken for species identification during your surveys.

K.12. Copies of all site specific authorization letters required under Condition G.

K.13. The “3-2523_USFWS Freshwater Mussel Reporting Form“ is required for reporting data and can be found on the FWS Midwest Permits website (https://www.fws.gov/midwest/endangered/permits/index.html). Prior to reporting, check the permits website to ensure you are using the most up to date form. Using the reporting form will help standardize data collection and increase efficiency in reporting.

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IF NO ACTIVITIES OCCURRED OVER THE COURSE OF THE YEAR, INDICATION OF SUCH SHALL BE SUBMITTED AS AN ANNUAL REPORT.

L. Copies of your reports shall be sent to **all applicable offices** indicated below. Your transmittal letter (or email) must cite your Federal permit number. Electronic copies shall be submitted in MS Word, Portable Document Format, Rich Text Format, or other file format that is compatible with the receiving office (**thumb drives/flash drives cannot be accepted**).

L.1. Regional Recovery Permit Coordinator
U.S. Fish and Wildlife Service
Ecological Services - Endangered Species
5600 American Blvd. W., Suite 990
Bloomington, Minnesota 55437-1458
(612/713-5343; fax 612/713-5292)
permitsR3ES@fws.gov

L.2. Regional Recovery Permit Coordinator
U.S. Fish and Wildlife Service
Division of Classification & Recovery Permits
P.O. Box 1306
Albuquerque, New Mexico 87103-1306
(505/248-6420; fax 505/248-6922)
permitsR2ES@fws.gov

L.3. Regional Recovery Permit Coordinator
U.S. Fish and Wildlife Service
Endangered Species Permits
1875 Century Blvd.
Atlanta, Georgia 30345-3301
(404/679-7097; fax 404/679-7081)
permitsR4ES@fws.gov

L.4. Regional Recovery Permit Coordinator
U.S. Fish and Wildlife Service
Endangered Species Division
300 Westgate Center Drive
Hadley, Massachusetts 01035-9589
(413/253-8212; fax 413/253-8482)

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permitsR5ES@fws.gov (mailto:permitsR5ES@fws.gov)

L.5. Regional Recovery Permit Coordinator
U.S. Fish and Wildlife Service
Endangered Species Division
134 Union Blvd.
Lakewood, Colorado 80228
permitsR6ES@fws.gov (mailto:permitsR5ES@fws.gov)

M. Additionally, based on geographic areas, reports and publications shall be submitted to the applicable offices under “For Fish and Wildlife Permit Holders” at: https://www.fws.gov/midwest/endangered/permits/index.html.

cc: FWS/Regional Offices - Georgia, Massachusetts, and New Mexico (Attn: Regional Recovery Permit Coordinator)
FWS, TE Coordinator: Illinois/Iowa, Indiana, Michigan, Minnesota/Wisconsin, Missouri, Ohio
DNR/DOC, TE Coordinator: Illinois, Indiana, Michigan, Missouri, Ohio

END

Appendix B

Photo Record

2022 One-Year Post Construction Monitoring
Indirect Effects Areas, Allegheny River, Cattaraugus County, NY
Photographed September 17, 2022

Photo 1. View facing north looking at the right descending bank of the remediated direct effects area.

Photo 2. View of Plain Pocketbook (*Lampsilis cardium,* male) collected from the Indirect Effects Area.

Photo 3. View of Round Pigtoe (*Pleurobema sintoxia*) with CTI collected form the Indirect Effects Area.

Photo 4. View of Spike (*Eurynia dilatata*) collected form the Indirect Effects Area.

Photo 5. View of Rayed Bean (*Villosa fabalis) c*ollected from the Indirect Effects Area.

Photo 6. View of Looking upstream from the lateral Indirect Effects Area.