



The Dow Chemical Company
Midland, MI 48674

March 28, 2023

Ms. Colleen Moynihan
Remediation Project Manager
U.S. Environmental Protection Agency, Region 5
Cleveland Office
25063 Center Ridge Road
Westlake, OH 44145

**Re: Revised Advisory Sign Survey and Inventory Tech Memorandum
Settlement Agreement No. V-W-10-C-942
The Tittabawassee River/Saginaw River and Bay Site
Dow Submittal Number: 2023.011**

Ms. Moynihan:

Attached please find the revised Advisory Sign Survey and Inventory Tech Memorandum (Tech Memo). This Tech Memo was developed in accordance with Settlement Agreement No. V-W-10-C-942 (2010 AOC). Please let me know if you have any questions or concerns.

Sincerely,

A handwritten signature in blue ink, appearing to read "J Strunk".

James F. Strunk, Jr.
Authorized Representative
The Dow Chemical Company
Project Coordinator

CC: Daniel Dailey, EGLE
Diane Russell, U.S. EPA
Lisa Williams, U.S. Fish and Wildlife

ADVISORY SIGN SURVEY AND INVENTORY
TECHNICAL MEMORANDUM



Prepared by:
Tittabawassee and Saginaw River Team

Prepared for and submitted by:
The Dow Chemical Company

March 2023
Rev 1

Dow Submittal Number: 2023.011

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Acronyms and Abbreviations

AOC	Administrative Settlement Agreement and Order on Consent
DU	decision unit
EGLE	Michigan Department of Environment, Great Lakes, and Energy
GDIWP	General Design and Implementation Work Plan
ICS	incremental composite sampling
IRA	Interim Response Activities
ppt	parts per trillion
SOW	Statement of Work
SWAC	surface-weighted average concentration
TEQ	toxic equivalence
USEPA	United States Environmental Protection Agency

1 Introduction

This technical memorandum was prepared in accordance with the *Administrative Settlement Agreement and Order on Consent* (AOC; USEPA 2010) for The Tittabawassee River/Saginaw River & Bay Site (“Site”) (Settlement Agreement No. V-W-10-C-942), and Section 3 of the Statement of Work (SOW; Attachment A of AOC), effective January 21, 2010 (“Settlement Agreement”) (2010 AOC). The United States Environmental Agency (USEPA) requested that The Dow Chemical Company (Dow) conduct a survey to inventory soil advisory signage present at public parks and areas where the public may be accessing the Tittabawassee River. This technical memorandum summarizes the results of the survey.

2 Background

Interim Response Activities (IRAs) have been conducted since 2004 for the Tittabawassee River Floodplain under the regulatory authority of Part 111, Hazardous Waste Management, of the Natural Resources and Environmental Protection Act, 1994 PA 451 as amended, as required by Dow’s Hazardous Waste Management Facility Operating License. An IRA activity was conducted with the primary objective to develop, place, and maintain signs advising the public of the potential for exposure to dioxins and furans at public parks, unofficial public high use areas and public access fishing sites. The advisory signs were placed prior to a comprehensive sampling effort on the Tittabawassee River from 2006 to 2009 and the development of preliminary remedial goals by USEPA and EGLE. Parks that were identified by Michigan Department of Environment, Great Lakes, and Energy (EGLE, formerly Michigan Department of Environmental Quality) for the placement of signs include Imerman Memorial Park, West Michigan Park, Freeland Festival Park, Caldwell Boat Launch, Center Road Boat Launch, Greenpoint Nature Center, and Shiawassee National Wildlife Refuge. EGLE has also identified “unofficial high public use” areas for placement of signs, including Dice Road pumping station, Smith’s Crossing area, Dow-owned property along the Tittabawassee River that is accessible for fishing, and the former Germania Golf Course. The signs were intended to inform the public of potentially contaminated media (e.g., sediments, soils, fish) in areas that are used by the public. These signs were developed by EGLE and Michigan Department of Health and Human Services and are intended to provide simple, clear and accurate information that would allow the public to make informed personal decisions regarding potential exposure to existing contamination while the investigations and cleanups were initiated by Dow and USEPA.

Following the 2010 AOC, advisory signs and community education transitioned to USEPA oversight under Task 3 of the SOW. As a result, USEPA requested that Dow conduct an inventory of advisory signage for the Tittabawassee River in public parks and public use areas.

3 Summary of Floodplain Evaluation of Public Use Areas

All public parks and public use areas along the Tittabawassee have been evaluated under the 2015 Floodplain AOC. The properties were evaluated under the Segment-Specific Work Plans for each floodplain segment.

3.1 Inventory and Location of Advisory Signs

The public park/public use areas identified in the IRA Work Plan are listed below along with the segment location and property identification number.

- Public Parks
 - Caldwell Boat Launch, Segment 2 (S2_02_DU02)
 - Freeland Festival Park, Segment 3 (S3_095_DU01)
 - Imerman Memorial Park, Segment 5 (S5_02-03_DU01 through DU04)
 - West Michigan Park, Segment 7 (S7_001_DU01)
 - Center Road Boat Launch, Segment 7 (S7_025_DU01)
 - Greenpoint Nature Center, Segment 7 (S7_056_DU01 through 04)
 - Shiawassee National Wildlife Refuge, Segment 7 (S7_120-123_DU01 through DU25)
- Other public use areas
 - Dow-owned property along the Tittabawassee River that is accessible for fishing, Segment 2 (S2_01_DU01)
 - Smith's Crossing area, Segment 2 (S2_10-13_DU01 through DU21)
 - Dice Road pumping station, Segment 4 (S4_111_DU01)
 - Former Germania Golf Course, Segment 7 (S7_051a_DU01 though DU04)

Signs were also located in additional locations beyond those identified in the IRA Work Plan. All areas where advisory signs were located are included in Table 1 and shown on Figures 1 through 8. A summary of the results of the evaluation for each public use area is provided in Appendix A along with the Tittabawassee River Floodplain Evaluation Flow Chart.

3.2 Inventory and Results

In November and December 2021 Dow conducted a survey to identify the locations and types of advisory signs present in public use areas along the Tittabawassee River. Areas surveyed included public parks and known public use areas which were identified during IRA activities. The survey was conducted during leaf off conditions so that the signs could be located easier. Each location was visited, and a survey was conducted by foot to locate advisory signs. A summary of the location and sign types is provided in Table 1 and depicted on Figures 1 through 8. During the survey it was noted that contact information currently present on the advisory signs is out of date.

3.3 Results of Evaluation under the 2015 Floodplain AOC

The General Design and Implementation Work Plan (GDIWP) (Dow 2015) established a set of decision rules for the assessment and remediation process for floodplain properties. Decisions are based on current land use (i.e., maintained residential or other), and land use was (and continues to be) verified as part of the process. Decision Units (DUs, i.e., areas where individual remedial decisions are made) are assigned for each property based on its land use and area. A surface-weighted average concentration (SWAC) based on existing data is then estimated for each DU to determine whether additional sampling is required. A DU is further evaluated by incremental composite sampling (ICS) if its SWAC is greater than 90 parts per trillion toxic equivalence [ppt TEQ] for maintained residential land use or 1,600 ppt TEQ for other land use. Remedy is completed on a DU if the ICS result is greater than 200 ppt TEQ (maintained residential land use) or 2,000 ppt TEQ (other land use).

All properties identified in this Tech Memo were evaluated following the GDIWP. All properties were classified as other land use. None of the properties required sampling or cleanup as outlined in the GDIWP. Appendix A provides the Tittabawassee River Floodplain Evaluation Flow Chart, a table summarizing the results of the evaluation, and figures depicting the properties and associated DUs.

4 Summary and Recommendations

The results of the survey identified soil contact advisory signs within most of the public access areas. All the public access areas along the Tittabawassee River have been evaluated under the 2015 AOC for the Tittabawassee Floodplain. Results of those evaluations have not identified any public access areas within the Tittabawassee River floodplain that require floodplain remedy. Based upon those evaluations, Dow recommends that soil contact advisory signage should be removed from public access areas. Dow will work with the USEPA to develop a communication strategy for communicating with the municipalities regarding these changes to advisory signs in public parks.

5 References

Dow. 2015. Tittabawassee River Floodplain General Design and Implementation Work Plan. June 15, 2015.

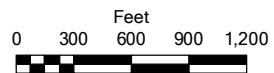
USEPA. 2010. Administrative Settlement Agreement and Order on Consent for Remedial Investigation, Feasibility Study and/or Engineering Evaluation and Cost Analysis, and Response Design. CERCLA Docket No. V-W-10-C-942. The Tittabawassee River/Saginaw River and Bay Site. Effective Date: January 21, 2010.

USEPA. 2015. Administrative Settlement Agreement and Order on Consent for Removal Action. CERCLA Docket No. V-W-15-C-018. Tittabawassee River Eight-Year Floodplain of the Tittabawassee River, Saginaw River and Bay Site. Effective Date: January 8, 2015.

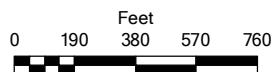
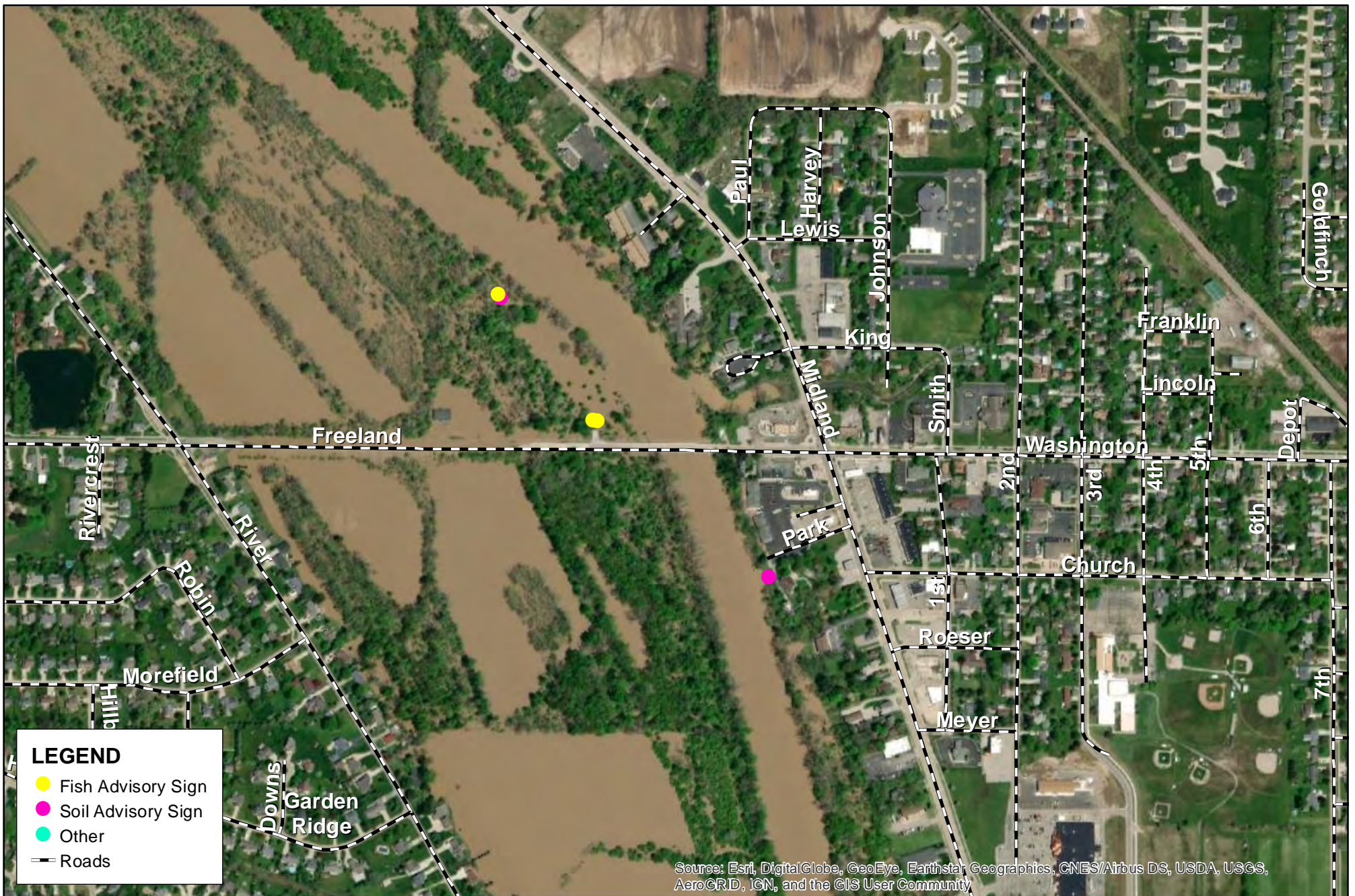
Table 1. Advisory Sign Survey-Tittabawassee River

Location	Date Observed	Sign Observed	Sign Condition	Photo Number	Notes	Coordinates (X, Y)		
Fishing Area upstream of Reach JK	12/2/2021	Soil Advisory (white)	fair	4448	N/A	-84.20531382	43.57932462	
		Fish Advisory	fair	4449		-84.20531172	43.57925144	
Reach JK	12/2/2021	Soil Advisory (white)	fair	4450	N/A	-84.20432392	43.57574341	
		Fish Advisory	good	4451		-84.20432718	43.57573327	
		Soil Advisory (white)	fair	4452		-84.20435962	43.57504406	
		Fish Advisory	fair	4453		-84.2043556	43.57504746	
		Contaminated soil Authorized Personnel Only	good	4454	There were multiple of these signs posted on containment fence - fence is falling over	-84.2032175	43.57387881	
Caldwell Boat Launch	12/2/2021	Soil Advisory (white)	poor	4455	N/A	-84.19613396	43.57194129	
		Fish Advisory	poor	4456		-84.19615231	43.57188157	
		Soil Advisory (white)	fair	4457	During leaf on, sign may be more hidden	-84.19594687	43.5718975	
		Fish Advisory	fair	4458	During leaf on, sign may be more hidden	-84.19541068	43.57145083	
		Fish Advisory	good	4459	N/A	-84.19512344	43.57030531	
		Soil Advisory (white)	fair	4460		-84.19561814	43.57032727	
		Fish Advisory	fair	4461		-84.19559726	43.57032514	
		Fish Advisory	good	4462		-84.19521924	43.57023562	
Smith's Crossing area	12/2/2021	None	NA	NA	NA	NA	NA	
Freeland Festival Park	12/2/2021	Fish Advisory	good	4463	N/A	-84.12702005	43.5253359	
		Fish Advisory	good	4464		-84.12709842	43.52535199	
		Soil Advisory (white)	poor	4465		-84.12871555	43.52691019	
		Fish Advisory	poor	4466	Sign in decent condition but posted far from any parking lot or traffic area	-84.12875997	43.52695411	
Dice Rd Pumping Station	12/2/2021	Fish Advisory	good	4467	N/A	-84.09617842	43.46594957	
Imerman Memorial Park	12/2/2021	Soil Advisory (white)	good	4468	N/A	-84.07902083	43.45837137	
		Soil Advisory (blue)	good	4469		-84.07880131	43.45847895	
		TR remediation and bank restoration	good	4470-4471	Unsure if phone numbers are accurate	-84.07872009	43.45853268	
		Soil Advisory (white)	good	4472	N/A	-84.07897021	43.45874445	
		Soil Advisory (white)	good	4473		-84.0790158	43.45777676	
		Soil Advisory (white)	good	4473		-84.07718285	43.45735515	
		Soil Advisory (white)	good	4475		-84.08137389	43.45352814	
		Soil Advisory (white)	good	4476		-84.08156952	43.45347261	
		Fish Advisory	good	4477		-84.08174001	43.45341708	
		Soil Advisory (white)	good	4478		-84.081882	43.45344842	
		Soil Advisory (white)	good	4479		-84.08185006	43.45366497	
		Soil Advisory (white)	good	4480		-84.0816561	43.45557663	
		Fish Advisory	good	4481		-84.08177882	43.45750476	
		Soil Advisory (white)	good	4482		-84.08170363	43.45767047	
		Fish Advisory	good	4483		-84.0818804	43.45786196	
Soil Advisory (white)	good	4484	-84.04618037	43.43750395				
Fish Advisory	good	4485	-84.04632135	43.43743995				
Soil Advisory (white)	good	4486	-84.04624256	43.43749159				
Fish Advisory	good	4487	-84.04628028	43.43767565				
Soil Advisory (white)	good	4488	-84.04839646	43.43733266				
Thomas Township welcome center	12/2/2021	Fish Advisory	good	4489	N/A	-84.04647022	43.41632321	
West Michigan Park	12/2/2021	Soil Advisory (white)	good	4490	N/A	-84.02911808	43.40214204	
		Fish Advisory	good	4491		-84.02913946	43.40214271	
		Soil Advisory (white)	good	4492		-84.029047	43.40140125	
		Fish Advisory	good	4493		-84.02905849	43.40137619	
		Soil Advisory (white)	good	4494		-84.02905983	43.40137912	
		Fish Advisory	good	4495		-84.02906142	43.40137661	
		Soil Advisory (white)	good	4496		-84.02905698	43.40138763	
		Fish Advisory	good	4497		-84.02905698	43.40138763	
		Soil Advisory (blue)	fair	4498		-84.02905698	43.40138763	
		Soil Advisory (white)	poor	4499		Near railroad tracks. Sign falling off post	-84.03202903	43.40281331
		Fish Advisory	poor	4500		Near railroad tracks. Sign hidden	-84.03181219	43.40274713
		Center Rd Boat Launch	12/2/2021	Soil Advisory (white)	fair	4501	N/A	-84.01734662
Fish Advisory	good			4502	-84.01741913	43.39519403		
Fish Advisory	good			4503	-84.01761652	43.39486349		
Soil Advisory (white)	good			4504	-84.01734595	43.39469485		
Fish Advisory	good			4505	-84.01689442	43.39456723		
Soil Advisory (blue)	good			4506	-84.01574853	43.39468676		
Freeland Memorial Park	12/14/2021	TR remediation and bank restoration	fair	4507	N/A	-84.1240371	43.52334776	
Germania Golf Course/SWNR	12/14/2021	Fish Advisory	good	4508	West side of road down walkway	-83.98572841	43.39515049	
Greenpoint Nature Center	12/14/2021	Fish Advisory	good	4509	N/A	-83.98377257	43.39248118	
		Soil Advisory (yellow)	good	4510		-83.98410877	43.3922783	

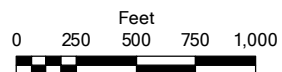
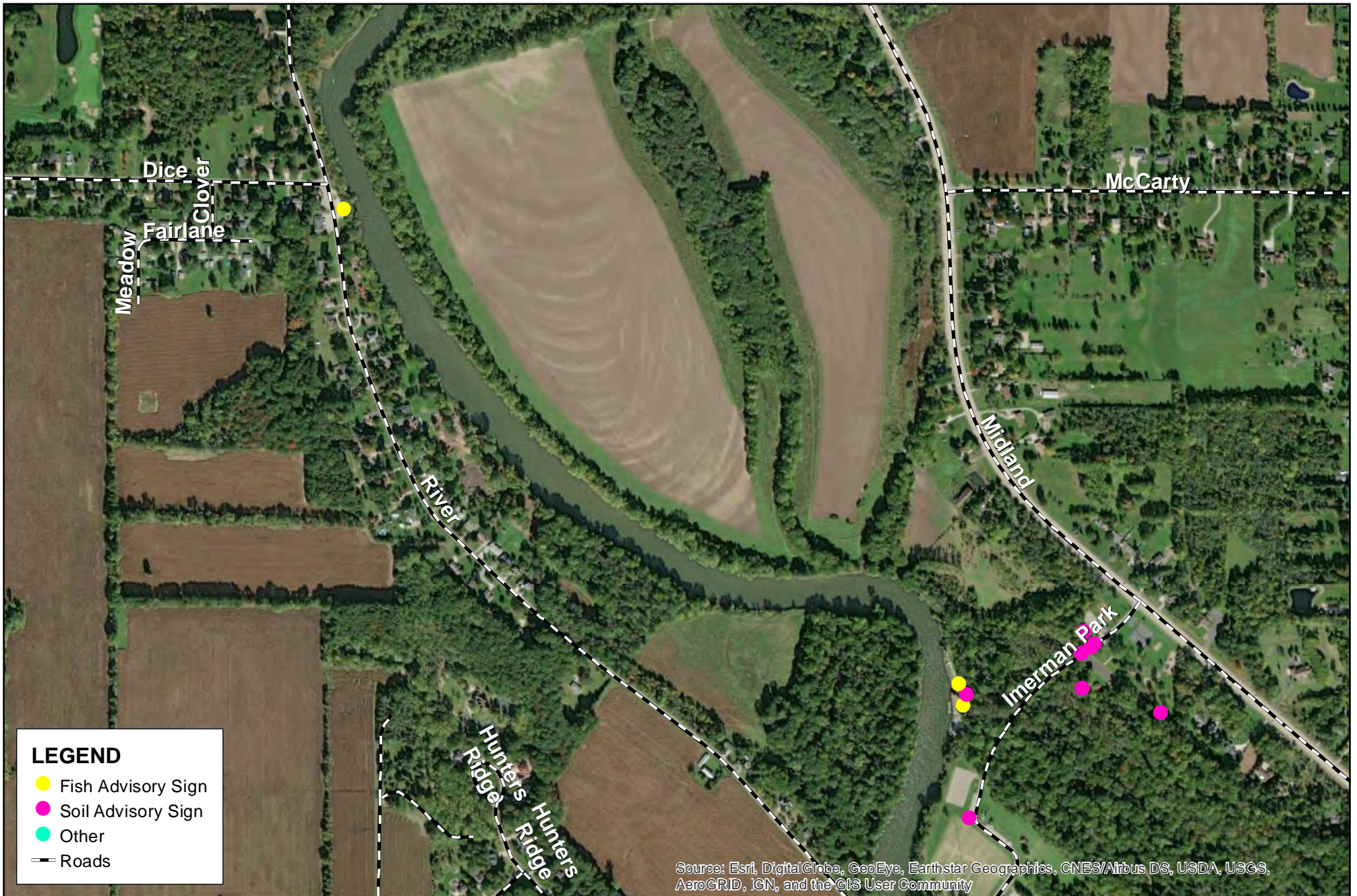
Sign condition:
 good: Sign is in good condition, is legible, and clearly posted
 fair: Sign has minor defects, fading, or is partially hidden
 poor: Sign is illegible, out of sight, or in non-working order



Reach JK and Caldwell Boat Launch
Advisory Sign Inventory Tech Memo

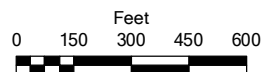
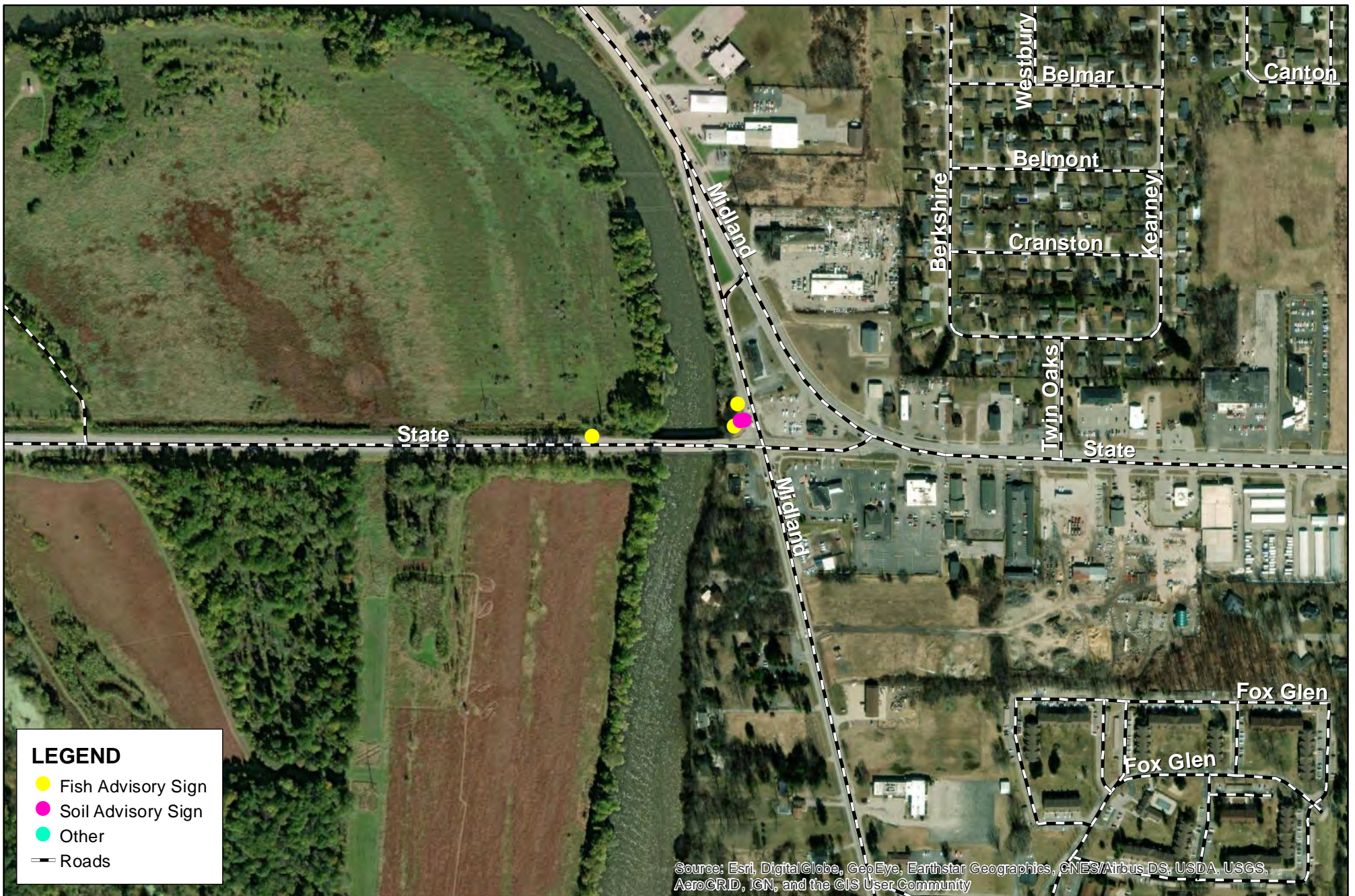


Freeland Festival Park
Advisory Sign Inventory Tech Memo

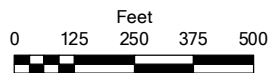
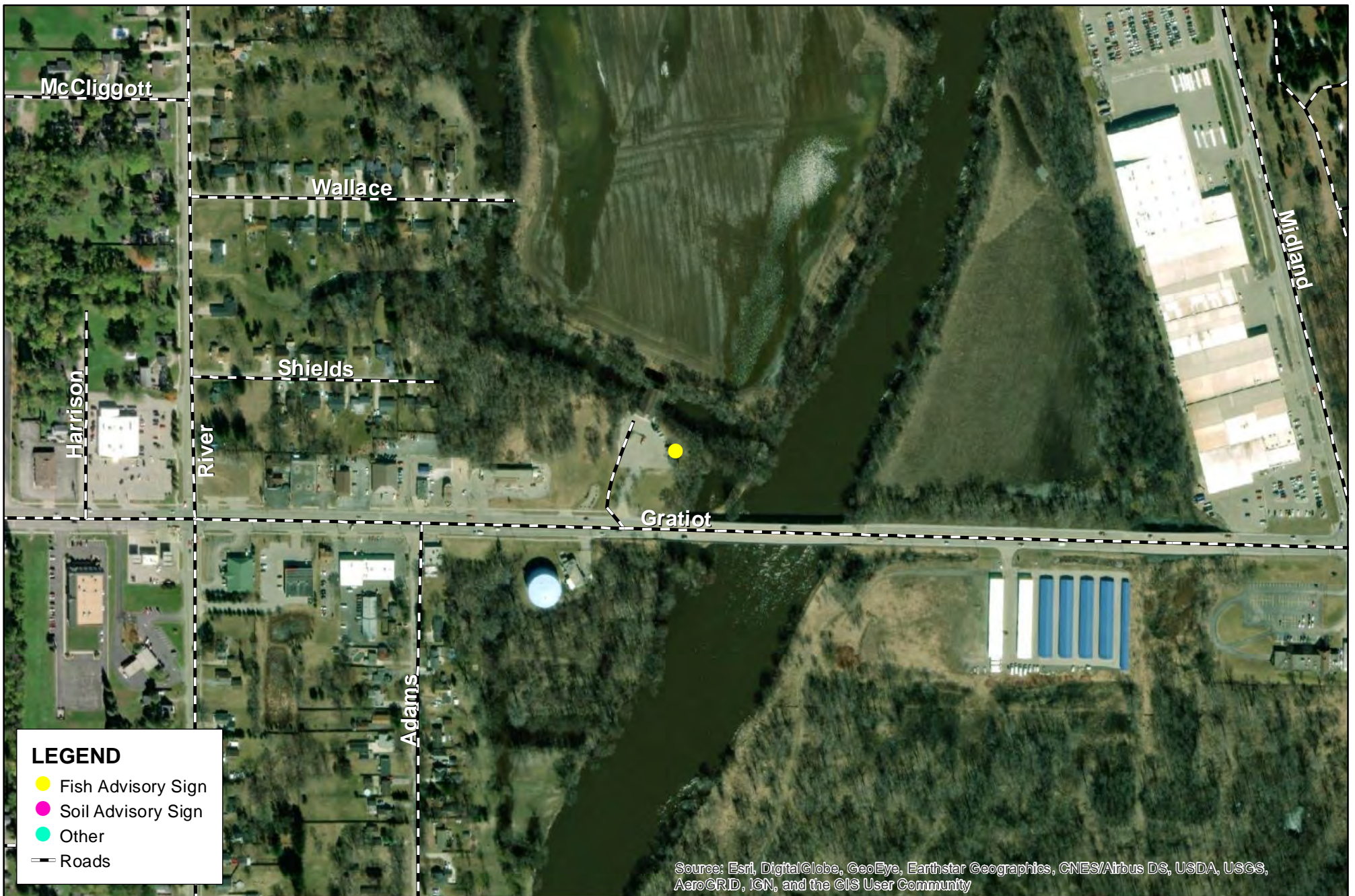


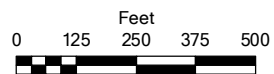
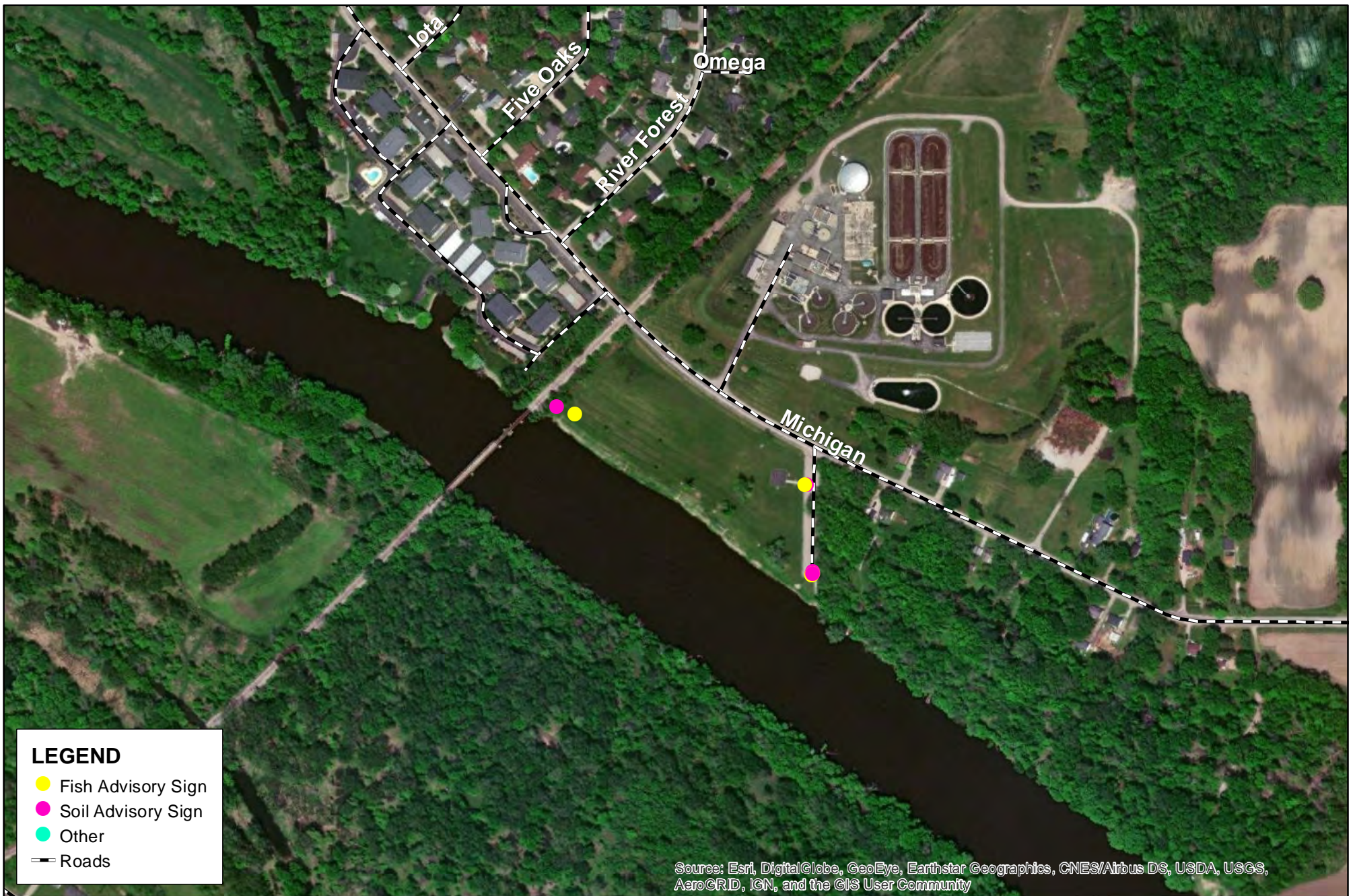
Imerman Park and Dice Road Pump Station

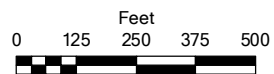
Advisory Sign Inventory Tech Memo

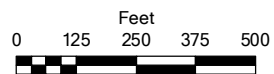
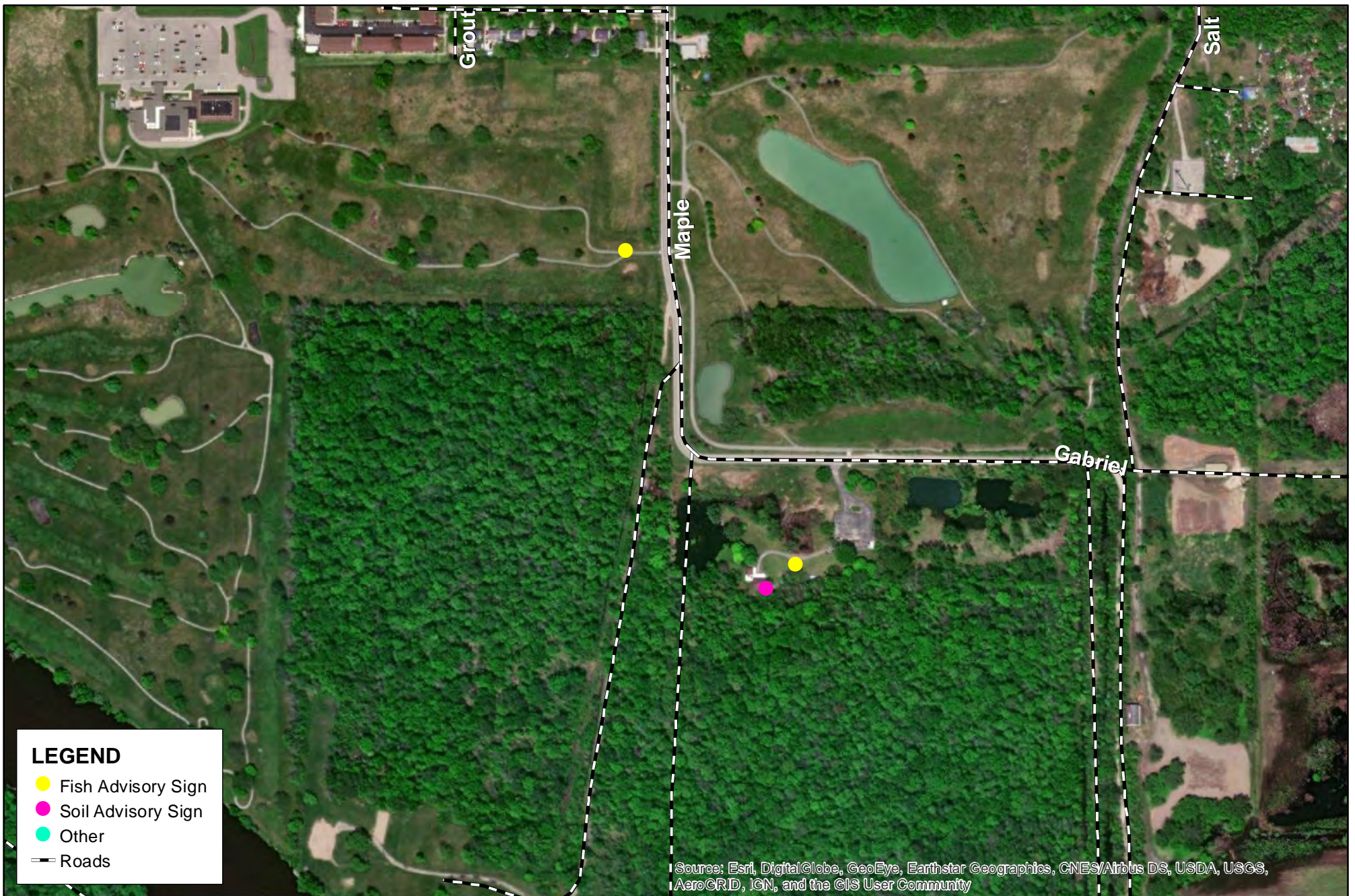


State Street and M47 Fishing Spot
Advisory Sign Inventory Tech Memo

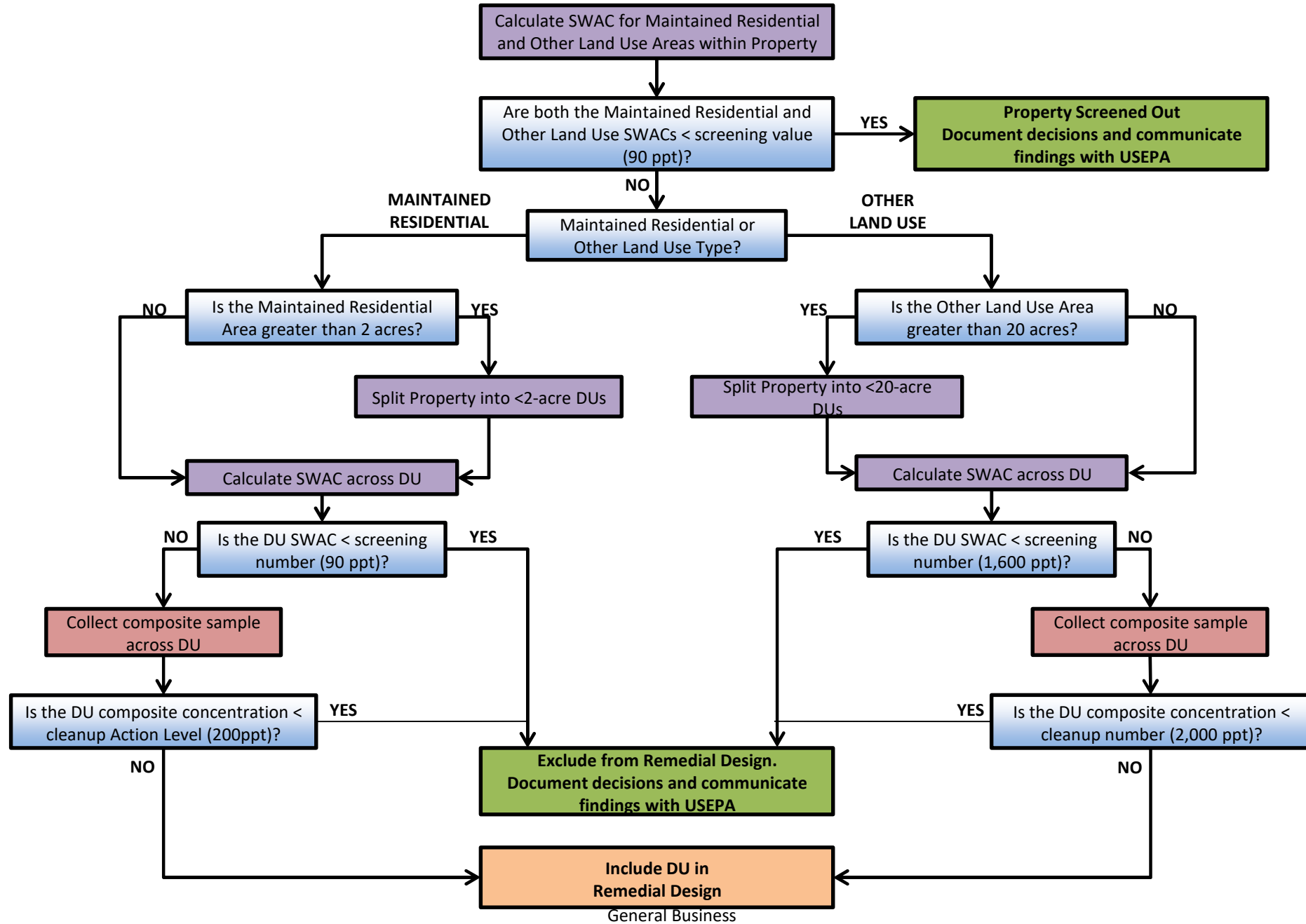








Tittabawasse River Floodplain Evaluation Process



Appendix A
Summary of Public Use Area Floodplain Evaluation

Property ID	DU ID	Maintained or Other?	DU Area (acres)	Current DU Concentration (ppt TEQ) ¹
SEGMENT 2				
S2_01	S2_01_DU01	Other	0.82	57 (SWAC)
S2_02	S2_02_DU02	Other	2.18	232 (ICS Result)
S2_10-13	S2_10-13_DU01	Other	20.07	622 (SWAC)
S2_10-13	S2_10-13_DU02	Other	20.06	1,101 (SWAC)
S2_10-13	S2_10-13_DU03	Other	20.09	874 (SWAC)
S2_10-13	S2_10-13_DU04	Other	20.05	390 (SWAC)
S2_10-13	S2_10-13_DU05	Other	20.12	332 (SWAC)
S2_10-13	S2_10-13_DU06	Other	20.07	286 (SWAC)
S2_10-13	S2_10-13_DU07	Other	20.05	266 (SWAC)
S2_10-13	S2_10-13_DU08	Other	20.11	649 (SWAC)
S2_10-13	S2_10-13_DU09	Other	20.06	1,244 (SWAC)
S2_10-13	S2_10-13_DU10	Other	20.08	781 (SWAC)
S2_10-13	S2_10-13_DU11	Other	20.09	674 (SWAC)
S2_10-13	S2_10-13_DU12	Other	20.11	435 (SWAC)
S2_10-13	S2_10-13_DU13	Other	20.13	408 (SWAC)
S2_10-13	S2_10-13_DU14	Other	20.11	452 (SWAC)
S2_10-13	S2_10-13_DU15	Other	20.10	453 (ICS Result)
S2_10-13	S2_10-13_DU16	Other	20.07	548 (SWAC)
S2_10-13	S2_10-13_DU17	Other	20.10	498 (SWAC)
S2_10-13	S2_10-13_DU18	Other	20.14	917 (SWAC)
S2_10-13	S2_10-13_DU19	Other	20.04	826 (SWAC)
S2_10-13	S2_10-13_DU20	Other	20.16	840 (SWAC)
S2_10-13	S2_10-13_DU21	Other	20.24	440 (SWAC)
SEGMENT 3				
S3_095	S3_095_DU01	Other	12.08	807 (SWAC)
SEGMENT 4				
S4_111	S4_111_DU01	Other	0.15	50 (SWAC)
SEGMENT 5				
S5_002-003	S5_002-003_DU01	Other	19.21	557 (SWAC)
S5_002-003	S5_002-003_DU02	Other	19.25	1,050 (SWAC)
S5_002-003	S5_002-003_DU03	Other	19.24	1,118 (SWAC)
S5_002-003	S5_002-003_DU04	Other	20.38	1,057 (SWAC)
SEGMENT 7				
S7_001	S7_001_DU01	Other	8.63	49 (SWAC)
S7_025	S7_025_DU01	Other	18.20	217 (SWAC)
S7_051a	S7_051a_DU01	Other	17.64	150 (SWAC)
S7_051a	S7_051a_DU02	Other	18.12	189 (SWAC)
S7_051a	S7_051a_DU03	Other	18.19	226 (SWAC)
S7_051a	S7_051a_DU04	Other	18.28	176 (SWAC)
S7_056	S7_056_DU01	Other	17.23	457 (SWAC)
S7_056	S7_056_DU02	Other	17.24	642 (SWAC)

Appendix A
Summary of Public Use Area Floodplain Evaluation

Property ID	DU ID	Maintained or Other?	DU Area (acres)	Current DU Concentration (ppt TEQ) ¹	
S7_056	S7_056_DU03	Other	17.31	632	(SWAC)
S7_056	S7_056_DU04	Other	17.30	441	(SWAC)
S7_120-123	S7_120-123_DU01	Other	18.65	97	(SWAC)
S7_120-123	S7_120-123_DU02	Other	19.88	220	(SWAC)
S7_120-123	S7_120-123_DU03	Other	20.35	221	(SWAC)
S7_120-123	S7_120-123_DU04	Other	19.92	222	(SWAC)
S7_120-123	S7_120-123_DU05	Other	20.00	271	(SWAC)
S7_120-123	S7_120-123_DU06	Other	20.05	319	(SWAC)
S7_120-123	S7_120-123_DU07	Other	20.06	383	(SWAC)
S7_120-123	S7_120-123_DU08	Other	19.48	470	(SWAC)
S7_120-123	S7_120-123_DU09	Other	19.96	464	(SWAC)
S7_120-123	S7_120-123_DU10	Other	20.05	288	(SWAC)
S7_120-123	S7_120-123_DU11	Other	20.04	226	(SWAC)
S7_120-123	S7_120-123_DU12	Other	20.01	217	(SWAC)
S7_120-123	S7_120-123_DU13	Other	19.97	201	(SWAC)
S7_120-123	S7_120-123_DU14	Other	20.00	175	(SWAC)
S7_120-123	S7_120-123_DU15	Other	20.01	155	(SWAC)
S7_120-123	S7_120-123_DU16	Other	20.01	166	(SWAC)
S7_120-123	S7_120-123_DU17	Other	20.08	207	(SWAC)
S7_120-123	S7_120-123_DU18	Other	20.02	235	(SWAC)
S7_120-123	S7_120-123_DU19	Other	20.03	322	(SWAC)
S7_120-123	S7_120-123_DU20	Other	20.04	377	(SWAC)
S7_120-123	S7_120-123_DU21	Other	20.07	392	(SWAC)
S7_120-123	S7_120-123_DU22	Other	20.15	355	(SWAC)
S7_120-123	S7_120-123_DU23	Other	19.96	279	(SWAC)
S7_120-123	S7_120-123_DU24	Other	20.14	291	(SWAC)
S7_120-123	S7_120-123_DU25	Other	20.32	205	(SWAC)

Notes:

1. Current DU concentration is given as the estimated SWAC where sampling has not yet been conducted in a DU, as the ICS result where sampling has been completed, but remedy has not been conducted.








DU: Decision unit

ICS: Incremental composite sampling

ppt TEQ: parts per trillion toxic equivalence

SWAC: Surface-weighted average concentration











General Information

-  8 Year Floodplain
-  Residential Maintained Areas
-  Parcel Boundary
-  Remedial Boundary
-  Selected Parcel Boundary
-  Selected Parcel Boundary
-  Selected DU Split Boundary





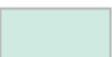



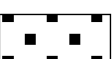


All parcel maps are oriented with north at the top of the page






Geomorphic Feature

-  Geomorphic Wetland
-  High Surface
-  Intermediate Surface
-  Low Intermediate Surface
-  Low Surface
-  Industrial Age Levee
-  Pre-Industrial Age Levee
-  Shoreline
-  Upland
-  Upper High Surface

SAC Surface TEQ (ppt)

-  ≤ 100
-  101-1000
-  1001-2000
-  2001-3000
-  3001-4000
-  4001-5000
-  > 5000
-  Proxy Areas – 2015 Extensions (see Note 1)
-  Proxy Areas – 2006-2008 (by ATS)

Sample Locations Surface TEQ (ppt)

-  ≤ 90
-  91-1000
-  1001-5000
-  5001-10000
-  > 10000

Notes:

1. Proxy values were assigned in 2015 to geomorphic polygons where the mapped 8-year floodplain boundary was identified outside the FEMA 100-year floodplain boundary (used as the outer boundary during the 2006-2008 site characterization work). A similar process was used to assign proxy concentrations as used by ATS.
2. SAC concentrations are indicated with black labels and sample concentrations are indicated with white labels in parcel maps as space permits.



Segment 2 Properties - Legend

Tittabawassee River Floodplain Post-Removal Site Control Plan

Figure
LEGEND

Area in 8-year Floodplain: 40.5 acres

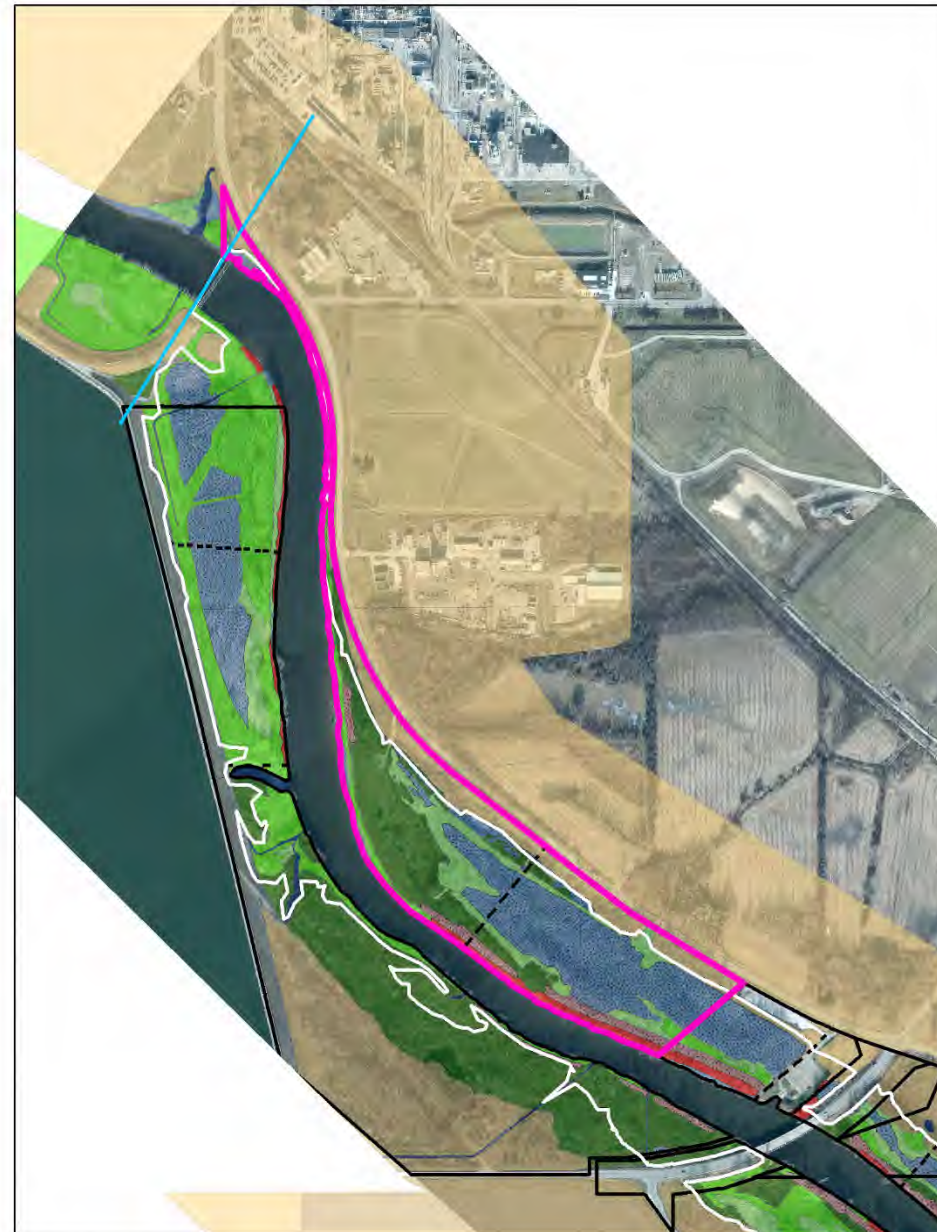
Area of Maintained Land in 8-Year Floodplain: 0.0 acres
Area of Other Land in 8-Year Floodplain: 40.5 acres

LAND USE VERIFIED

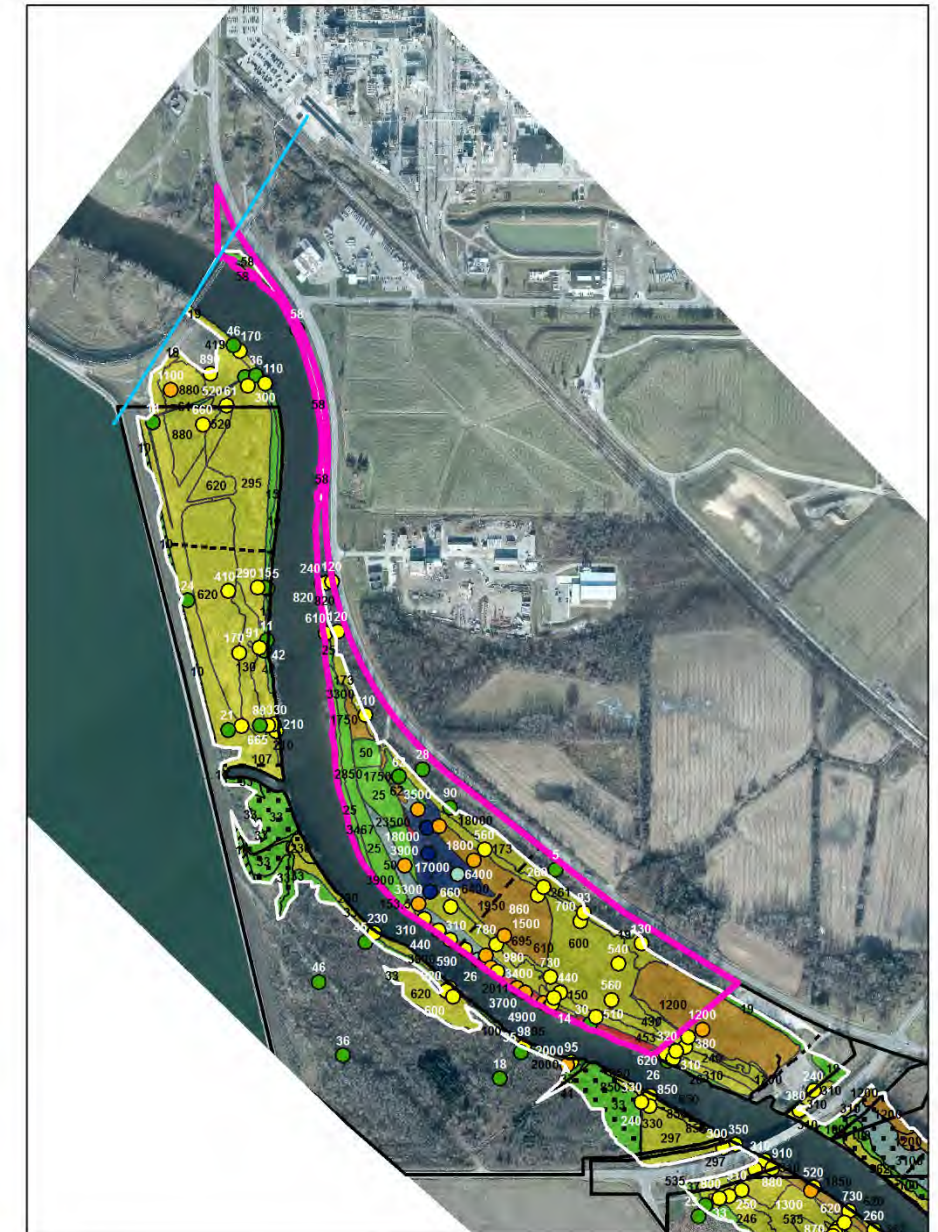
Aerial Background



Geomorphic Polygons



SAC Polygons and Existing Samples



Decision Unit ID – S2_01_DU01 through S2_01_DU03
Tittabawassee River Floodplain Post-Removal Site Control Plan

Figure
S2_01

Area in 8-year Floodplain: 40.5 acres

Area of DU: 0.8 acres

LAND USE VERIFIED

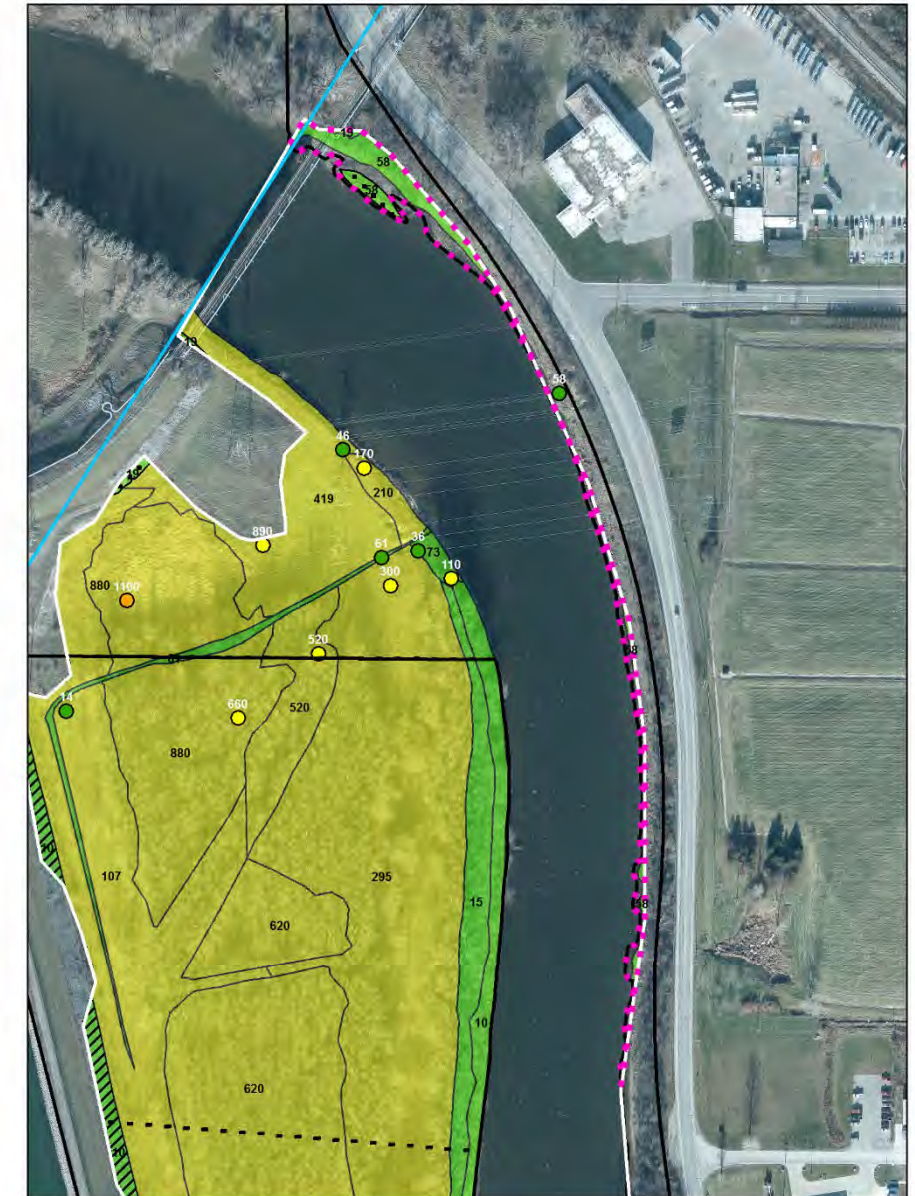
Aerial Background



Geomorphic Polygons



SAC Polygons and Existing Samples



Decision Unit ID – S2_01_DU01
Tittabawassee River Floodplain Post-Removal Site Control Plan

Figure
S2_01_1

Area in 8-year Floodplain: 9.5 acres

Area of DU: 7.3 acres

LAND USE VERIFIED

Aerial Background



Geomorphic Polygons



SAC Polygons and Existing Samples



Decision Unit ID – S2_02_DU01
Tittabawassee River Floodplain Post-Removal Site Control Plan

Figure
S2_02_1

Area in 8-year Floodplain: 421.5 acres

Area of Maintained Land in 8-Year Floodplain: 0.0 acres
Area of Other Land in 8-Year Floodplain: 421.5 acres

LAND USE VERIFIED

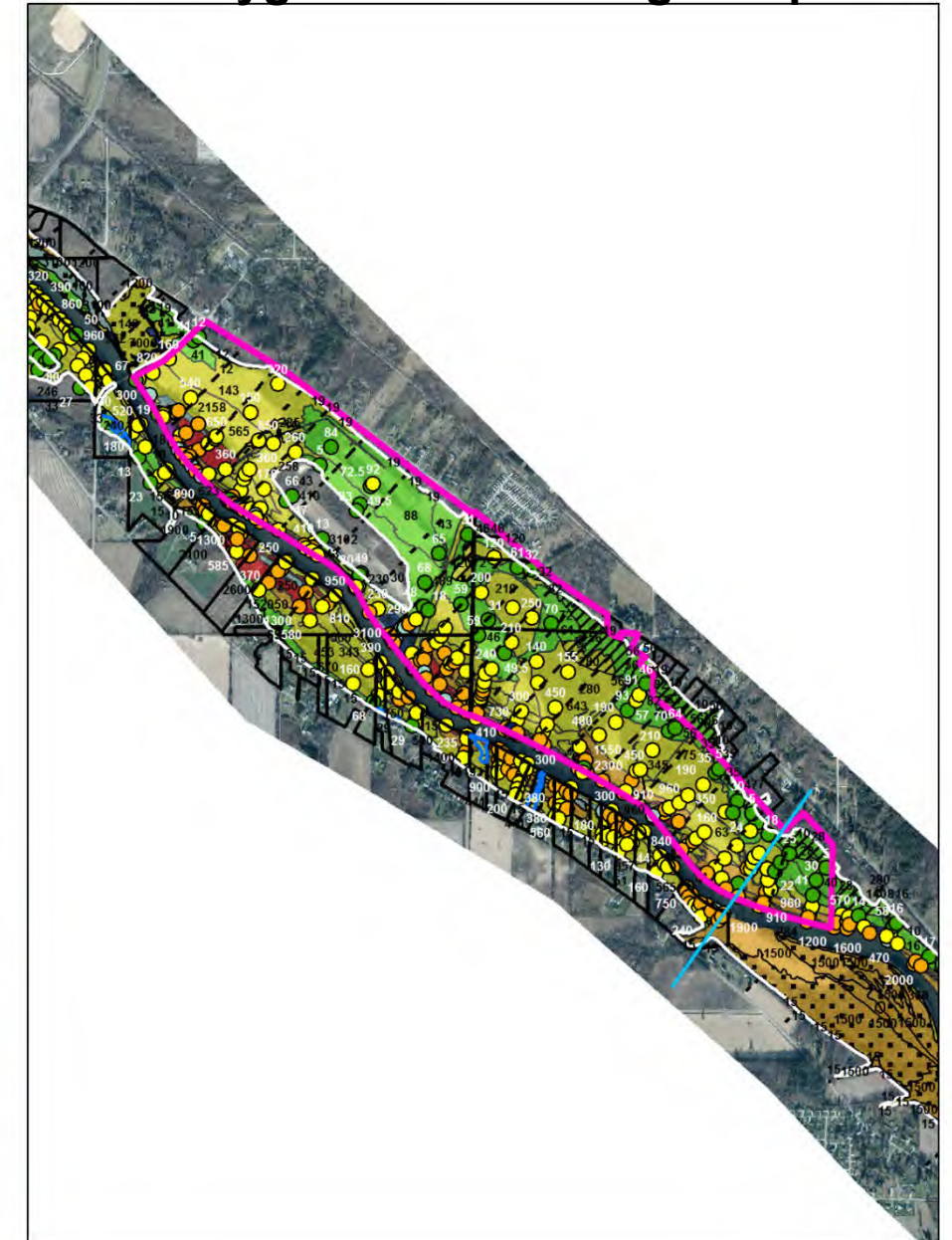
Aerial Background



Geomorphic Polygons



SAC Polygons and Existing Samples



Decision Unit ID – S2_10-13_DU01 through S2_10-13_DU21
Tittabawassee River Floodplain Post-Removal Site Control Plan

Figure
S2_10-13

Area in 8-year Floodplain: 421.5 acres

Area of DU: 20.1 acres

LAND USE VERIFIED

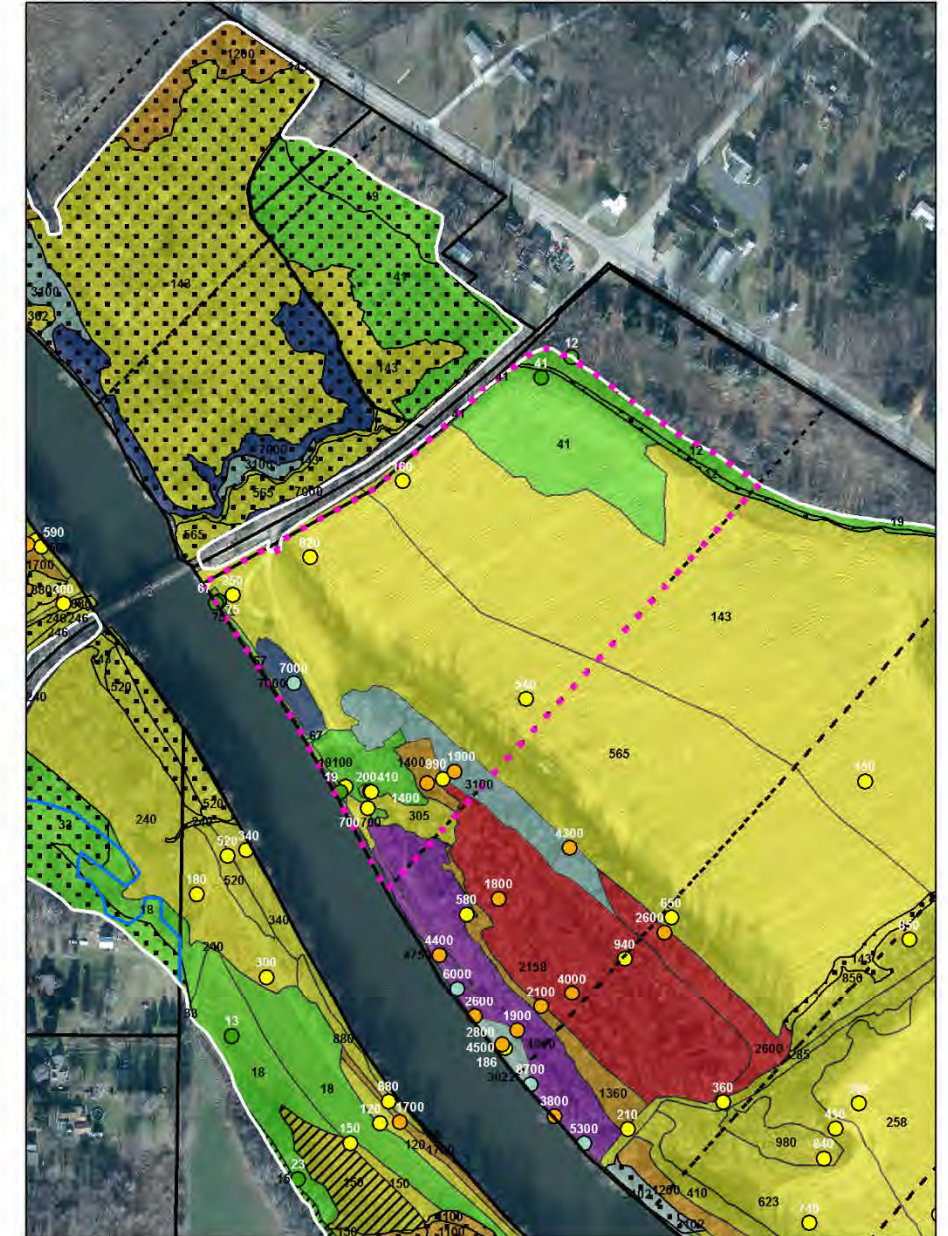
Aerial Background



Geomorphic Polygons



SAC Polygons and Existing Samples



S2_10-13_DU01
Tittabawassee River Floodplain Post-Removal Site Control Plan

Figure
S2_10-13_1

Area in 8-year Floodplain: 421.5 acres

Area of DU: 20.1 acres

LAND USE VERIFIED

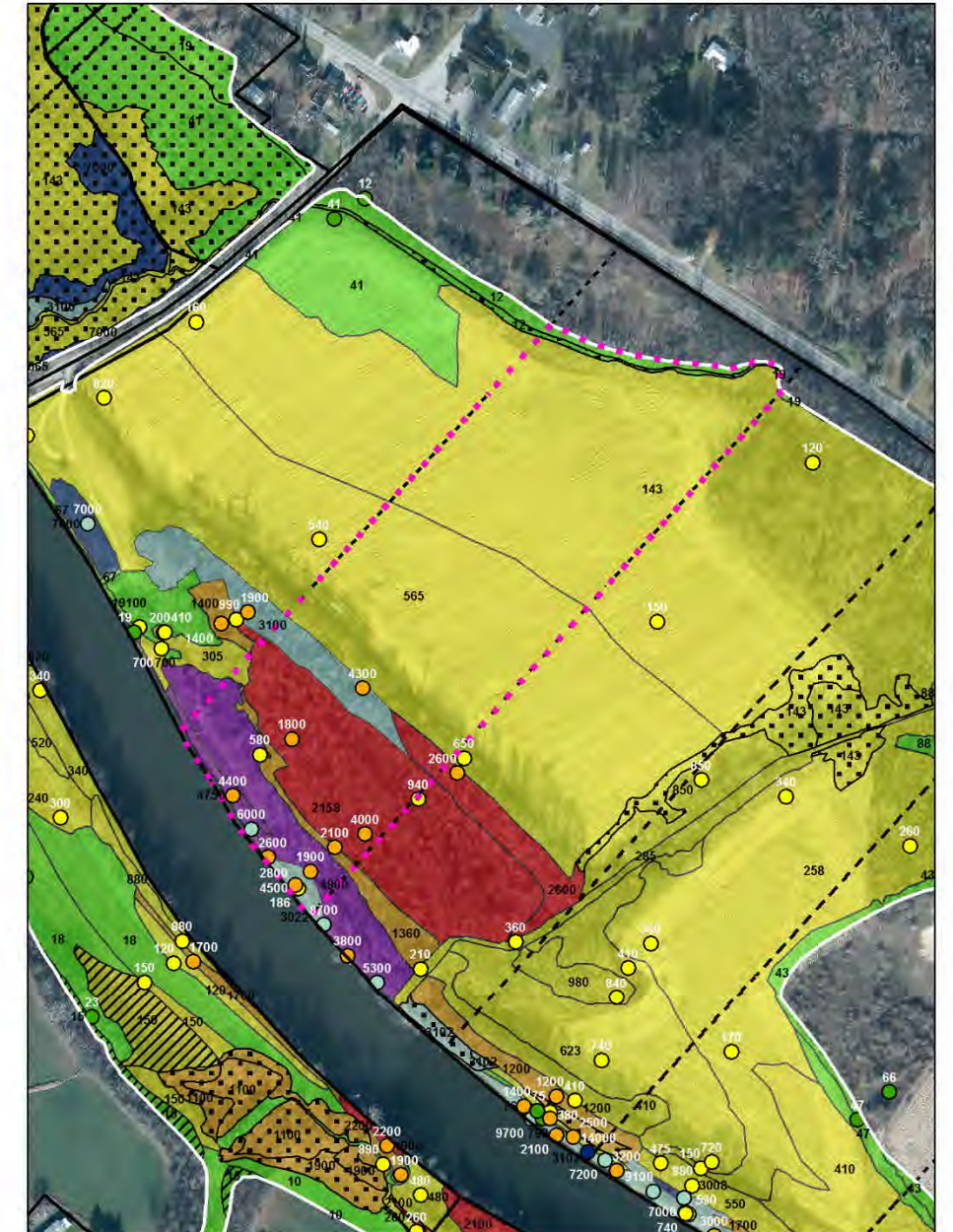
Aerial Background



Geomorphic Polygons



SAC Polygons and Existing Samples



Area in 8-year Floodplain: 421.5 acres

Area of DU: 20.1 acres

LAND USE VERIFIED

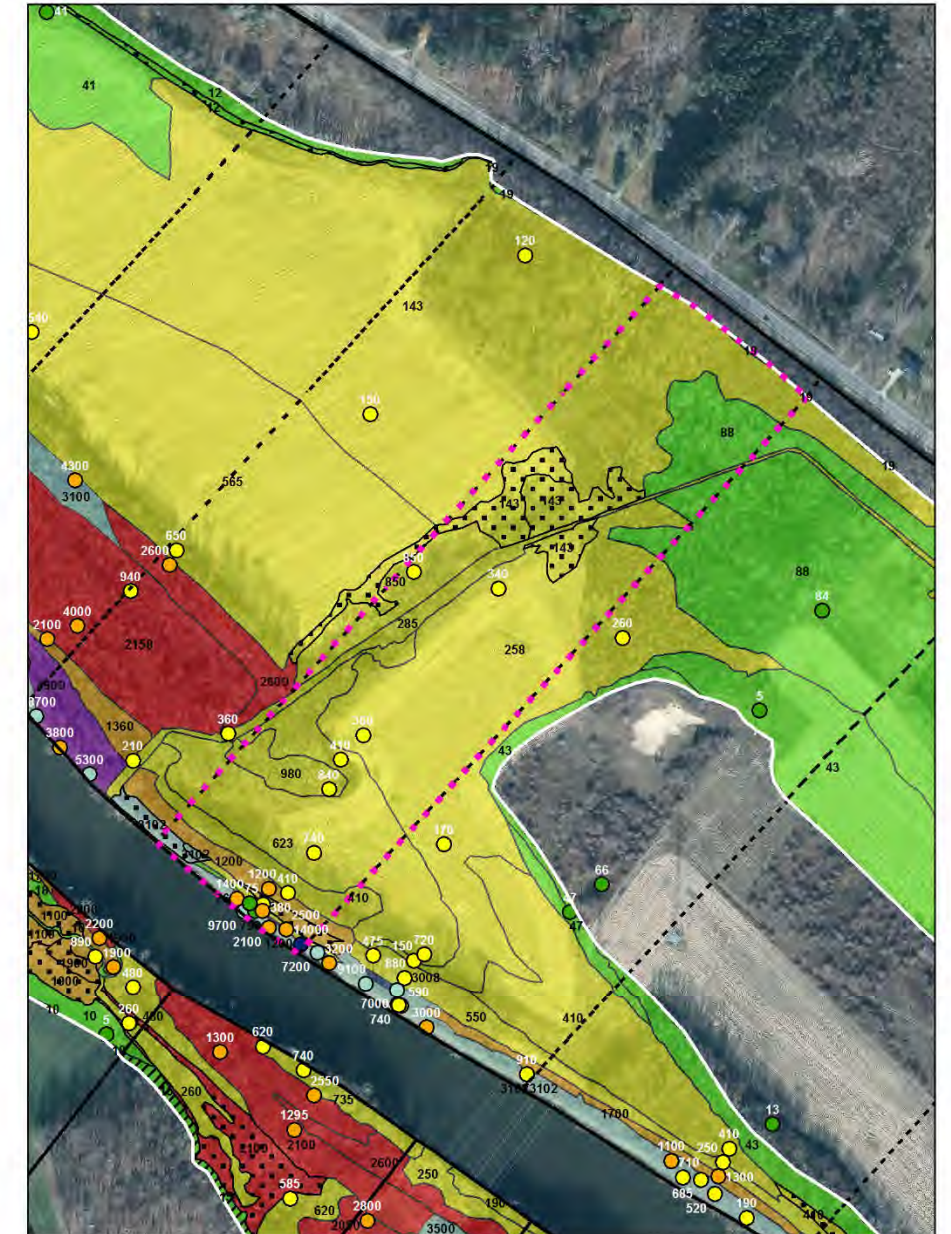
Aerial Background



Geomorphic Polygons



SAC Polygons and Existing Samples



Area in 8-year Floodplain: 421.5 acres

Area of DU: 20.1 acres

LAND USE VERIFIED

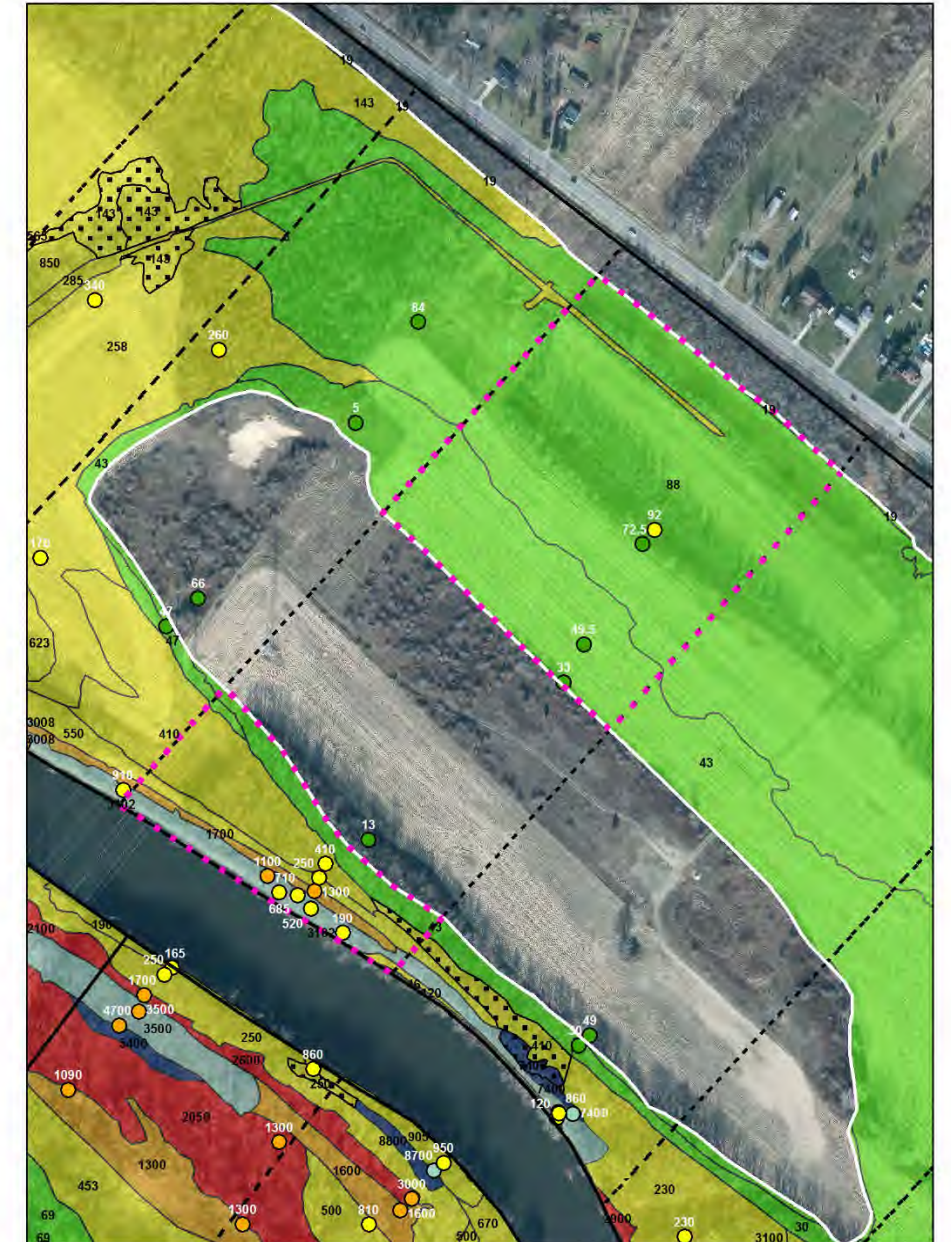
Aerial Background



Geomorphic Polygons



SAC Polygons and Existing Samples



Area in 8-year Floodplain: 421.5 acres

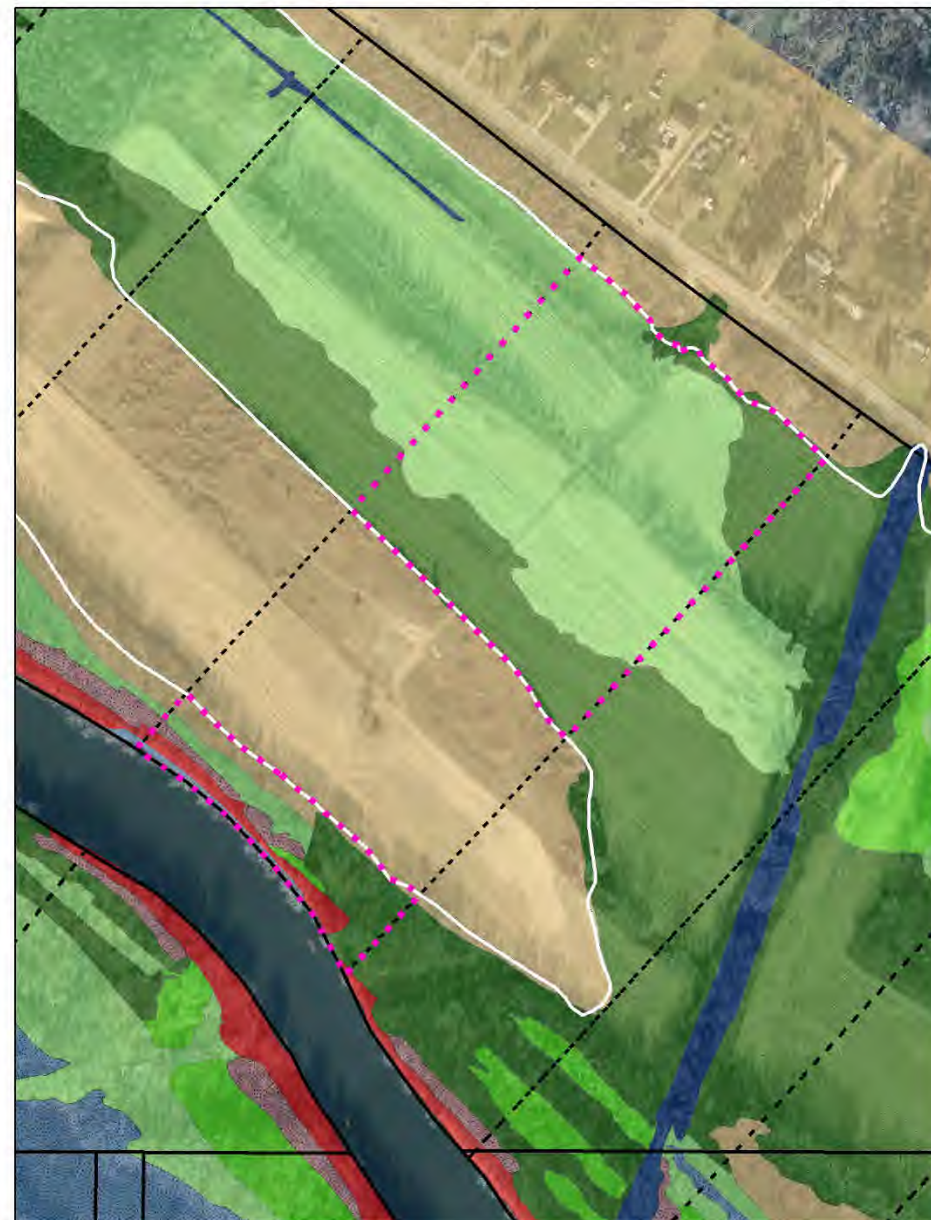
Area of DU: 20.0 acres

LAND USE VERIFIED

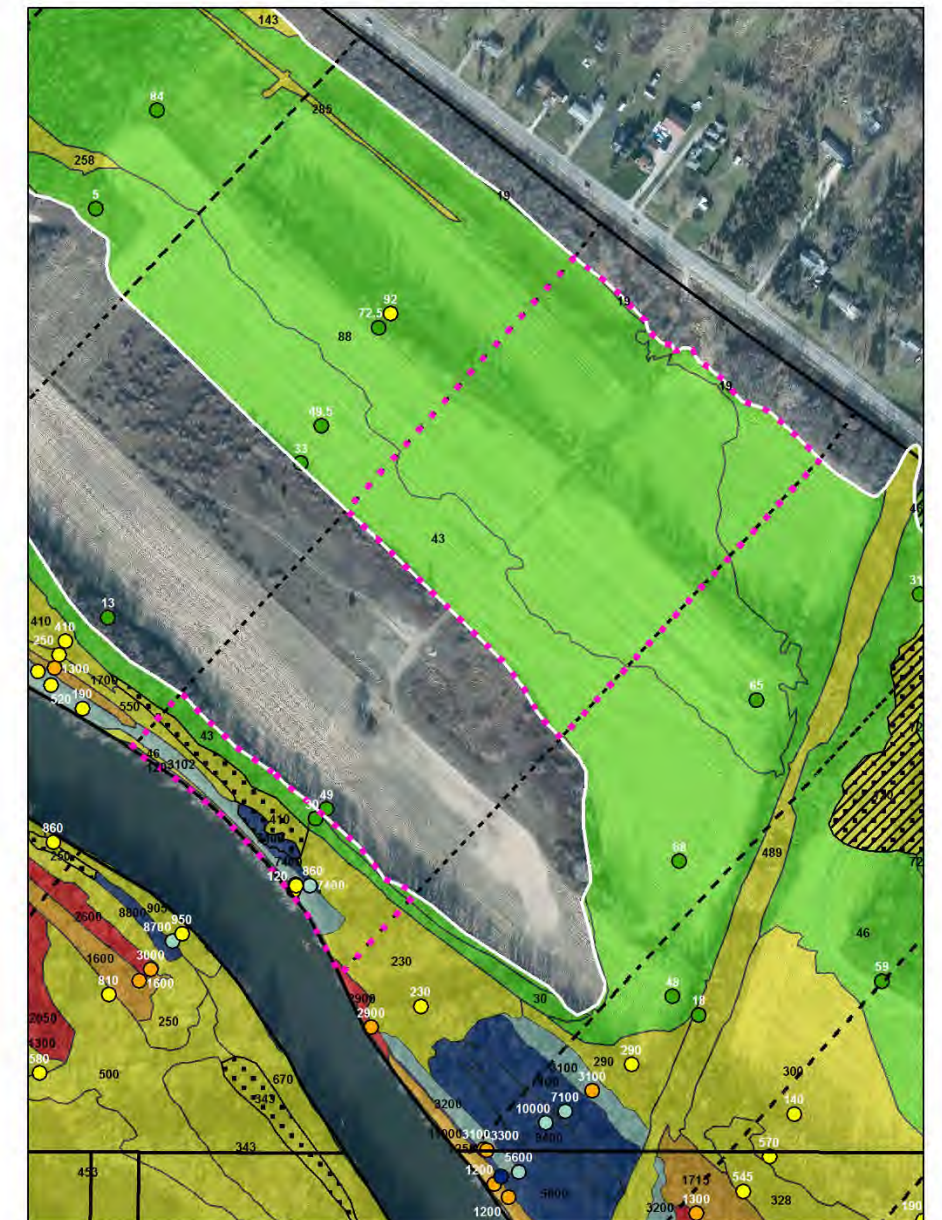
Aerial Background



Geomorphic Polygons



SAC Polygons and Existing Samples

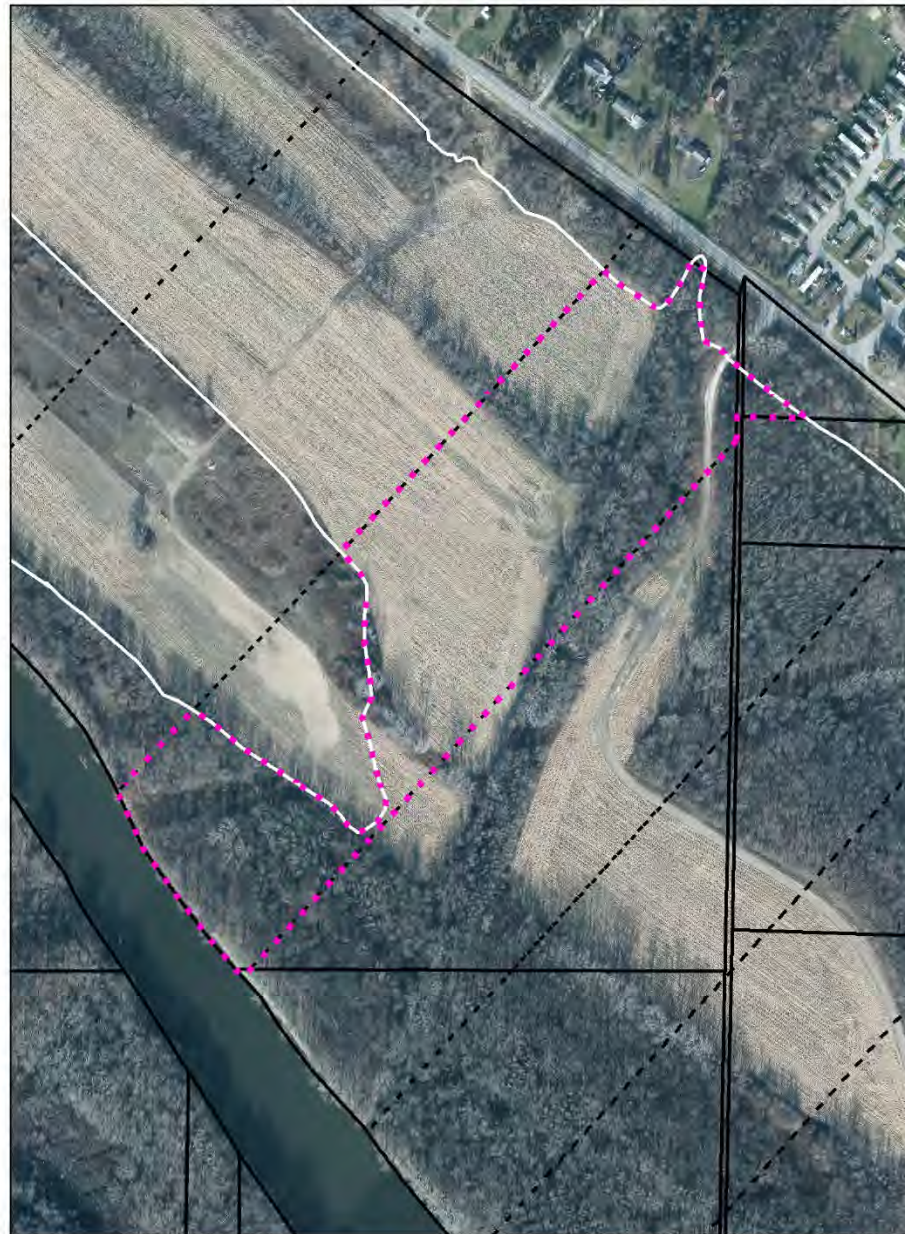


Area in 8-year Floodplain: 421.5 acres

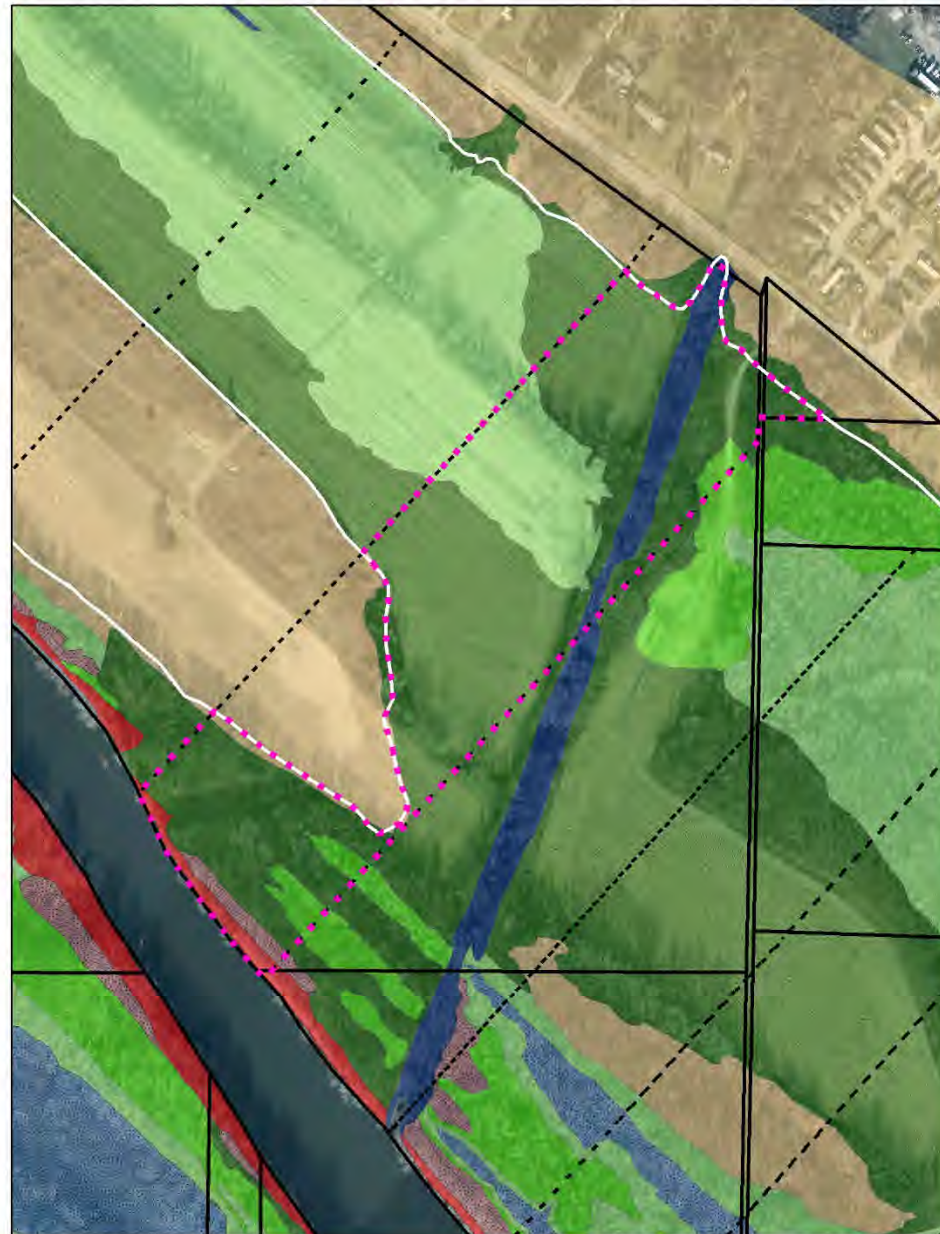
Area of DU: 20.1 acres

LAND USE VERIFIED

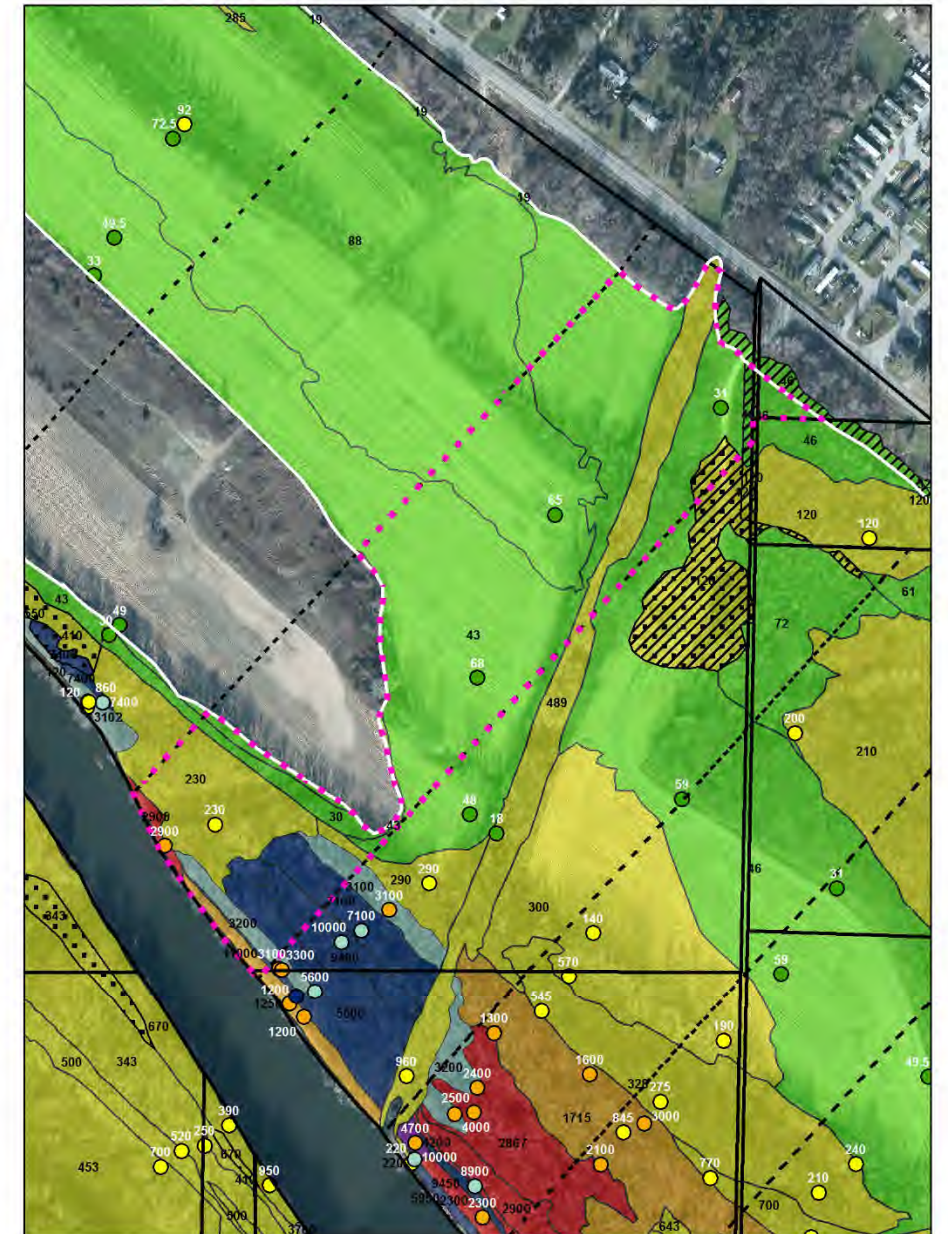
Aerial Background



Geomorphic Polygons



SAC Polygons and Existing Samples



Area in 8-year Floodplain: 421.5 acres

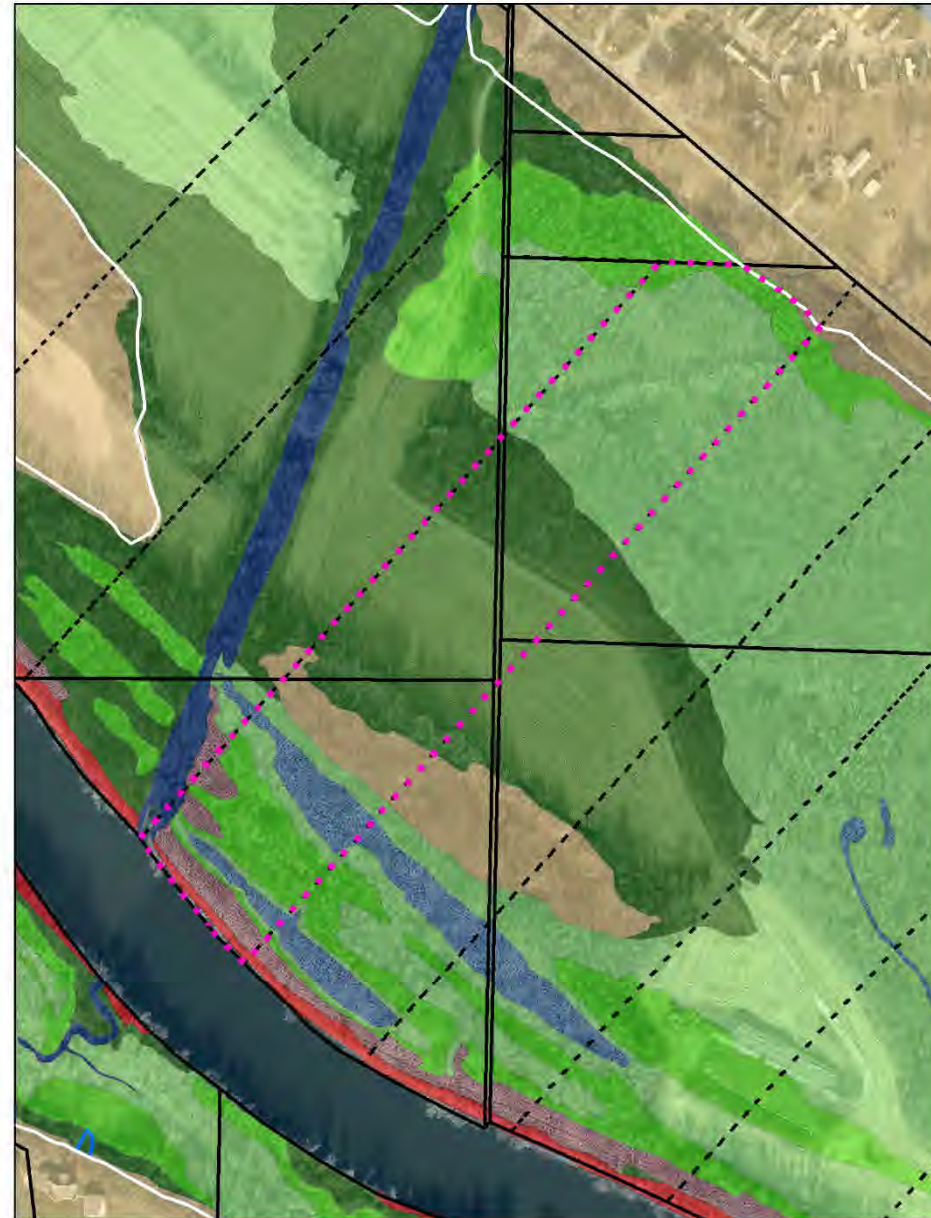
Area of DU: 20.1 acres

LAND USE VERIFIED

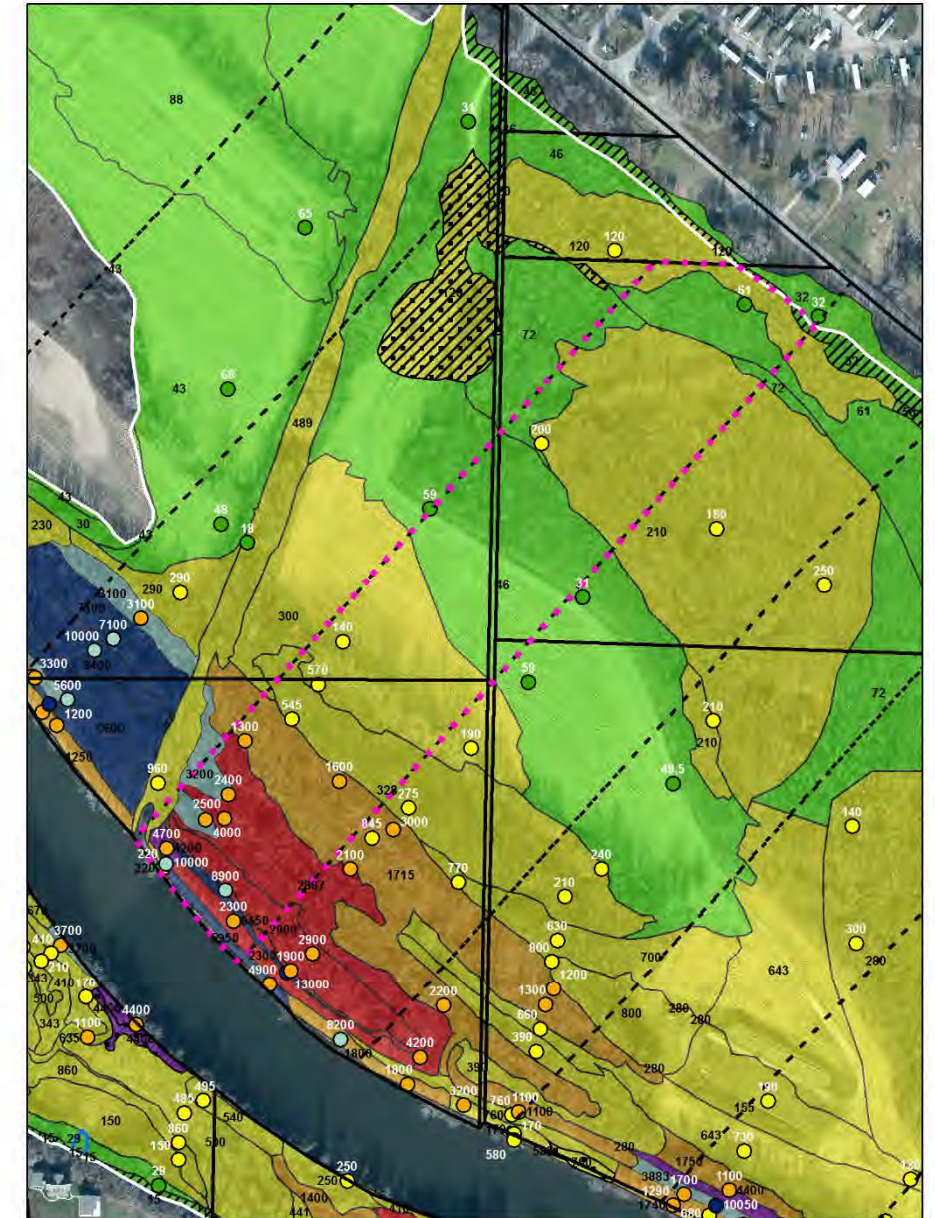
Aerial Background



Geomorphic Polygons



SAC Polygons and Existing Samples



Area in 8-year Floodplain: 421.5 acres

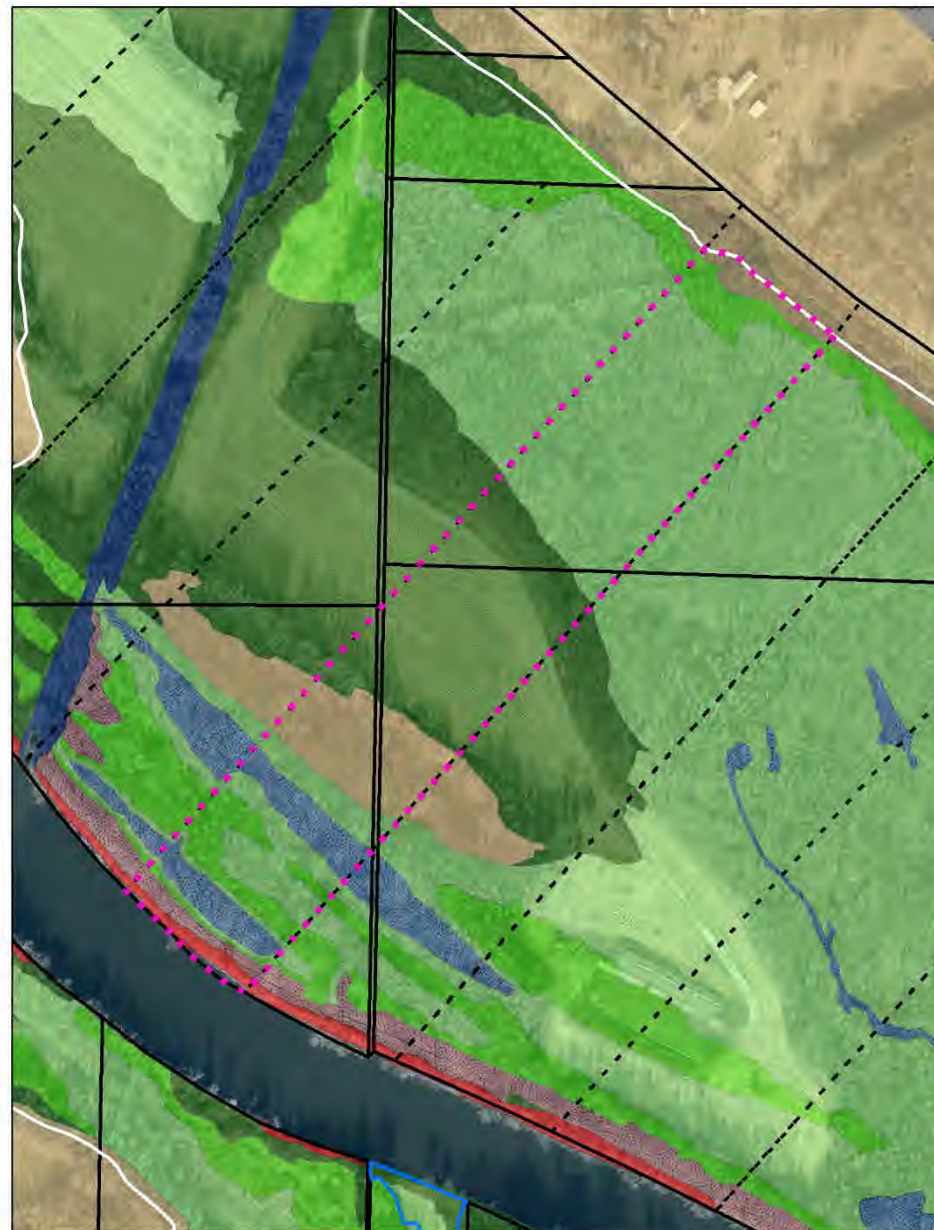
Area of DU: 20.1 acres

LAND USE VERIFIED

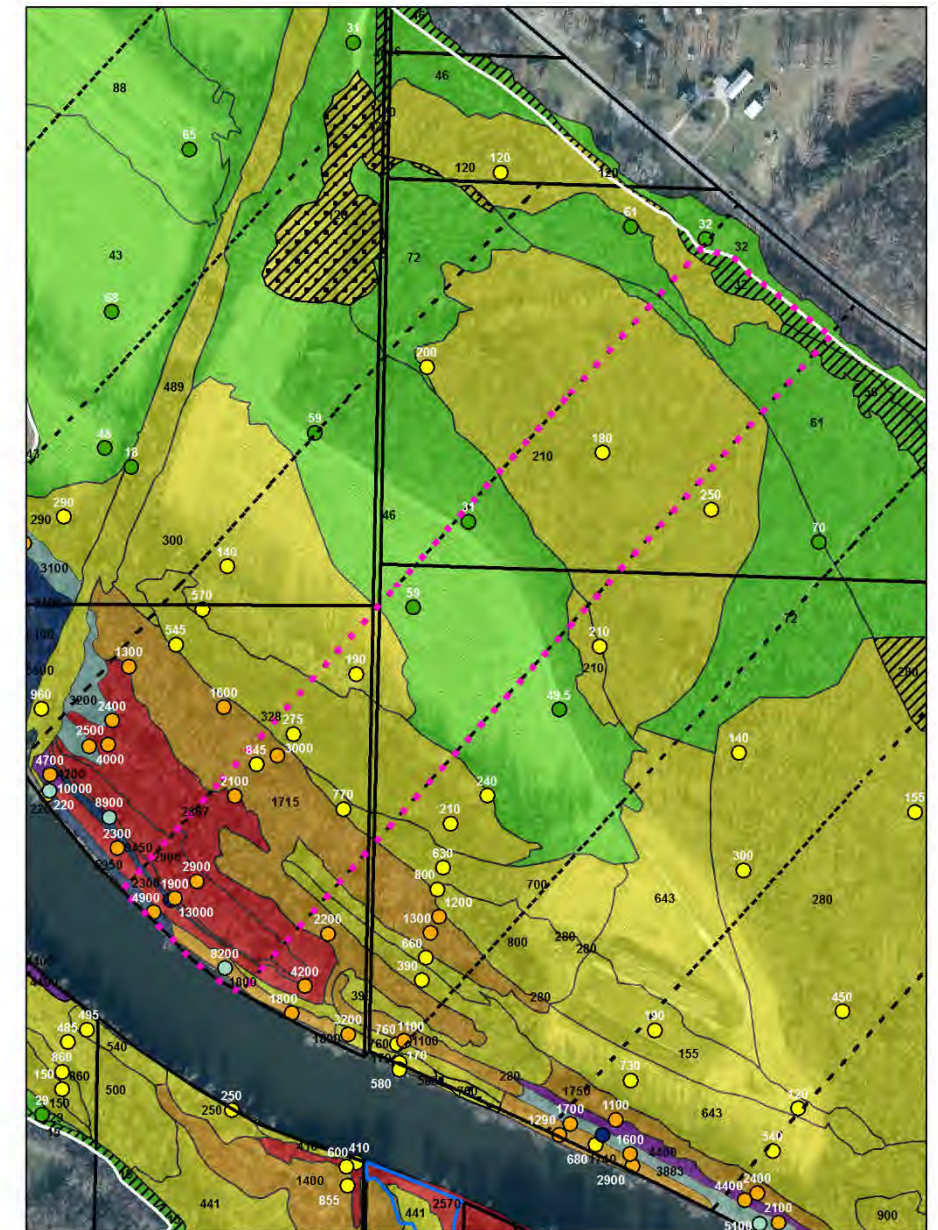
Aerial Background



Geomorphic Polygons



SAC Polygons and Existing Samples



S2_10-13_DU11
Tittabawassee River Floodplain Post-Removal Site Control Plan

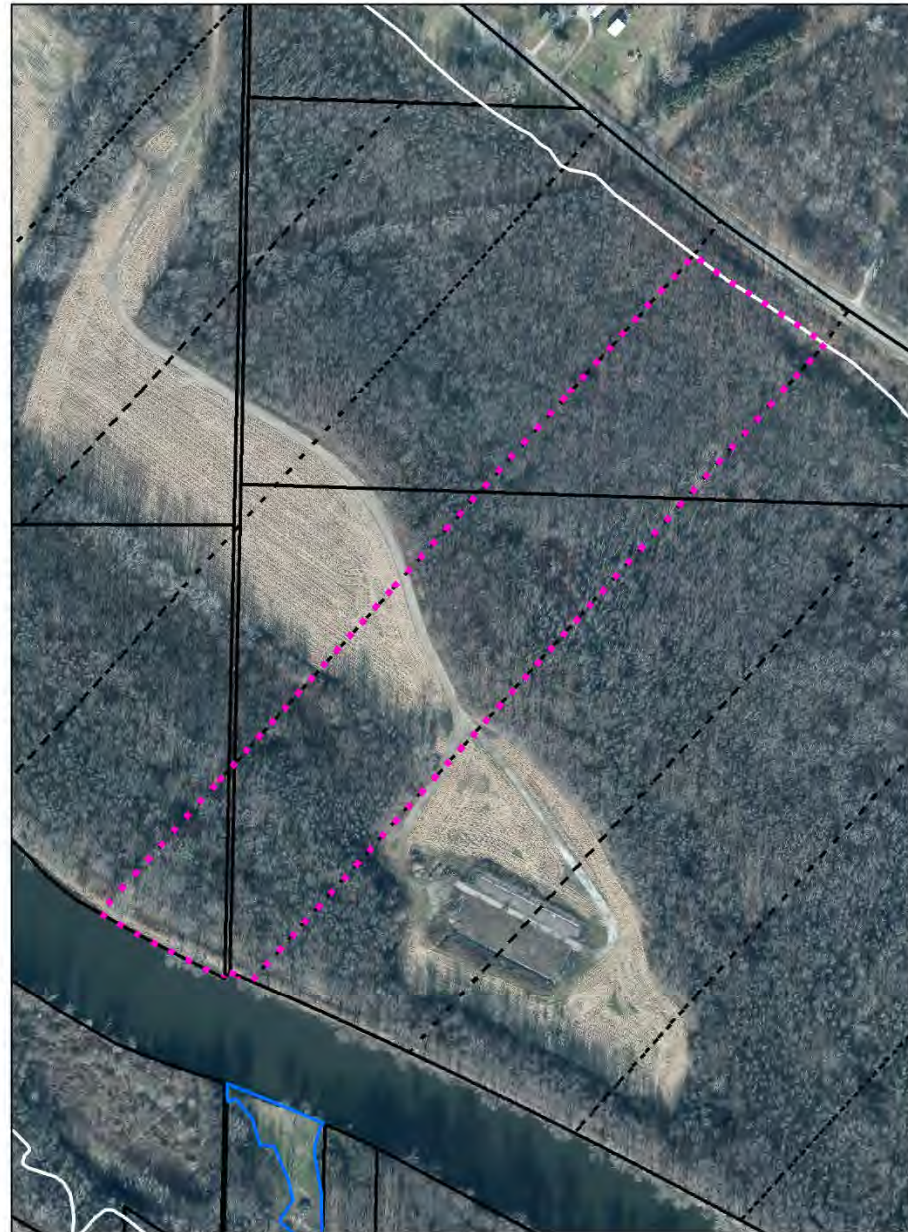
Figure
S2_10-13_11

Area in 8-year Floodplain: 421.5 acres

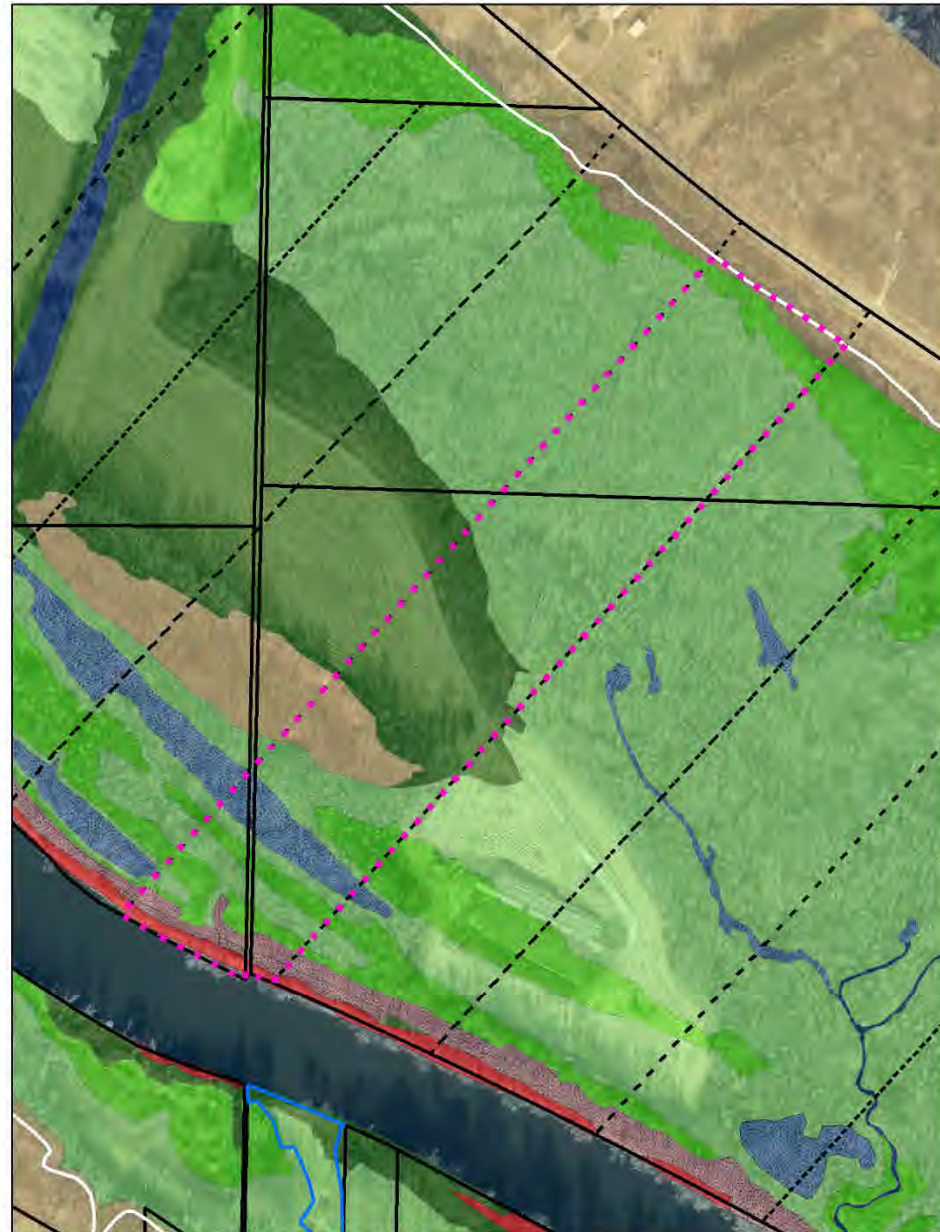
Area of DU: 20.1 acres

LAND USE VERIFIED

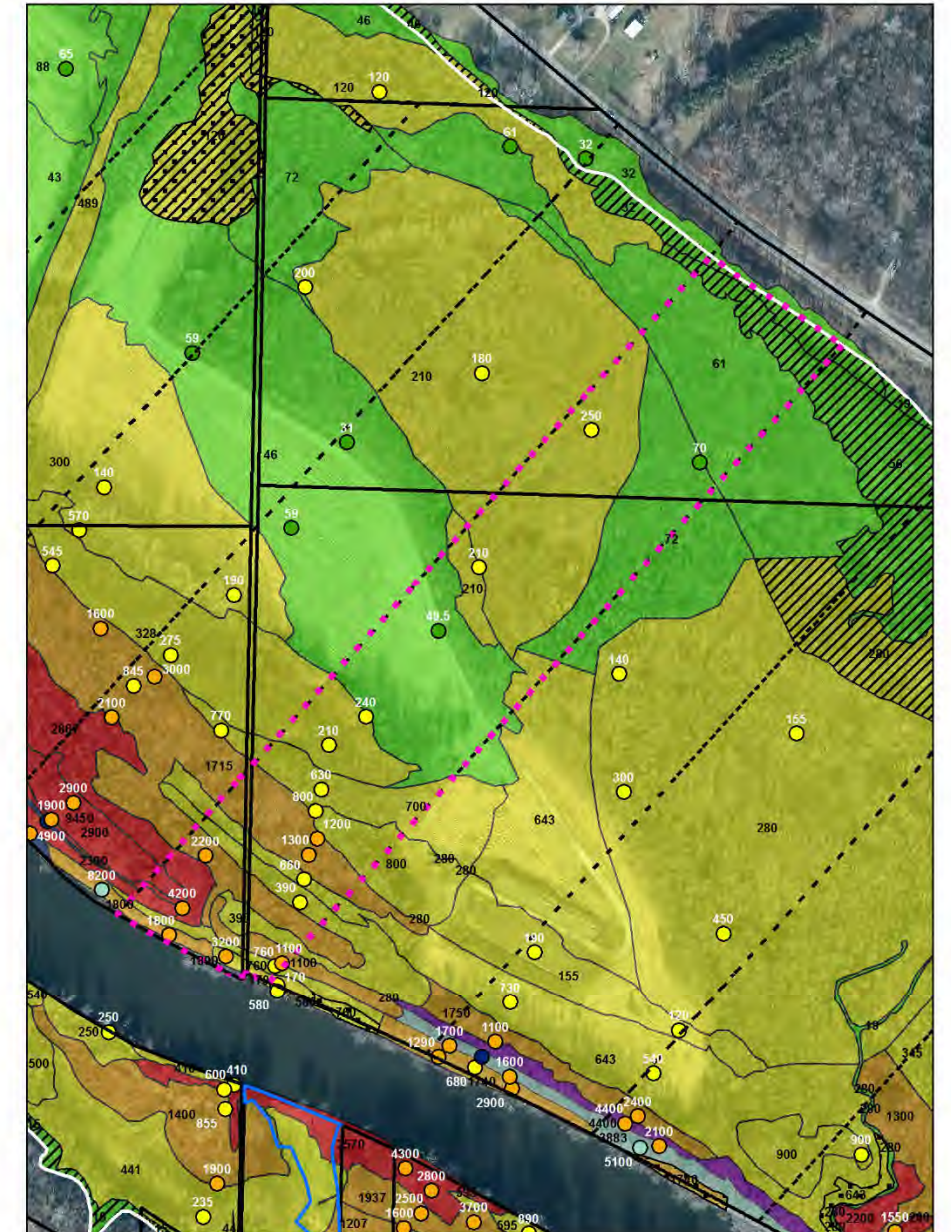
Aerial Background



Geomorphic Polygons



SAC Polygons and Existing Samples



Area in 8-year Floodplain: 421.5 acres

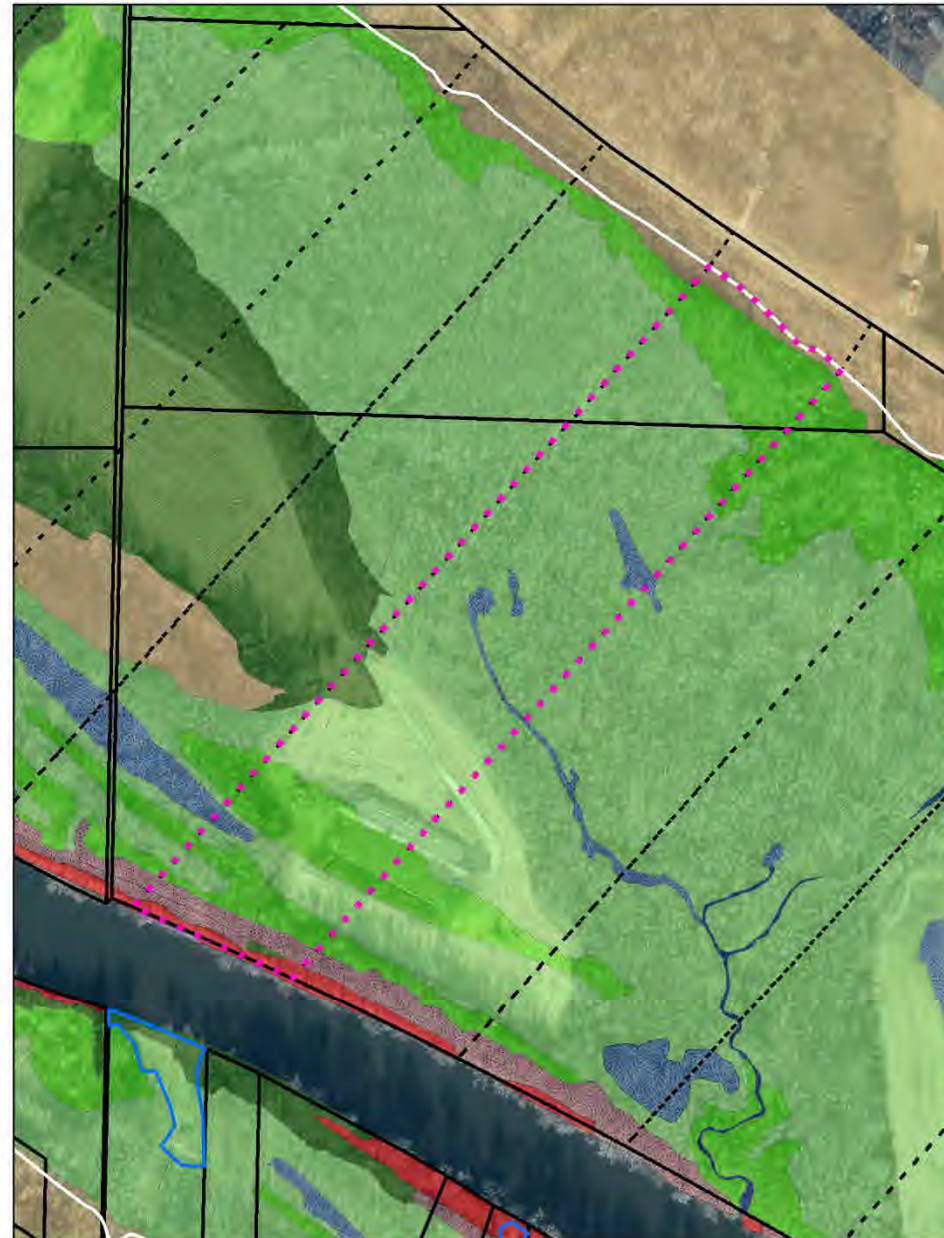
Area of DU: 20.1 acres

LAND USE VERIFIED

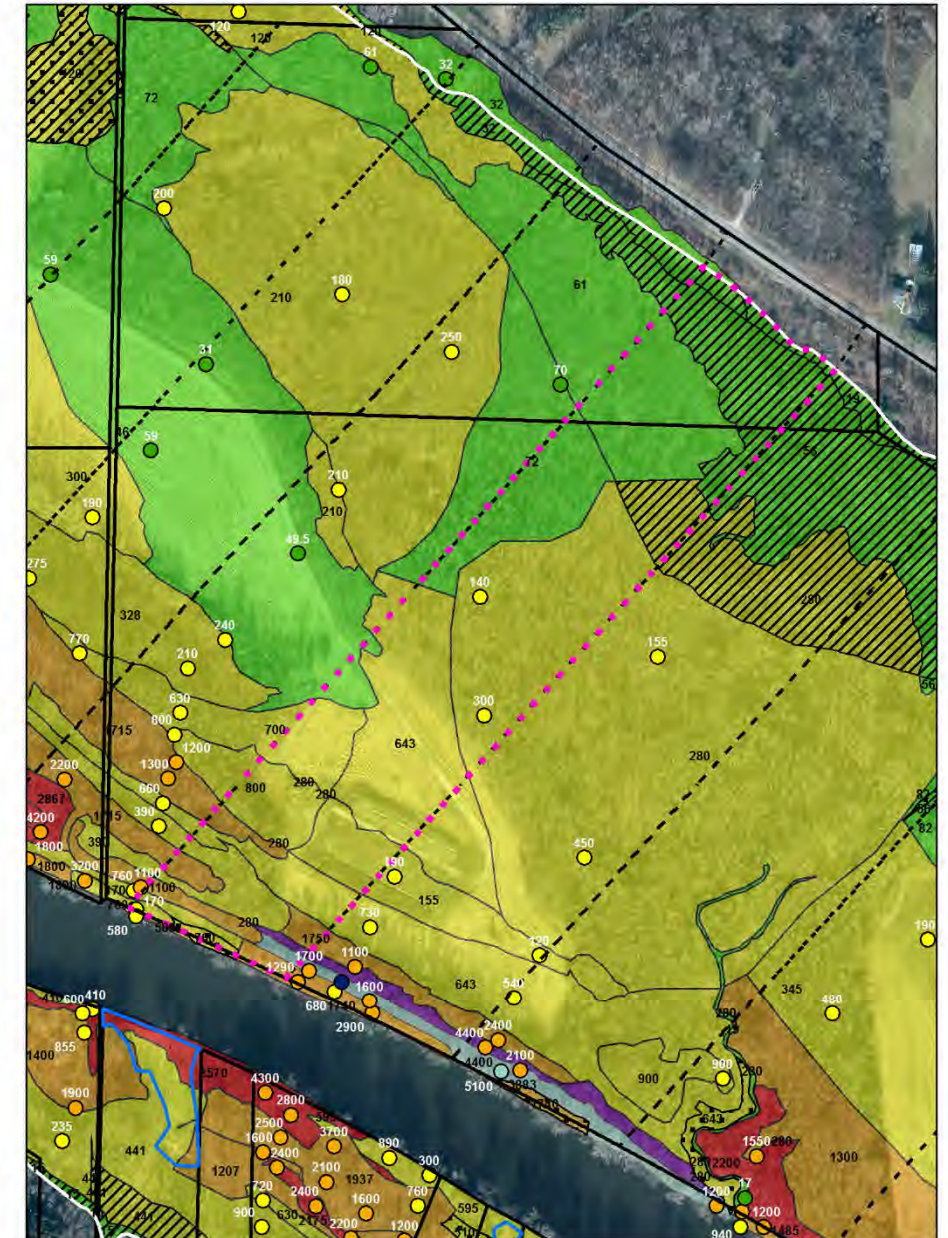
Aerial Background



Geomorphic Polygons



SAC Polygons and Existing Samples



Area in 8-year Floodplain: 421.5 acres

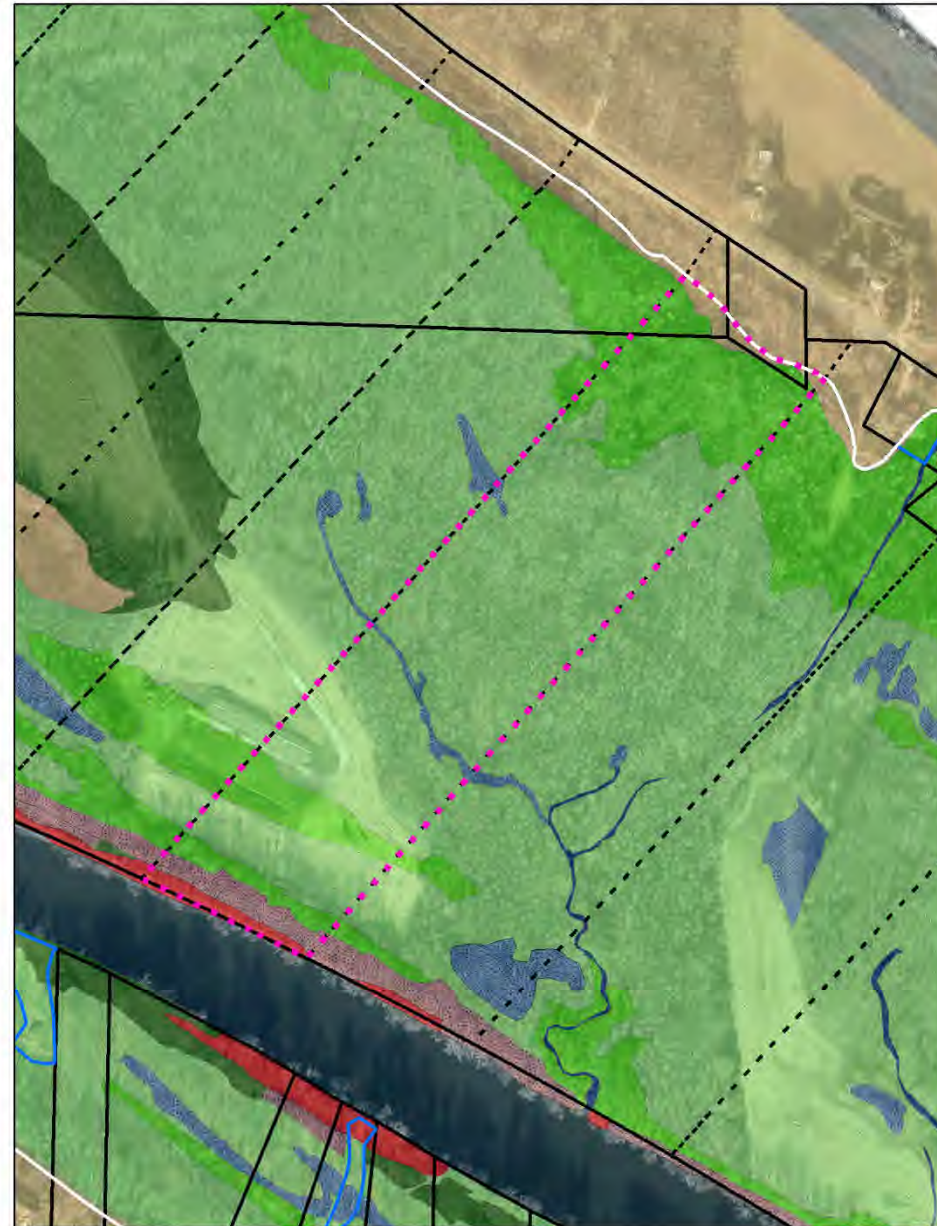
Area of DU: 20.1 acres

LAND USE VERIFIED

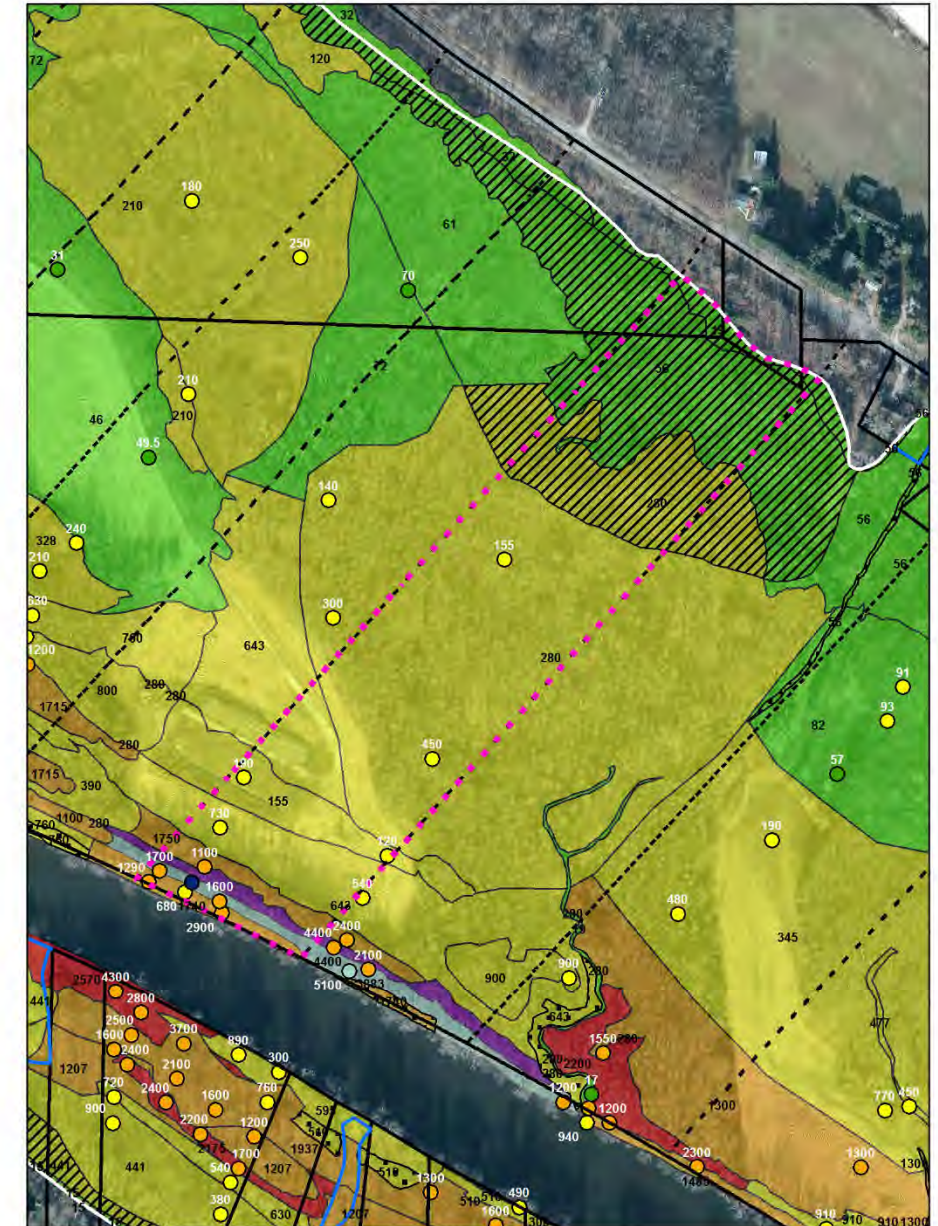
Aerial Background



Geomorphic Polygons



SAC Polygons and Existing Samples

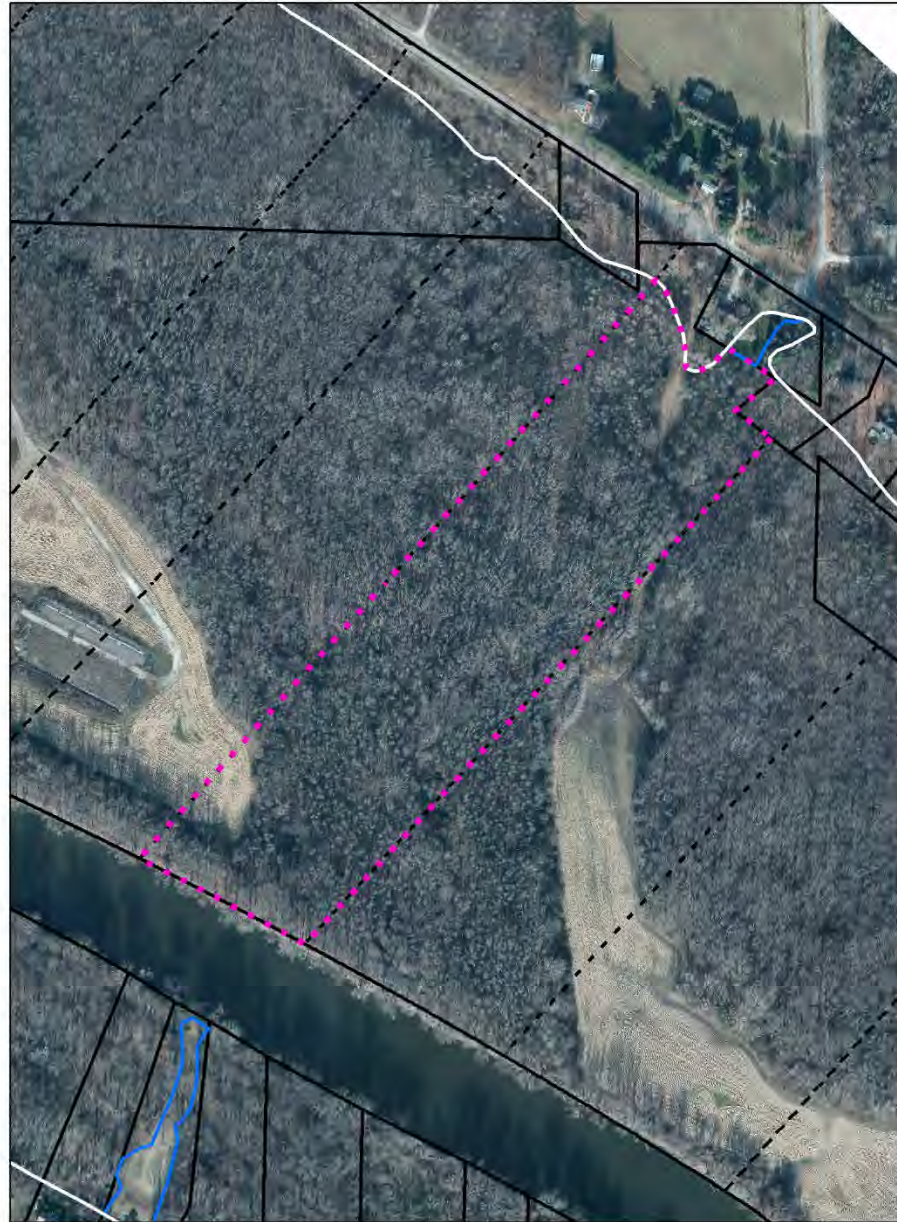


Area in 8-year Floodplain: 421.5 acres

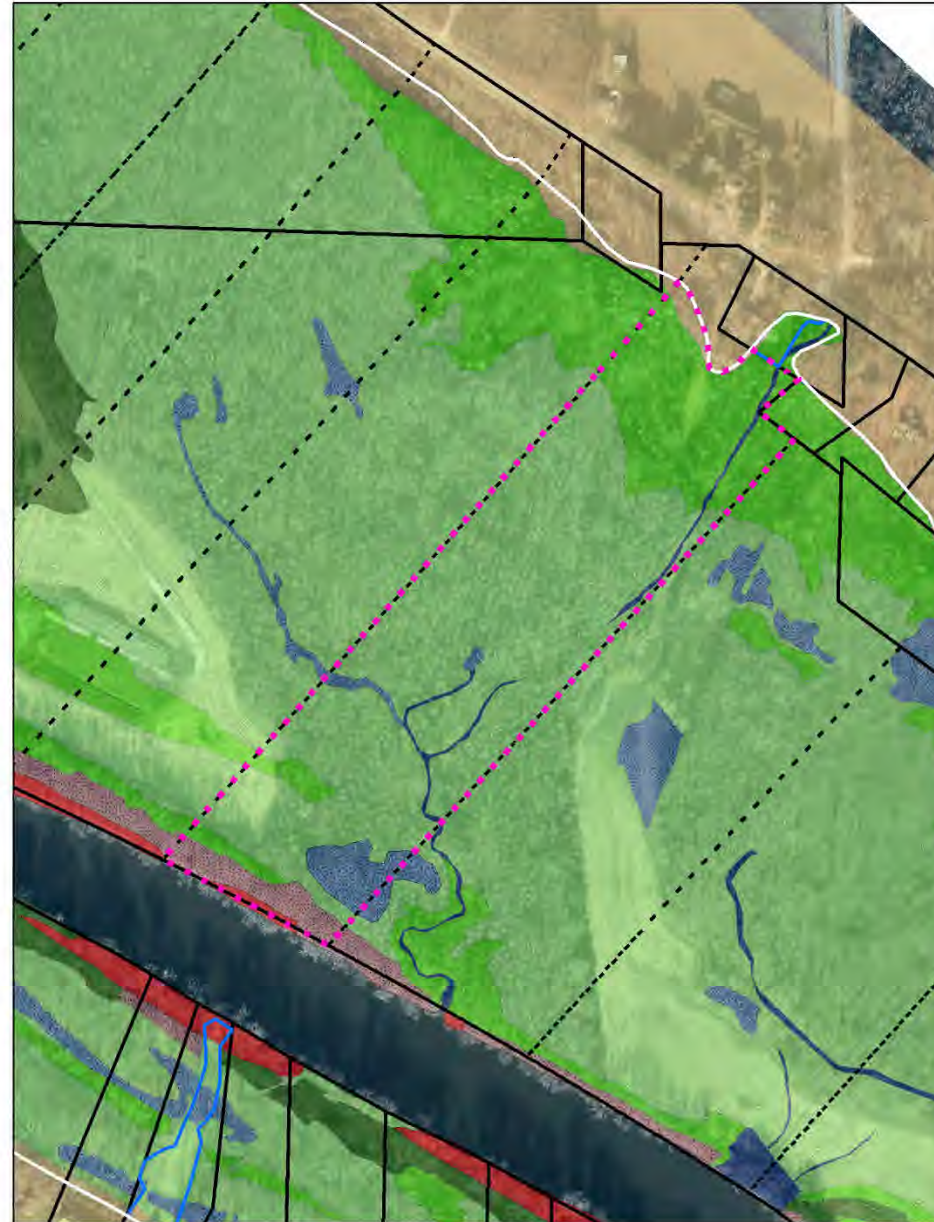
Area of DU: 20.1 acres

LAND USE VERIFIED

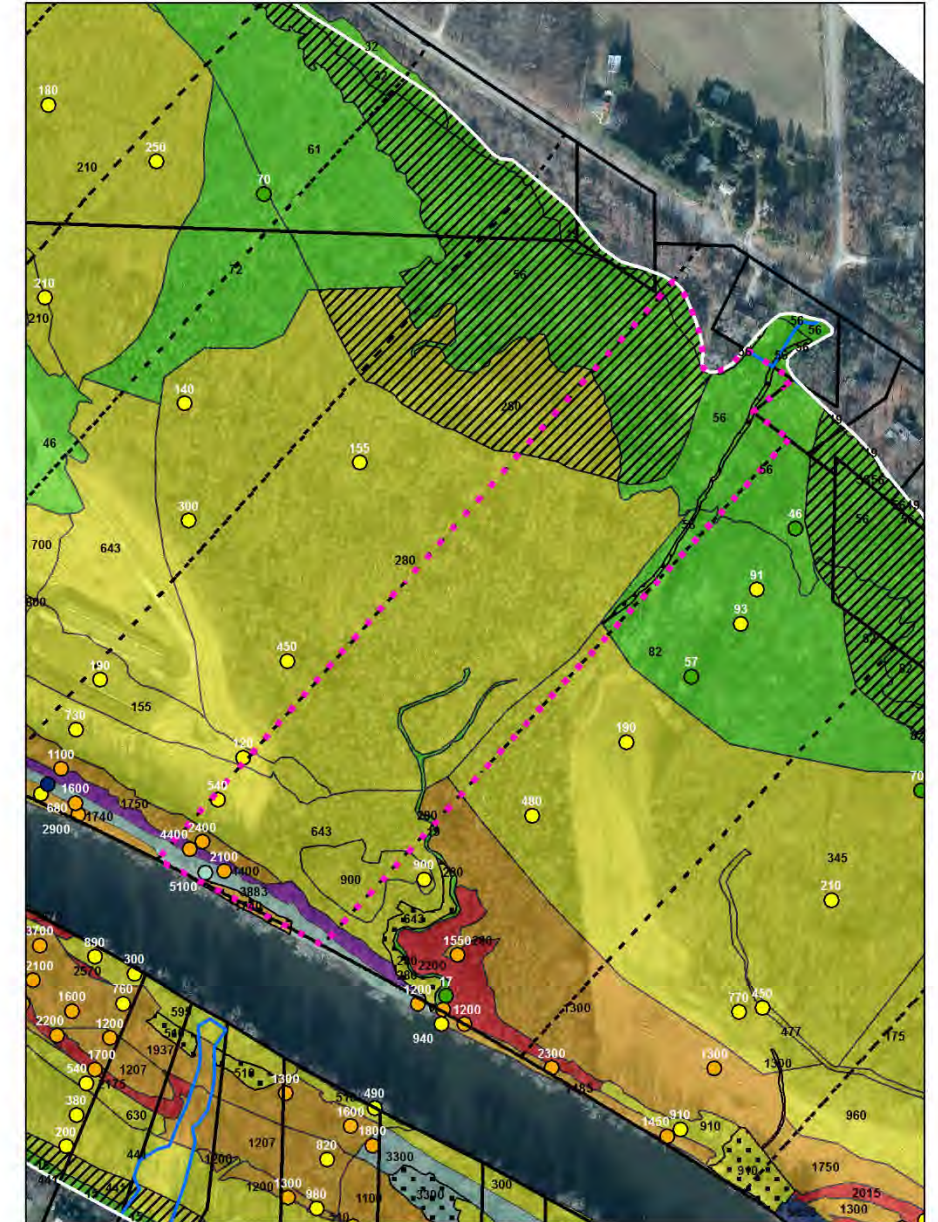
Aerial Background



Geomorphic Polygons



SAC Polygons and Existing Samples

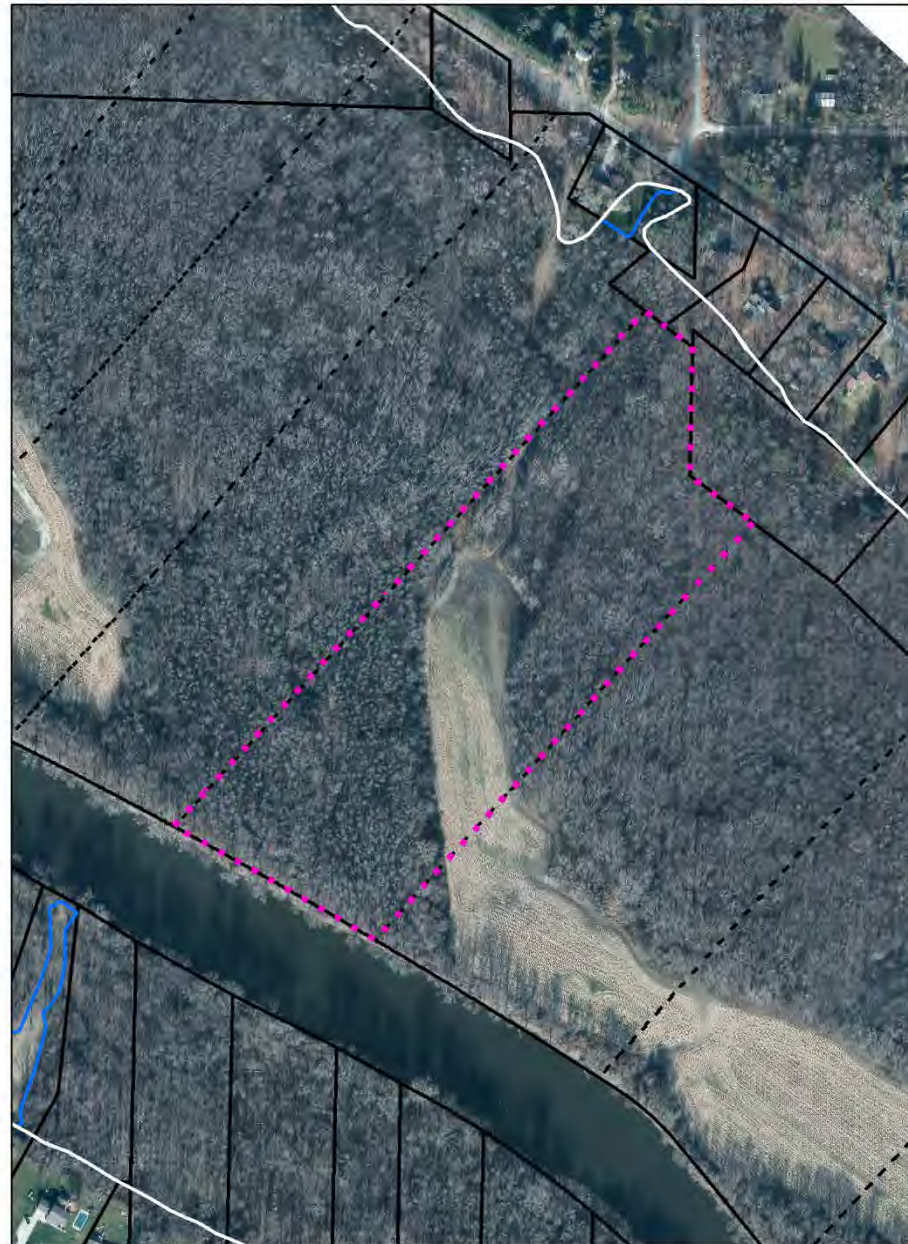


Area in 8-year Floodplain: 421.5 acres

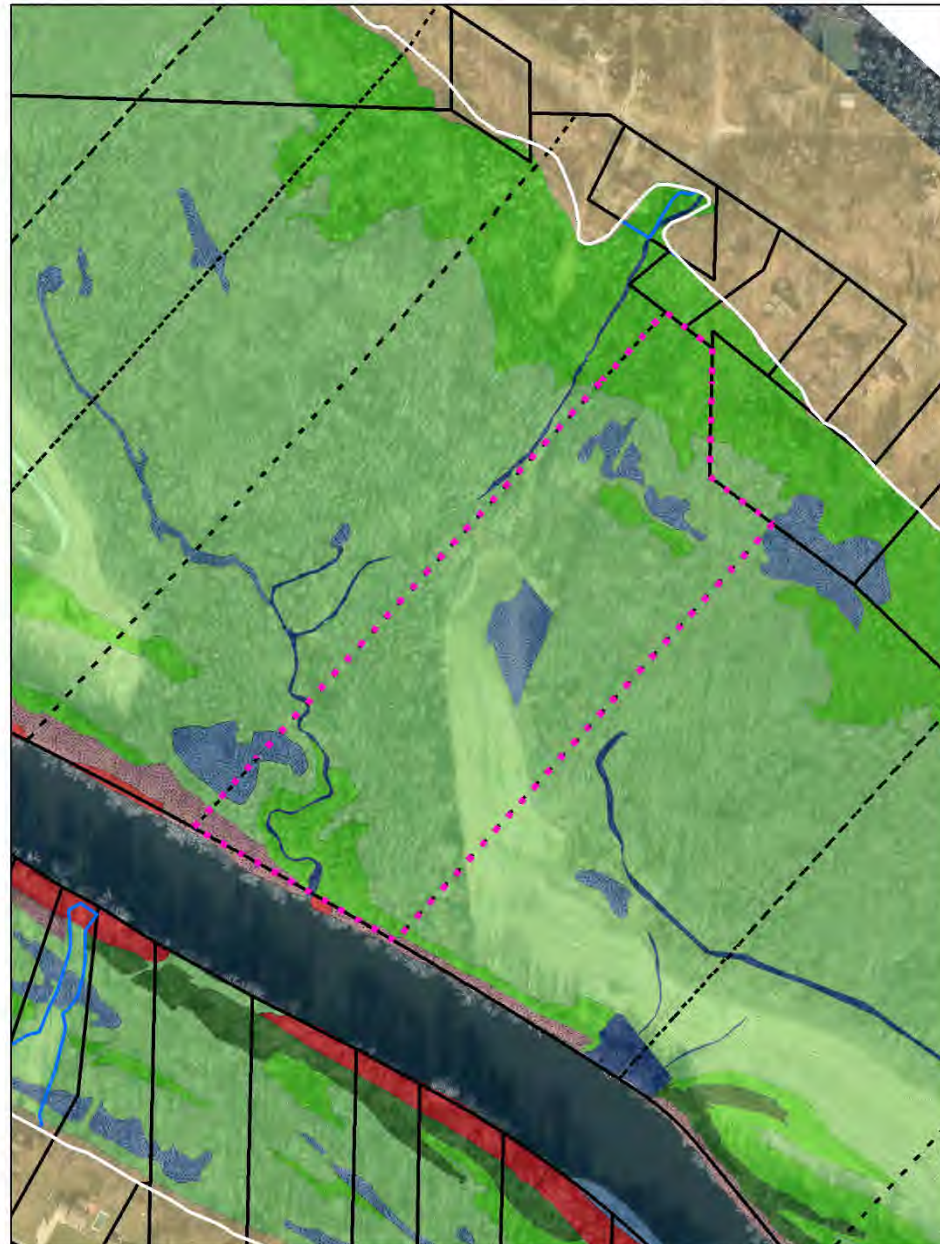
Area of DU: 20.1 acres

LAND USE VERIFIED

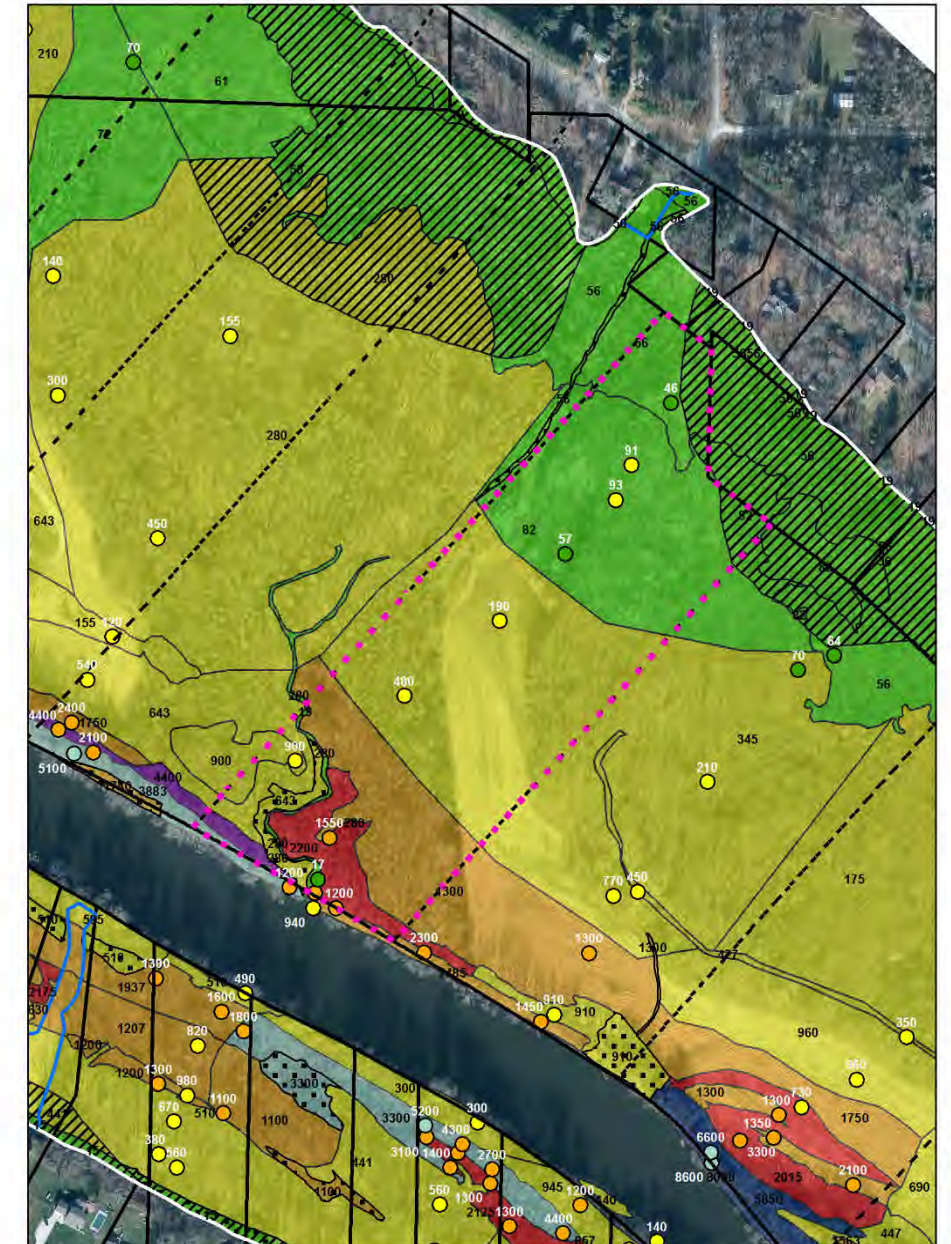
Aerial Background



Geomorphic Polygons



SAC Polygons and Existing Samples



Area in 8-year Floodplain: 421.5 acres

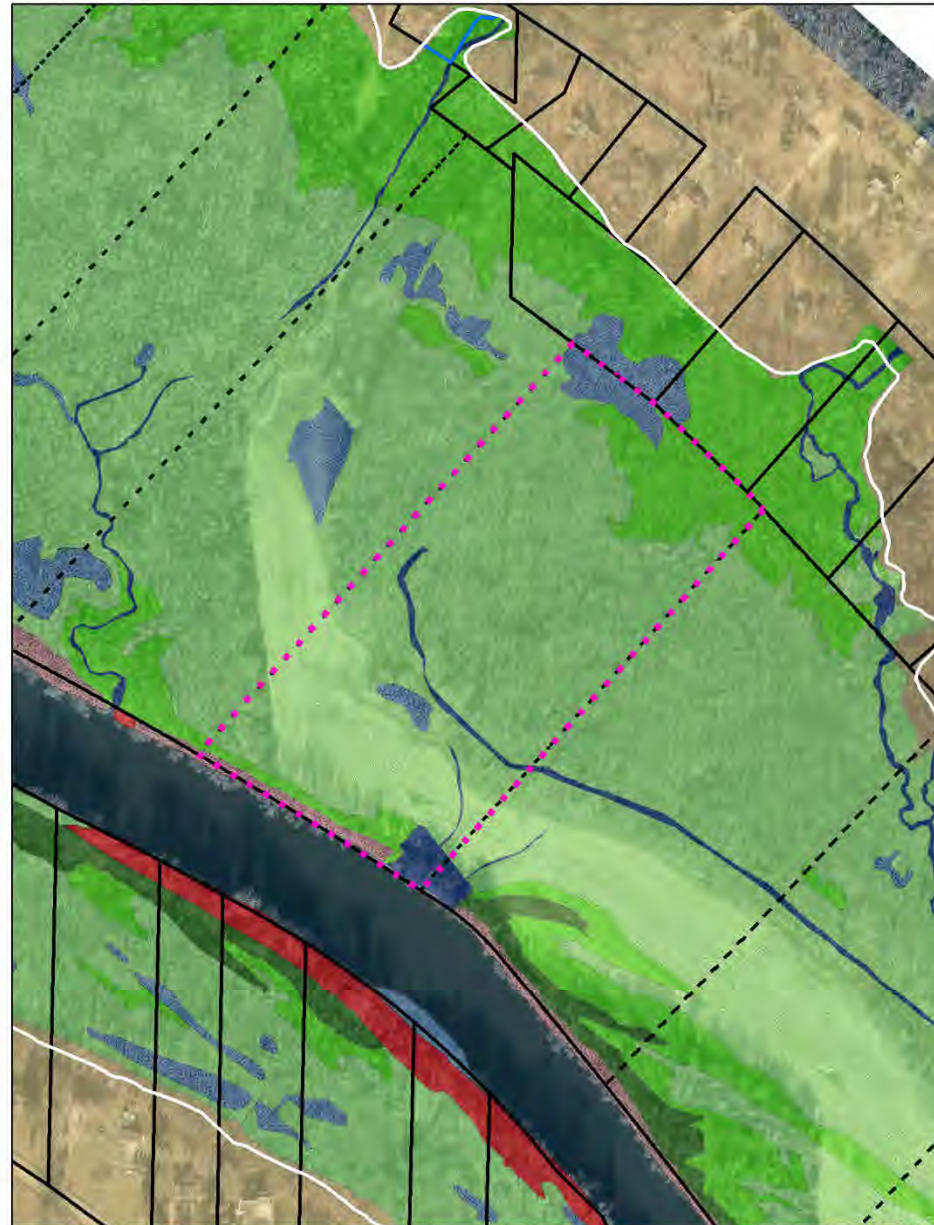
Area of DU: 20.1 acres

LAND USE VERIFIED

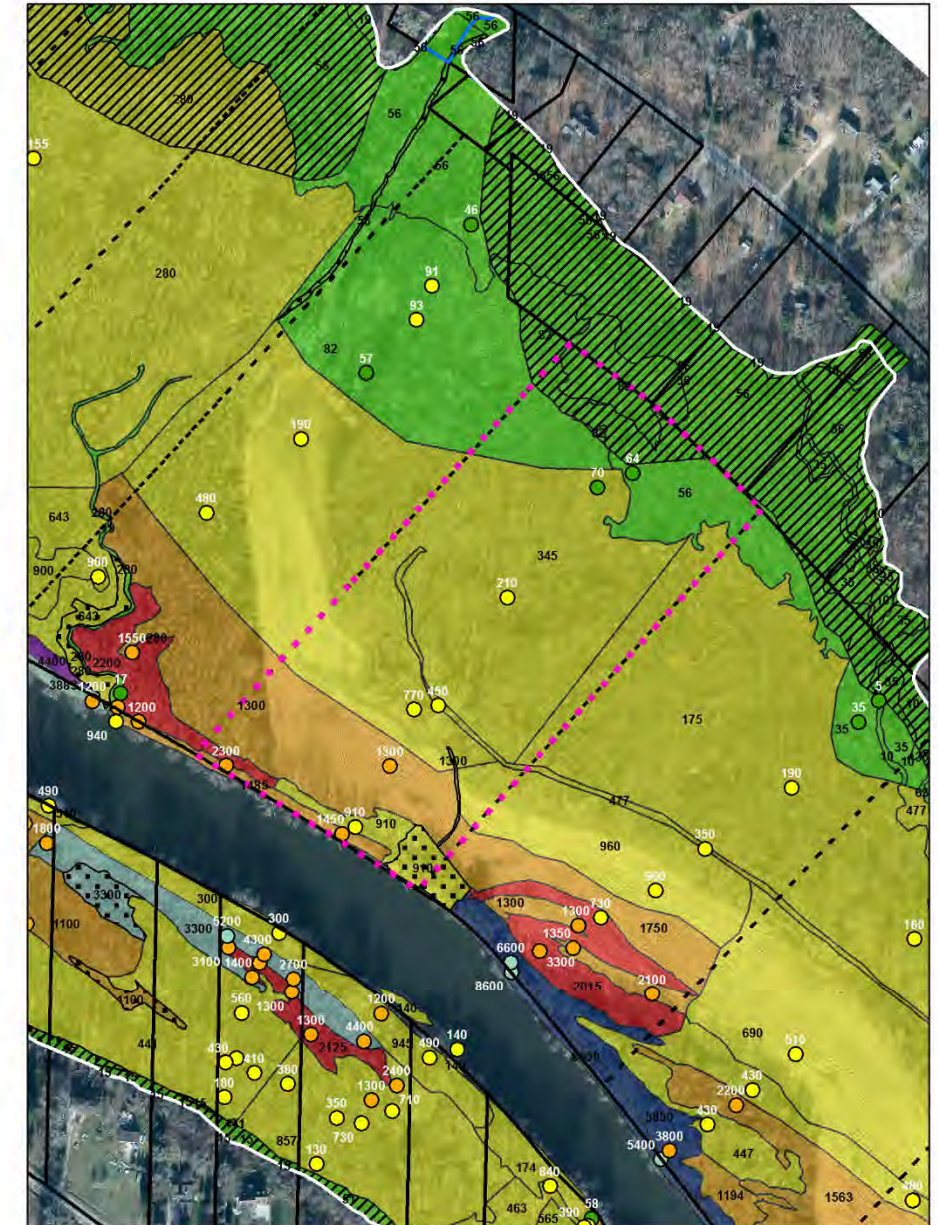
Aerial Background



Geomorphic Polygons



SAC Polygons and Existing Samples

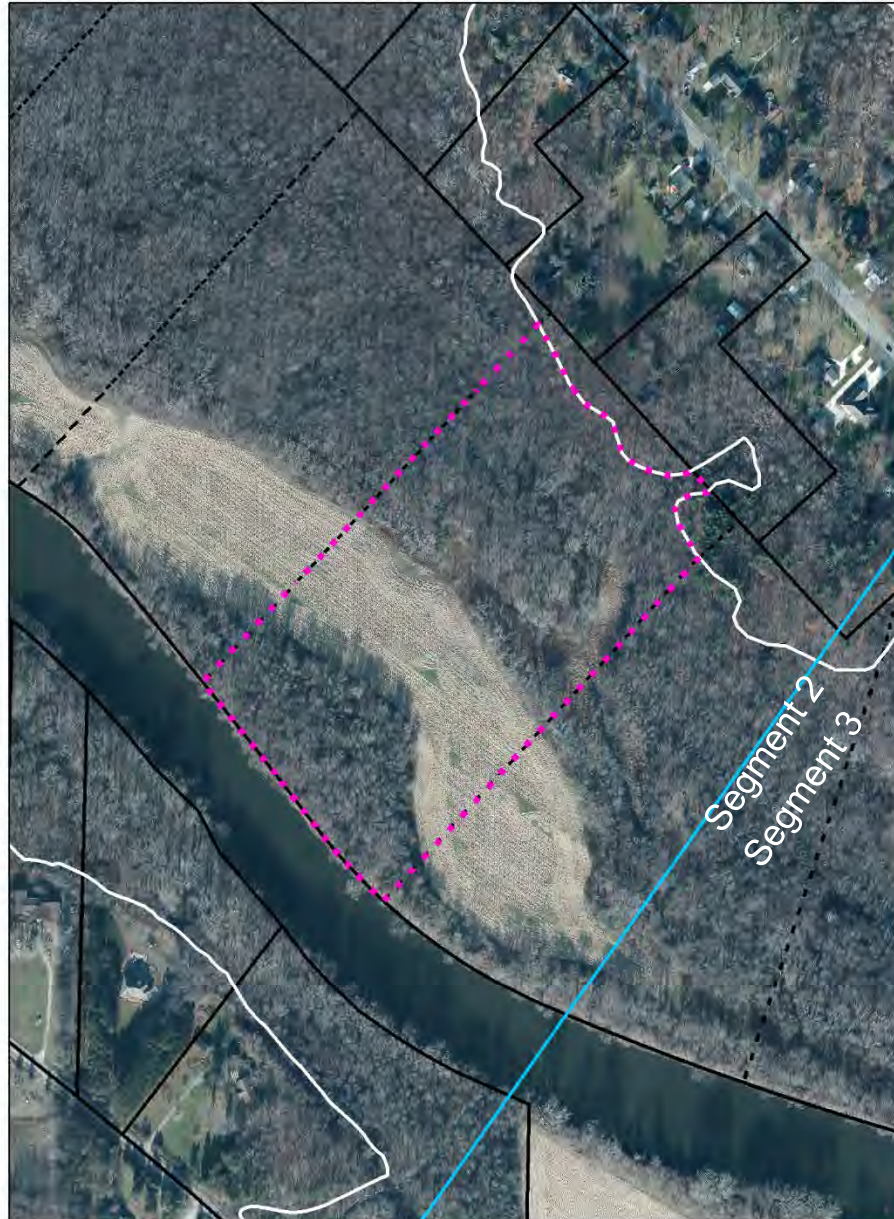


Area in 8-year Floodplain: 421.5 acres

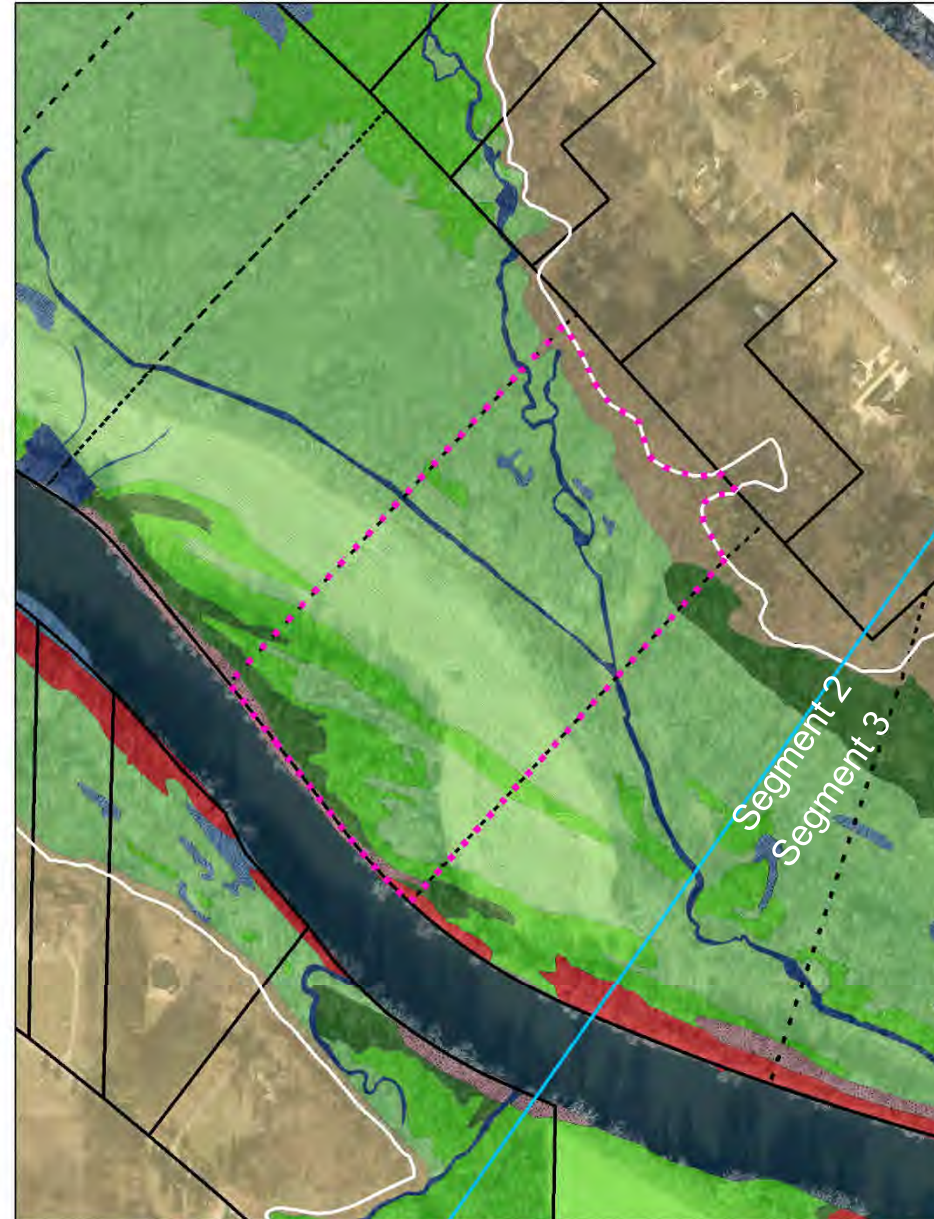
Area of DU: 20.0 acres

LAND USE VERIFIED

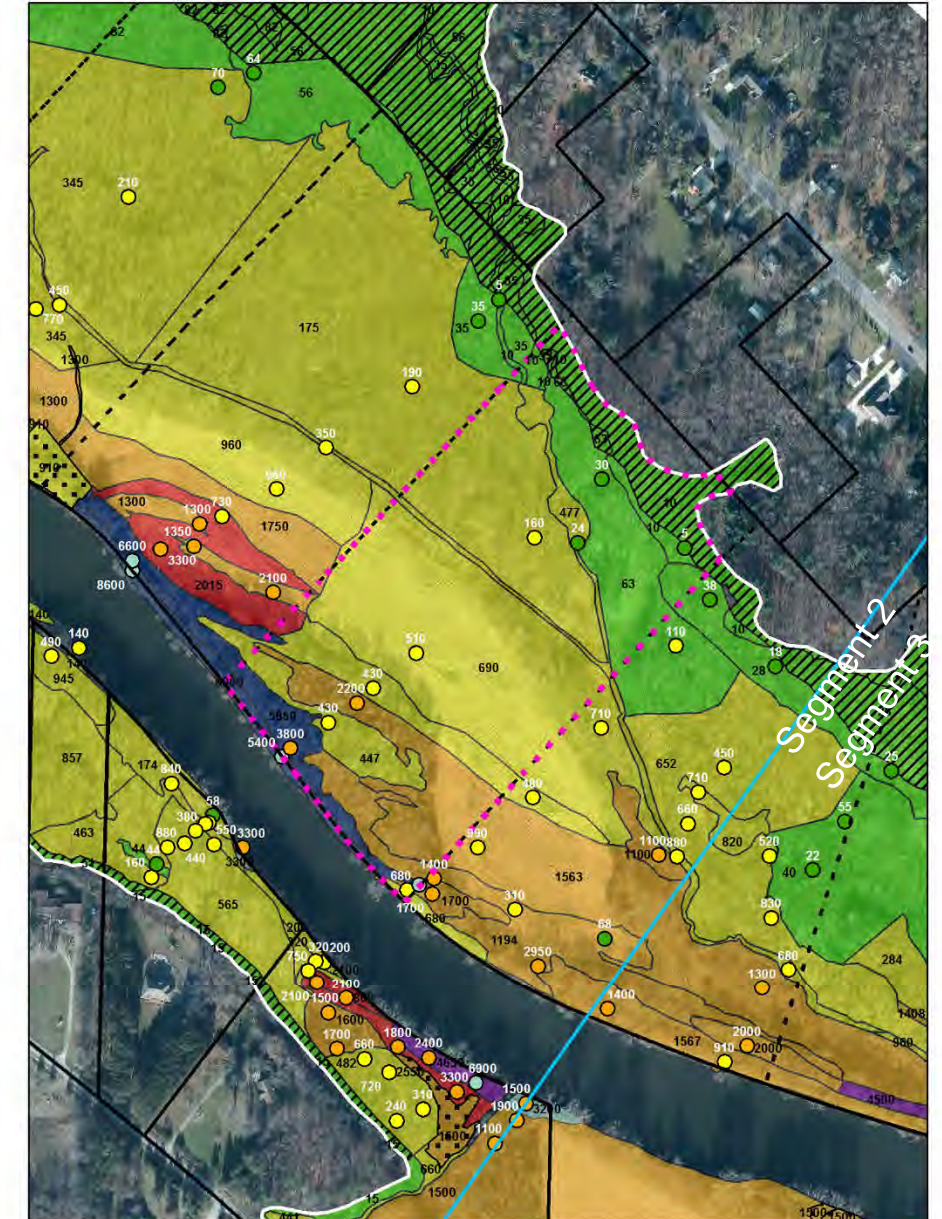
Aerial Background



Geomorphic Polygons



SAC Polygons and Existing Samples



Area in 8-year Floodplain: 421.5 acres

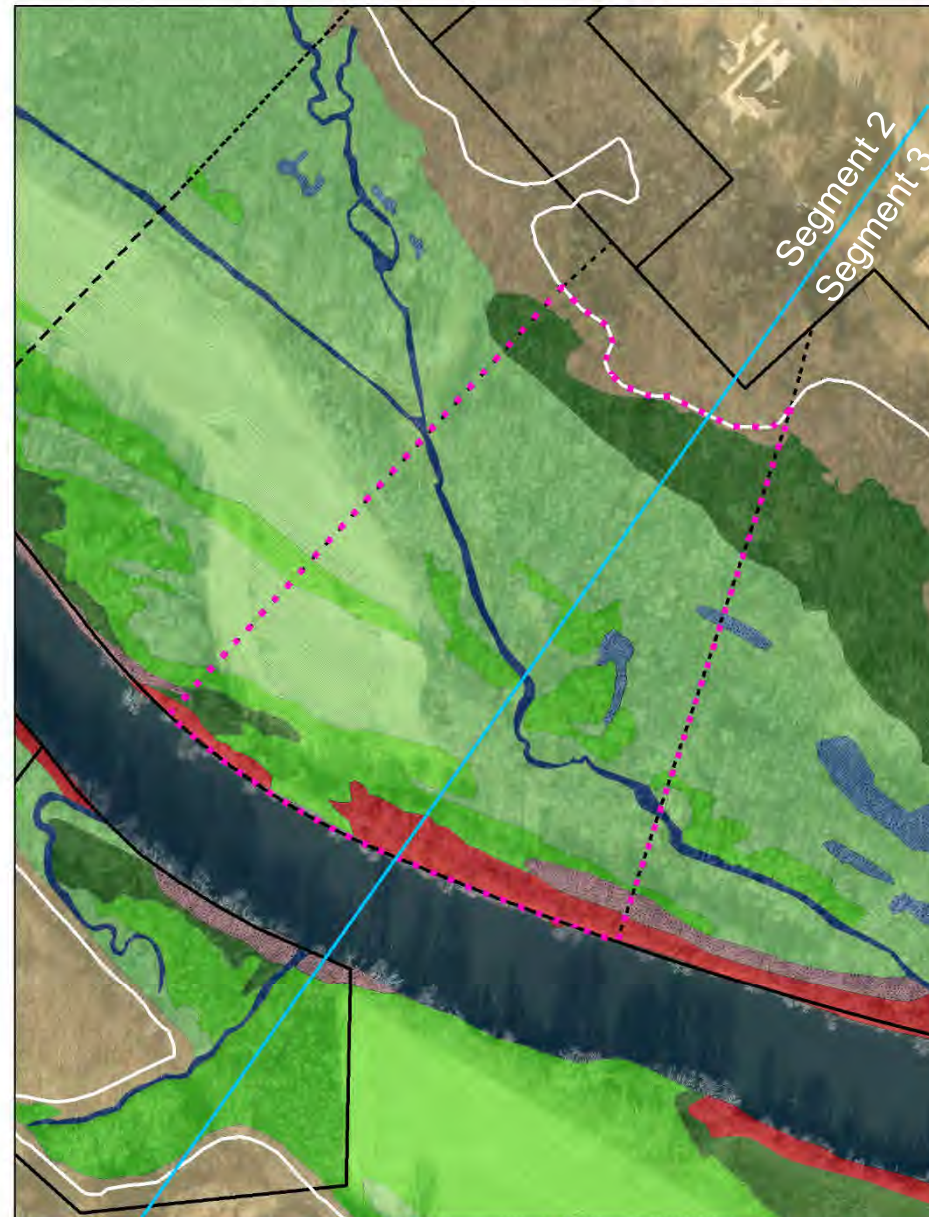
Area of DU: 20.2 acres

LAND USE VERIFIED

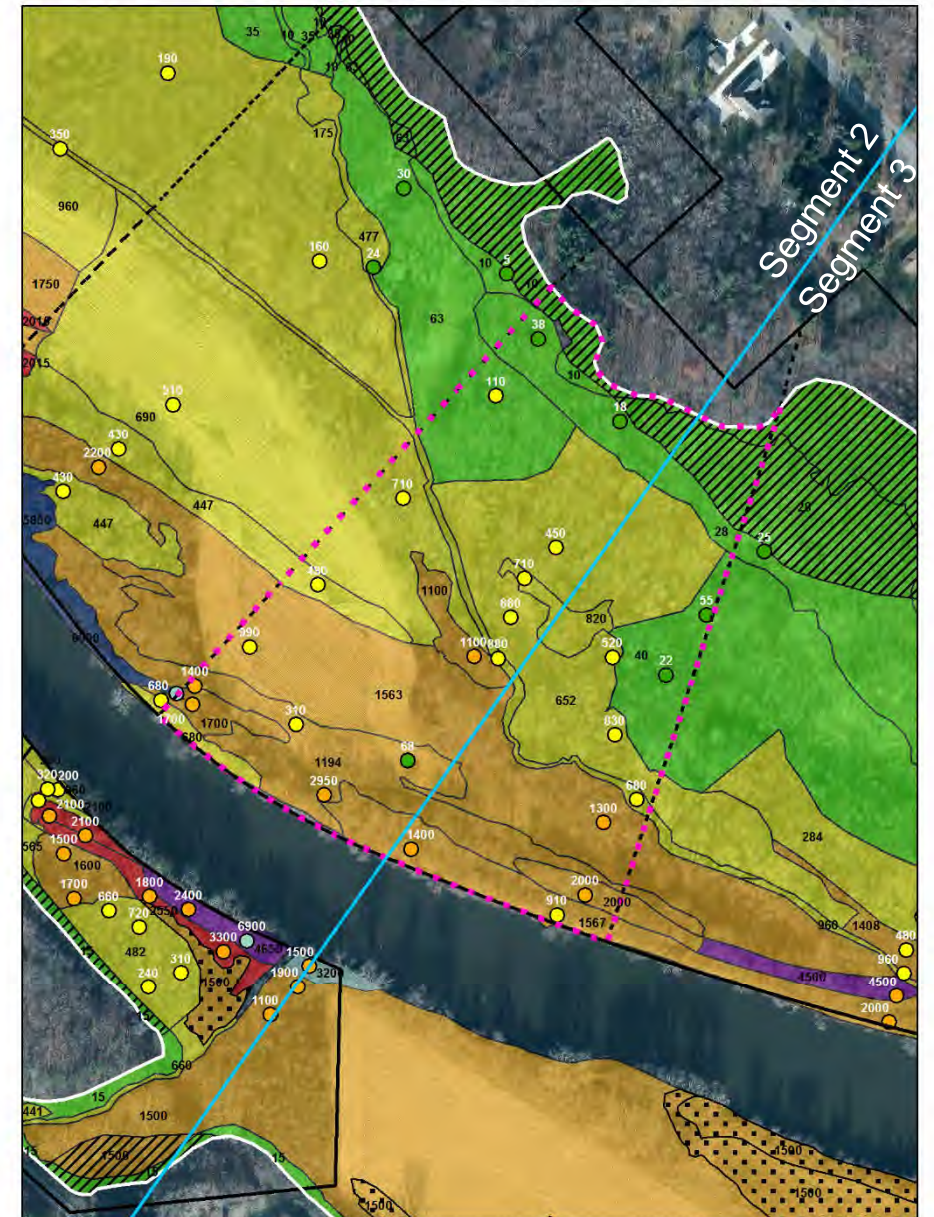
Aerial Background



Geomorphic Polygons



SAC Polygons and Existing Samples



Area in 8-year Floodplain: 421.5 acres

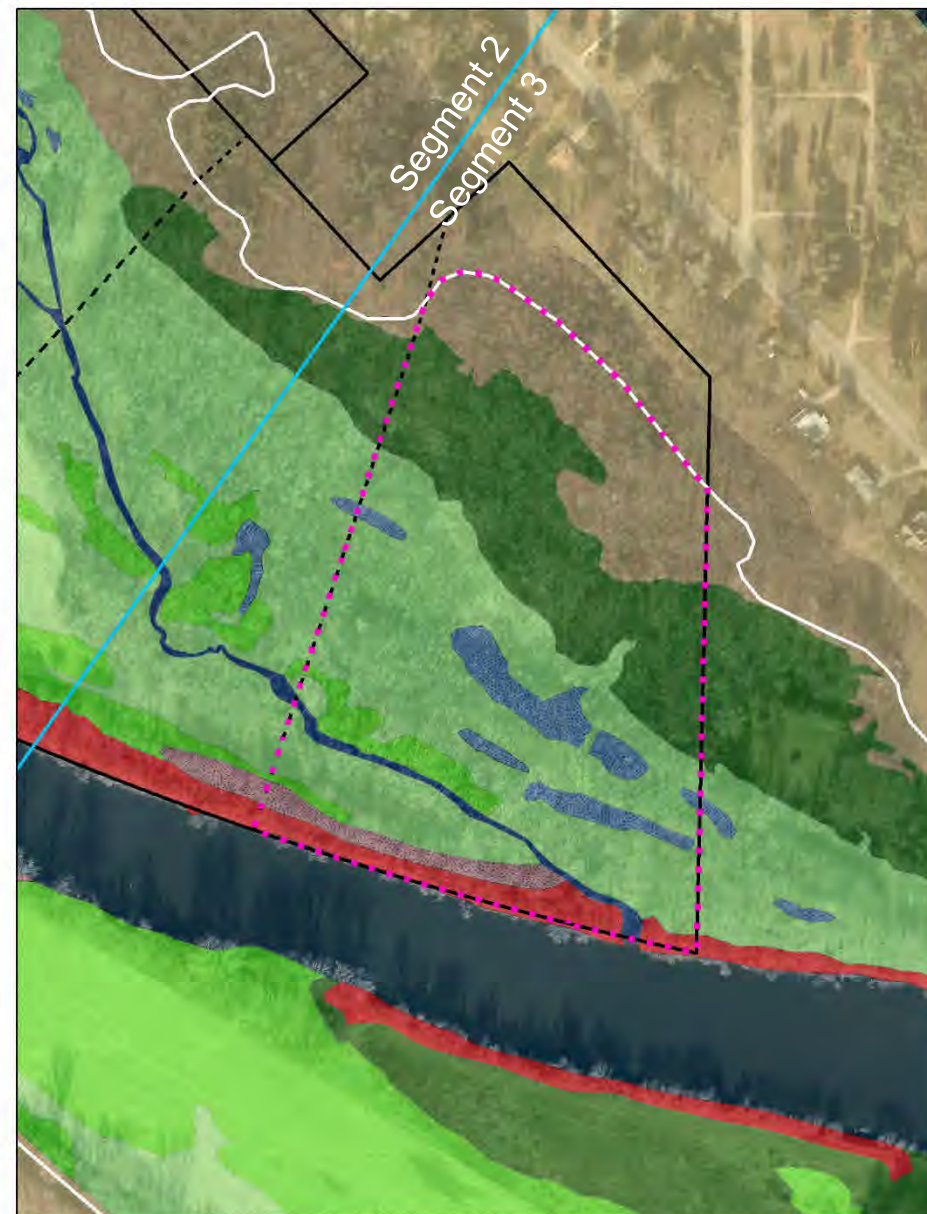
Area of DU: 20.2 acres

LAND USE VERIFIED

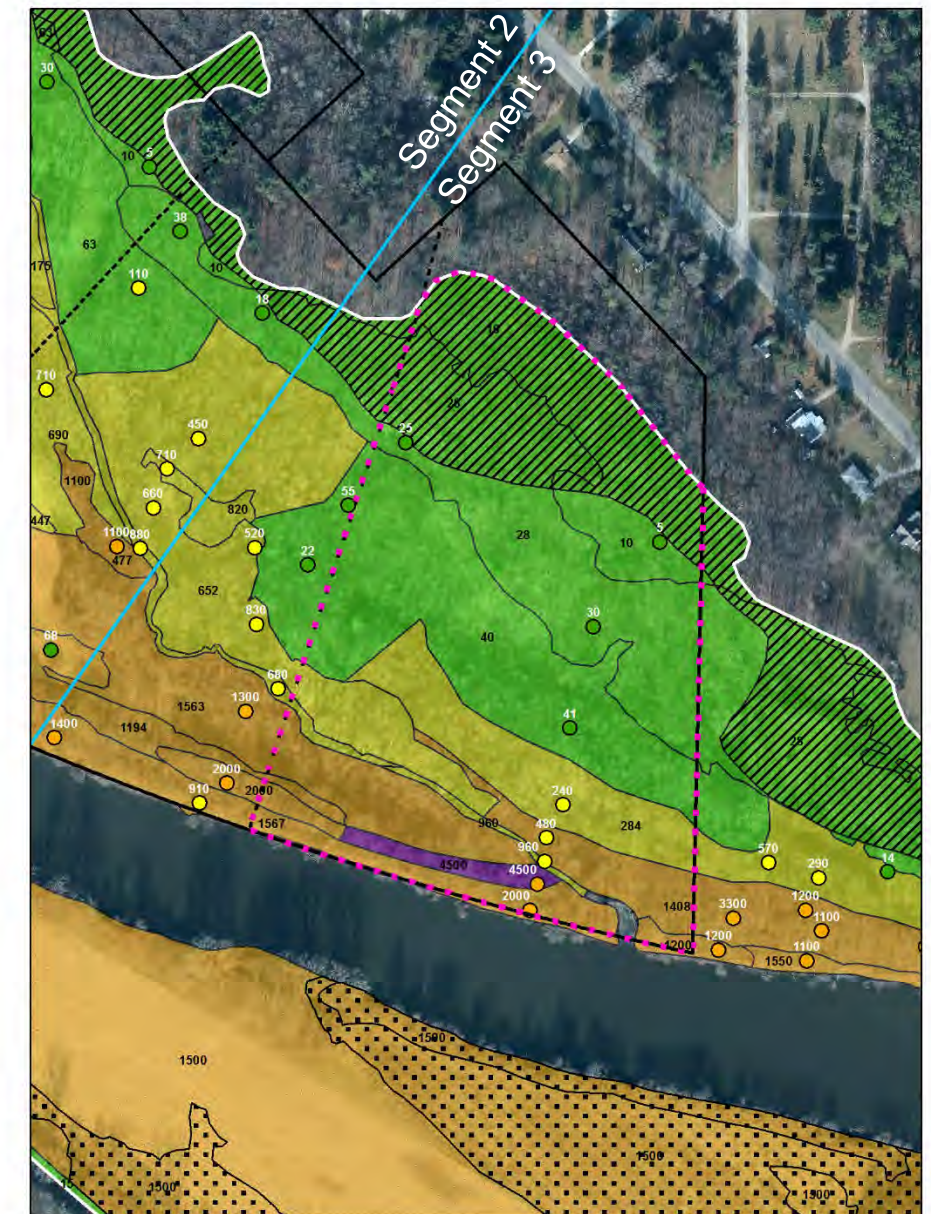
Aerial Background



Geomorphic Polygons



SAC Polygons and Existing Samples

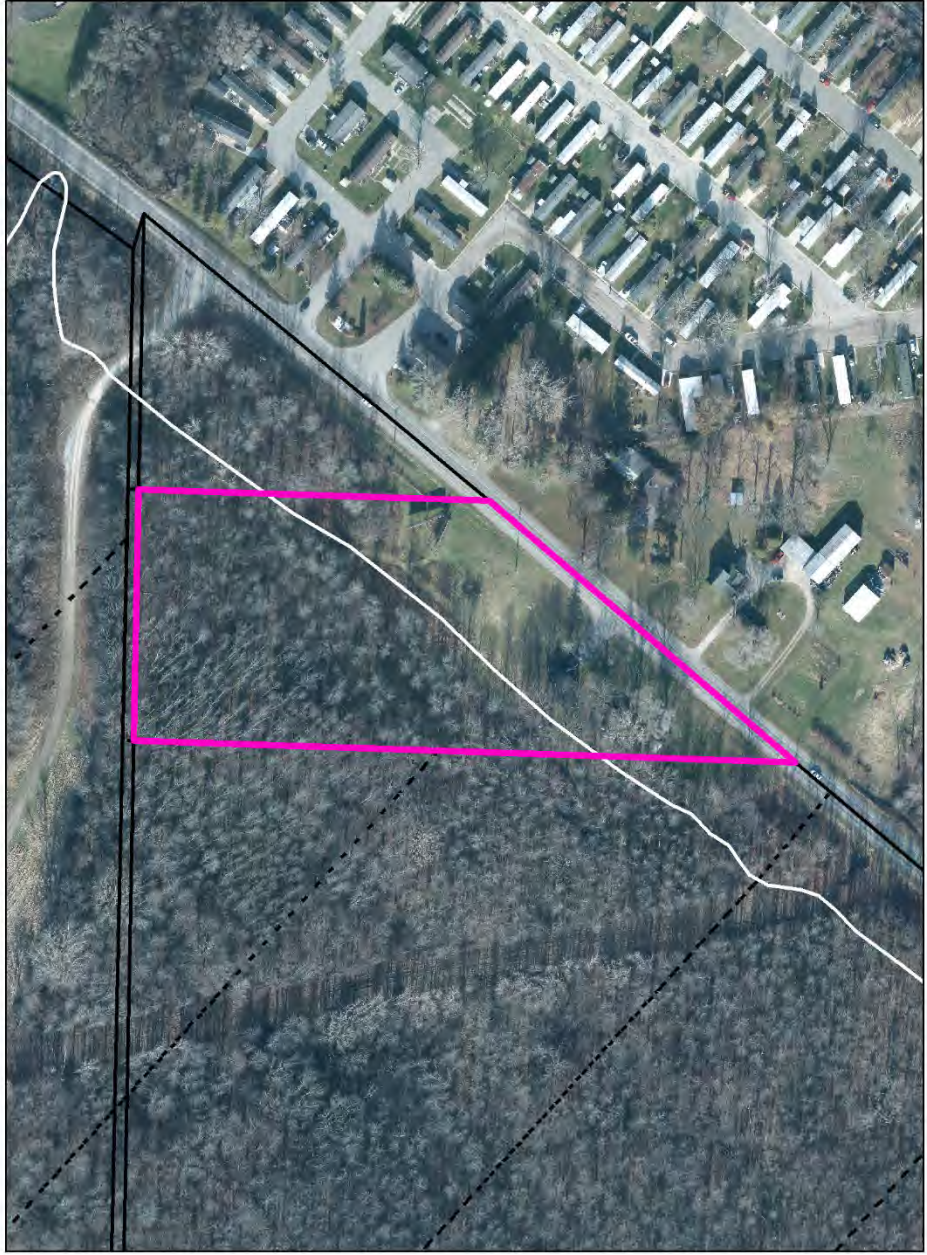


Area in 8-year Floodplain: 2.9 acres

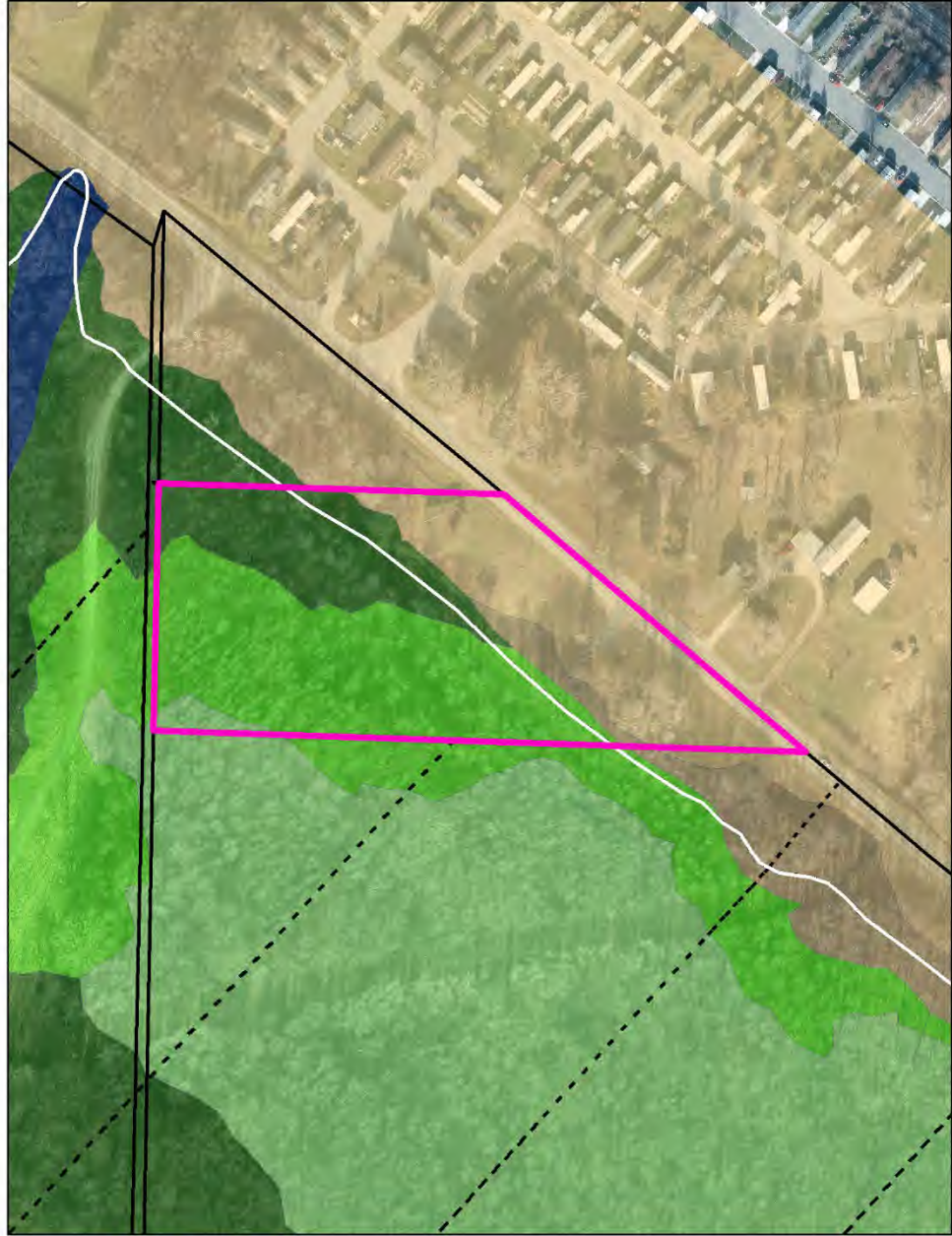
Area of Maintained Land in 8-Year Floodplain: 0.0 acres
Area of Other Land in 8-Year Floodplain: 2.9 acres

LAND USE VERIFIED

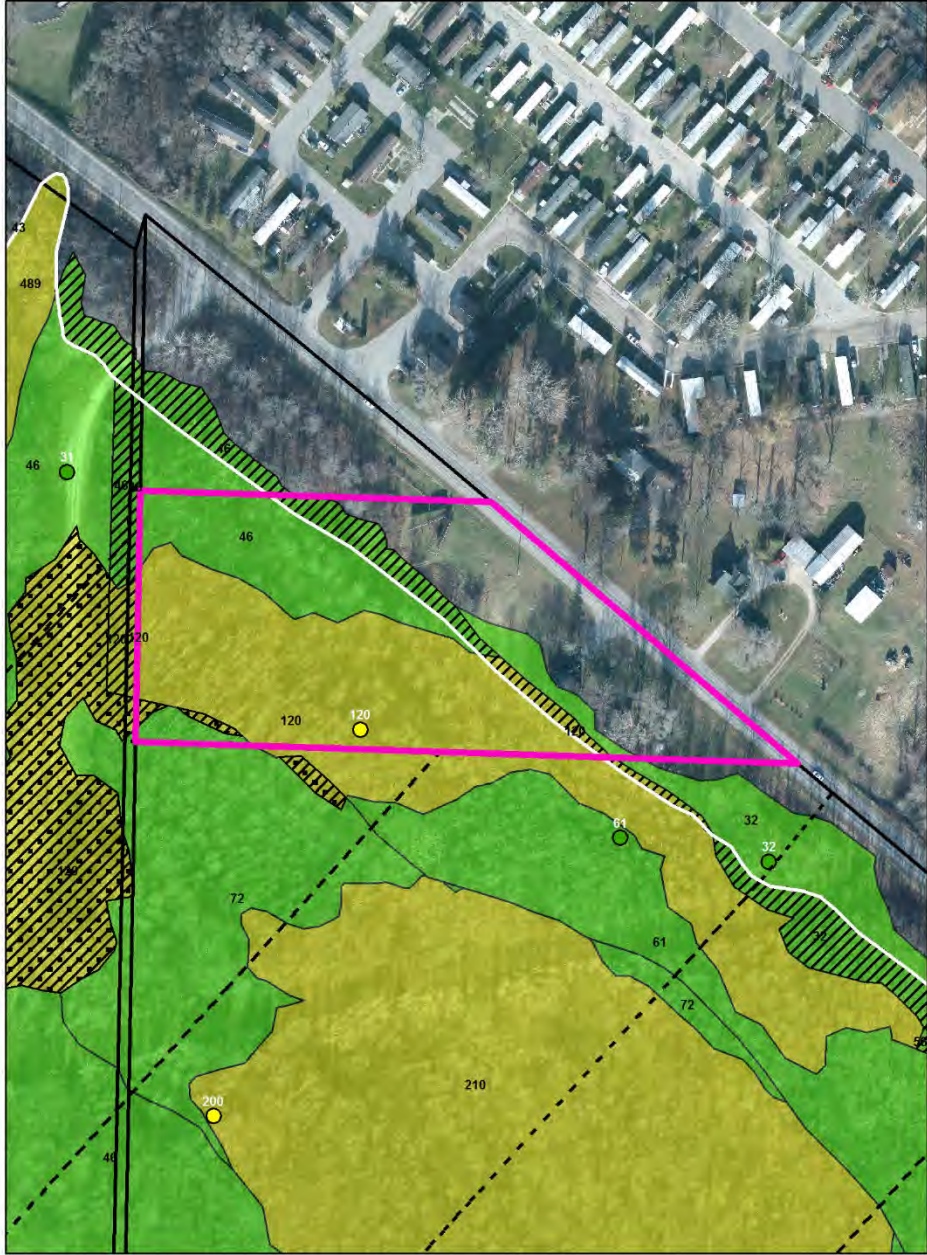
Aerial Background



Geomorphic Polygons



SAC Polygons and Existing Samples



Decision Unit ID – S2_14_DU01
Tittabawassee River Floodplain Post-Removal Site Control Plan

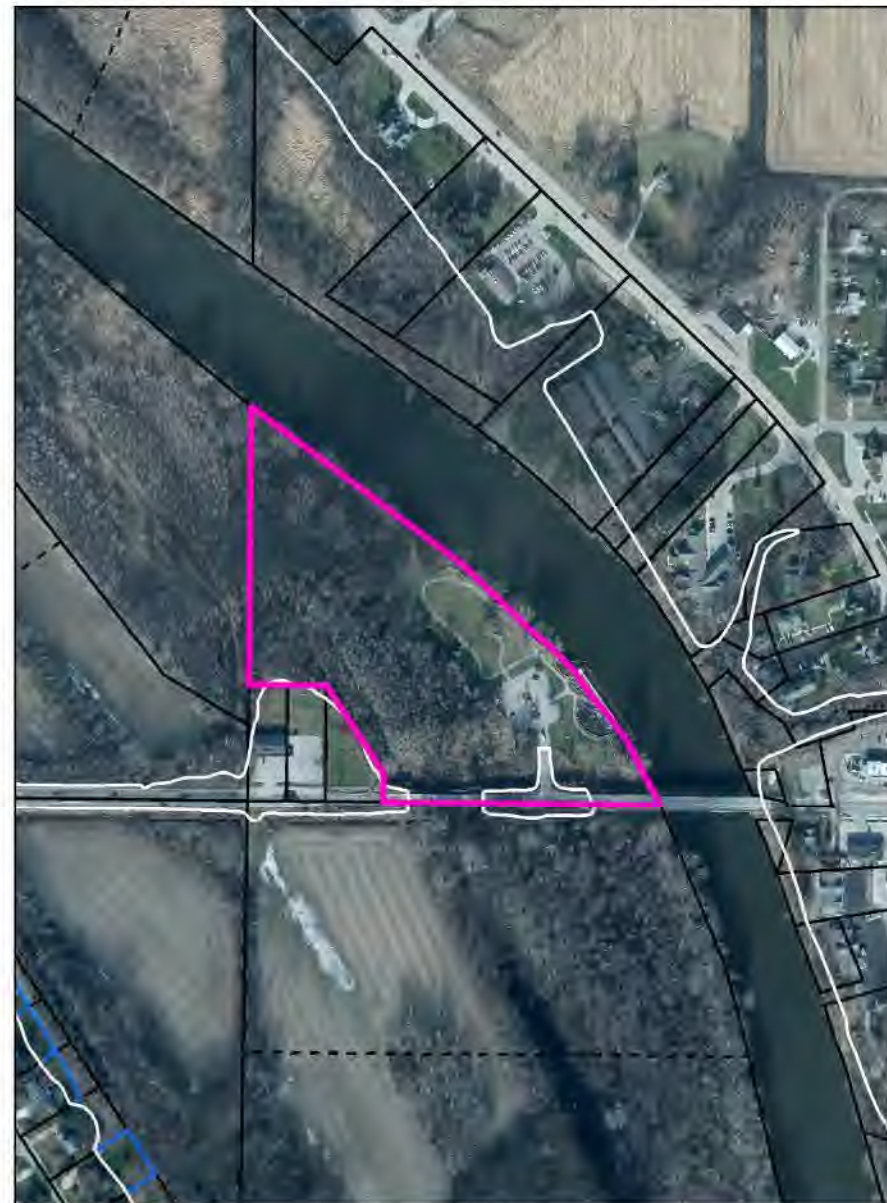
Figure
S2_14

Area in 8-year Floodplain: 12.08 acres

Area of Maintained Land in 8-Year Floodplain: 0.00 acres
Area of Other Land in 8-Year Floodplain: 12.08 acres

LAND USE VERIFIED

Aerial Background



Geomorphic Polygons



SAC Polygons and Existing Samples



Note – barrier covers were placed in this parcel area. This parcel map therefore includes an updated SWAC estimate that incorporates a revised concentration for this cover area.

Decision Unit ID – S3_095_DU01
Tittabawassee River Floodplain Post-Removal Site Control Plan

Figure
S3_095

SCREENED OUT

Area in 8-year Floodplain: 0.15 acres

Area of Maintained Land in 8-Year Floodplain: 0.00 acres
Area of Other Land in 8-Year Floodplain: 0.15 acres

Aerial Background



Geomorphic Polygons



SAC Polygons and Existing Samples

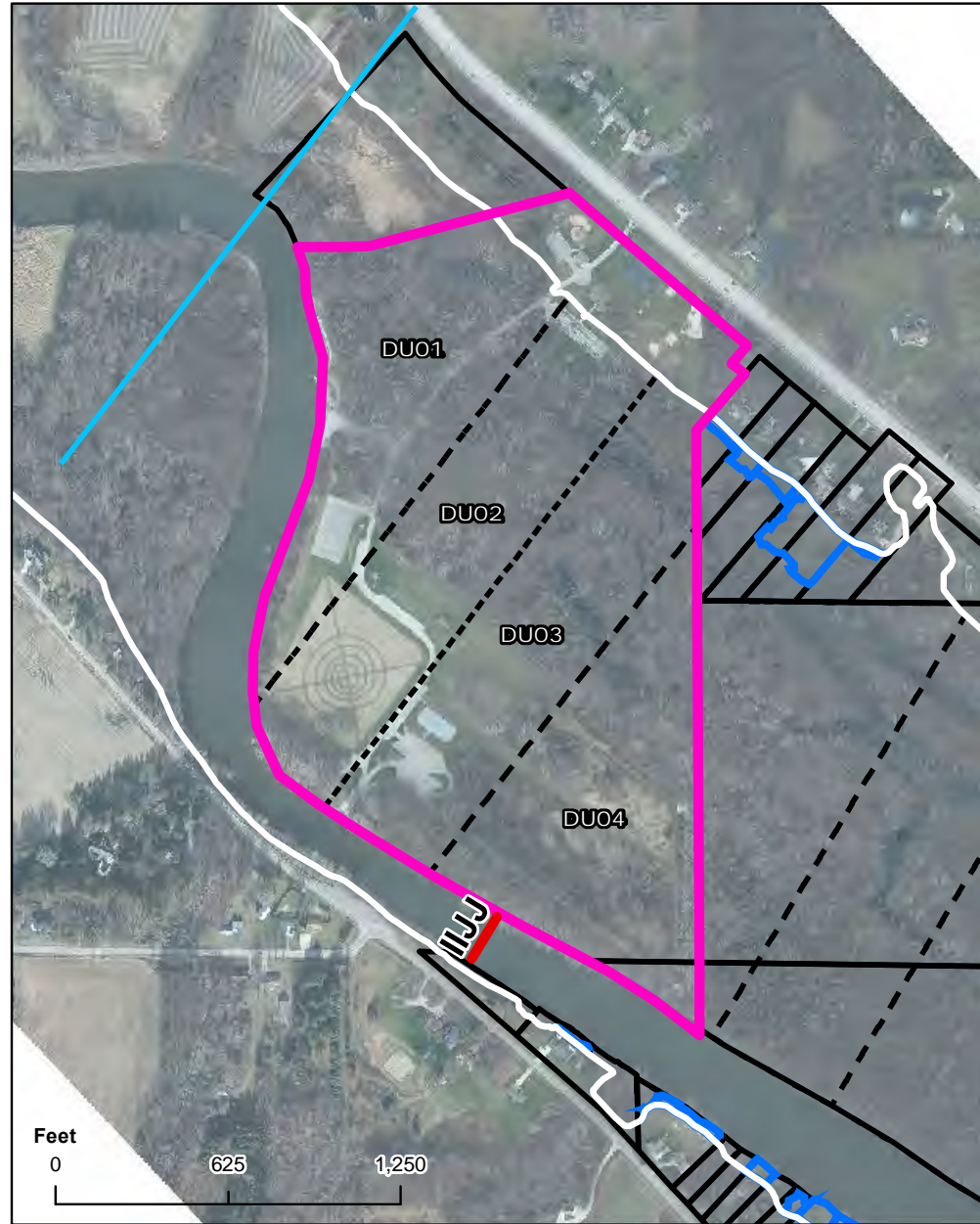


Area in 8-year Floodplain: 78.08 acres

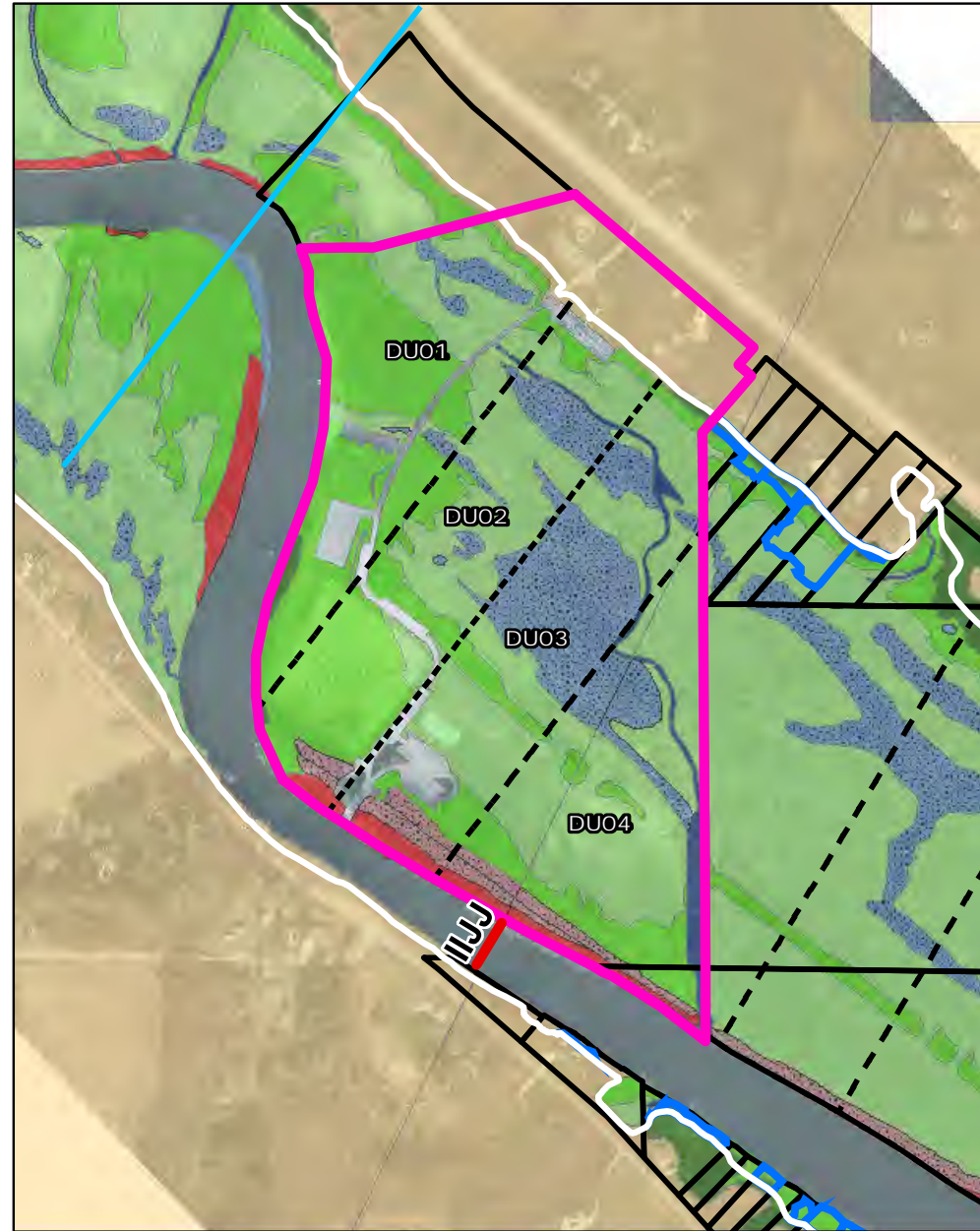
Area of Maintained Land in 8-Year Floodplain: 0.00 acres
Area of Other Land in 8-Year Floodplain: 78.08 acres

**COMBINED PARCELS
LAND USE VERIFIED**

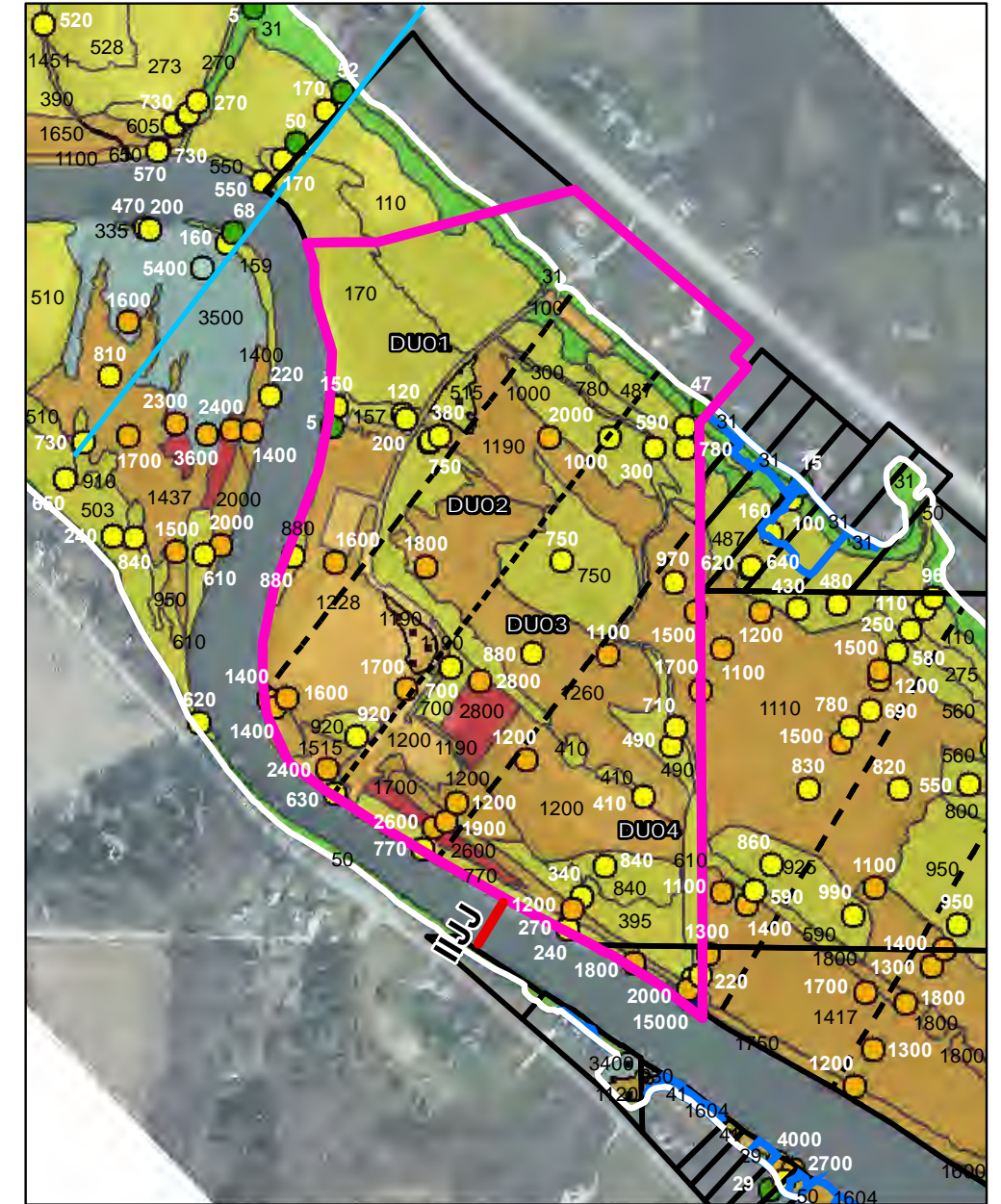
Aerial Background



Geomorphic Polygons



SAC Polygons and Existing Samples



Decision Unit ID – S5_002-003_DU01 through DU04

Tittabawassee River Floodplain Post-Removal Site Control Plan
Appendix B

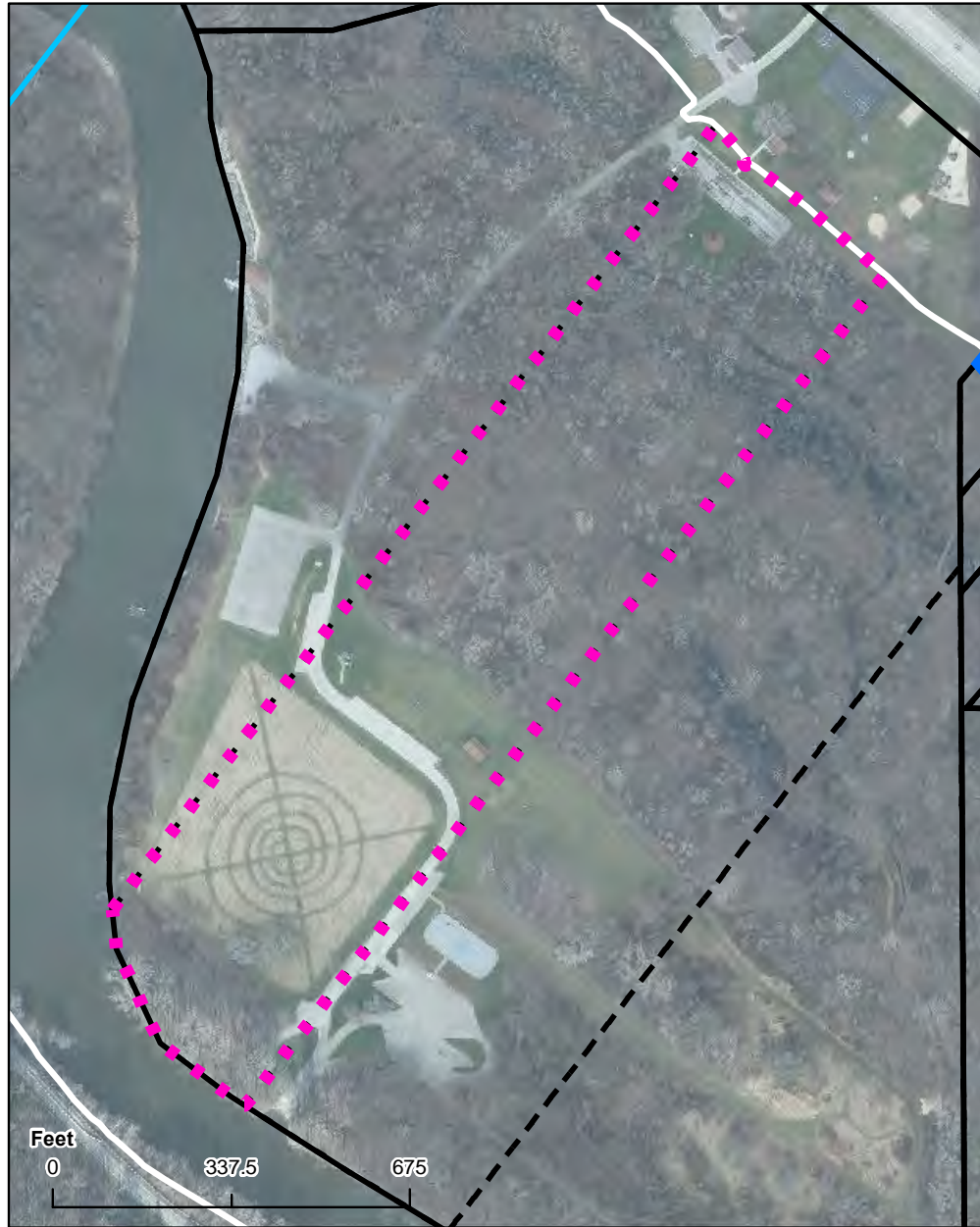
Figure
S5_002-003

Area in 8-year Floodplain: 78.08 acres

Area of DU02: 19.25 acres

**LAND USE VERIFIED
COMBINED PARCELS**

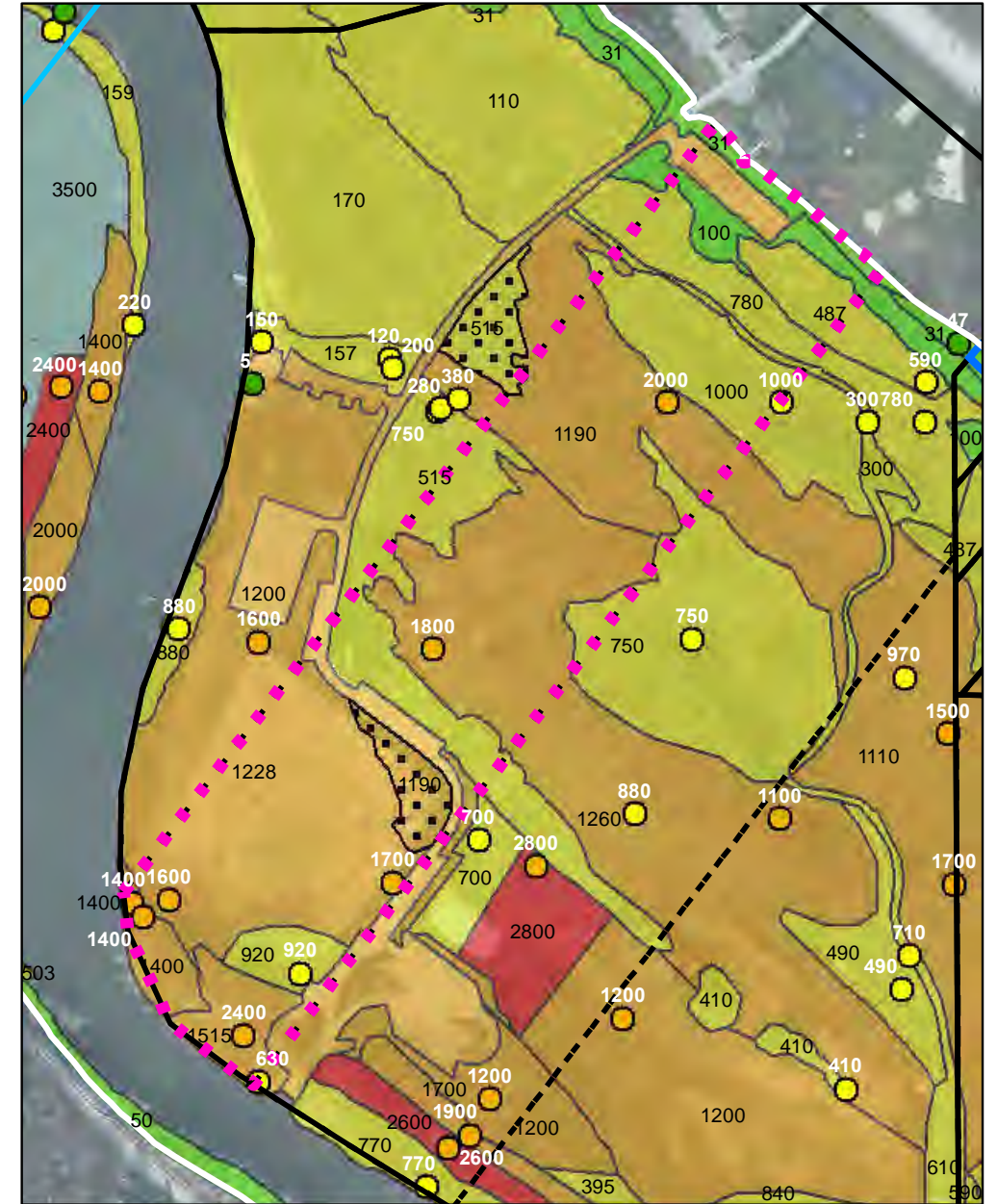
Aerial Background



Geomorphic Polygons



SAC Polygons and Existing Samples

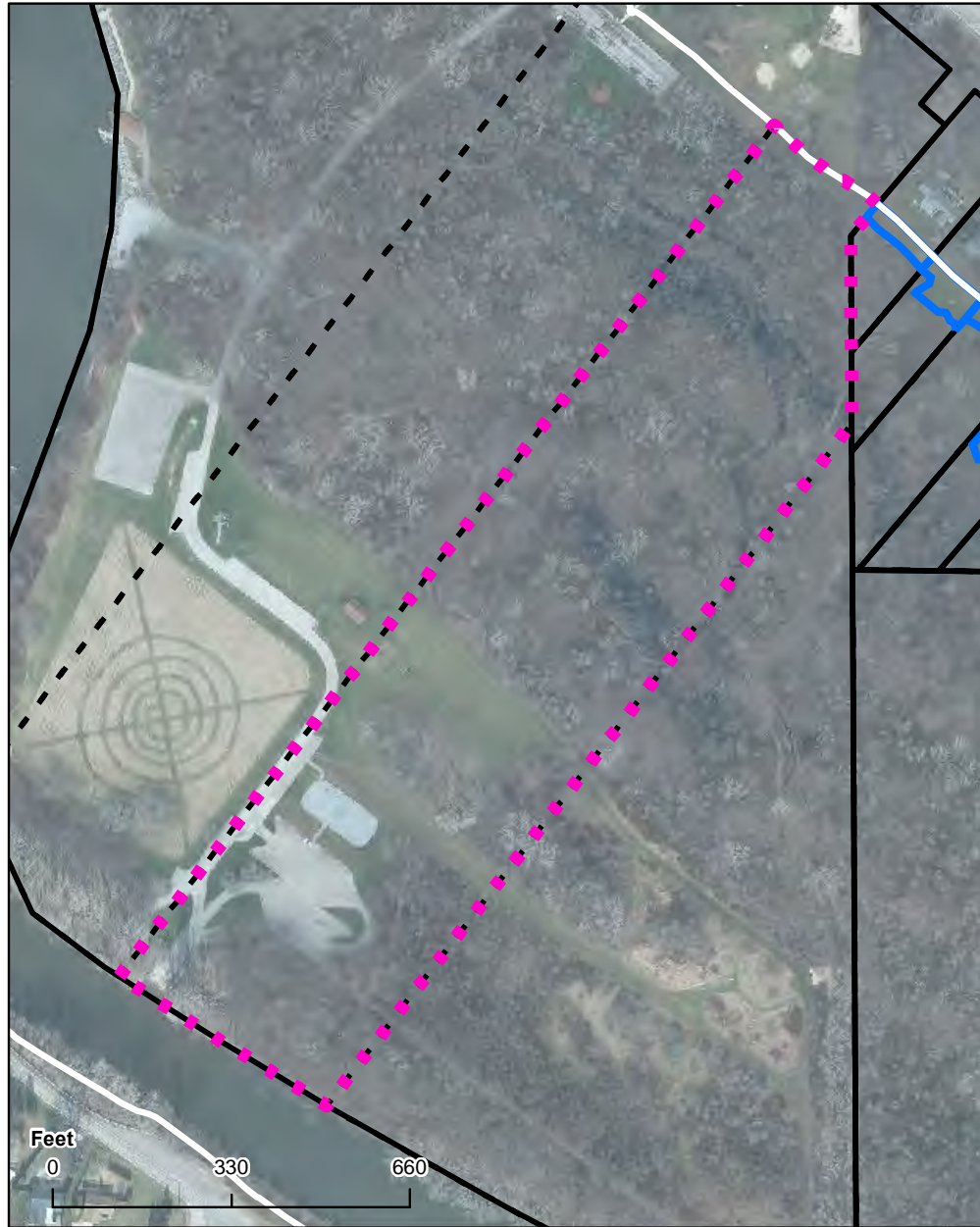


Area in 8-year Floodplain: 78.08 acres

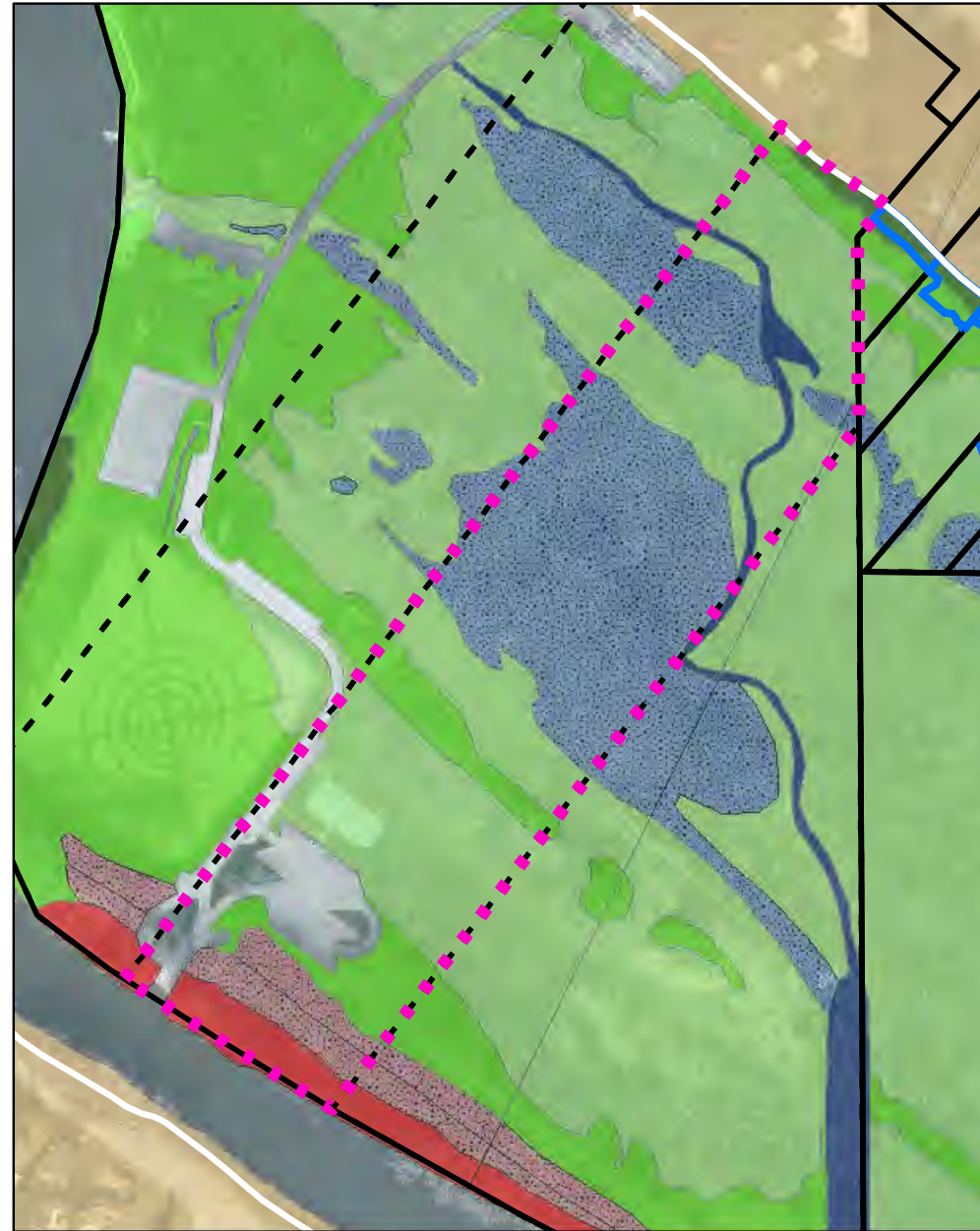
Area of DU03: 19.24 acres

**LAND USE VERIFIED
COMBINED PARCELS**

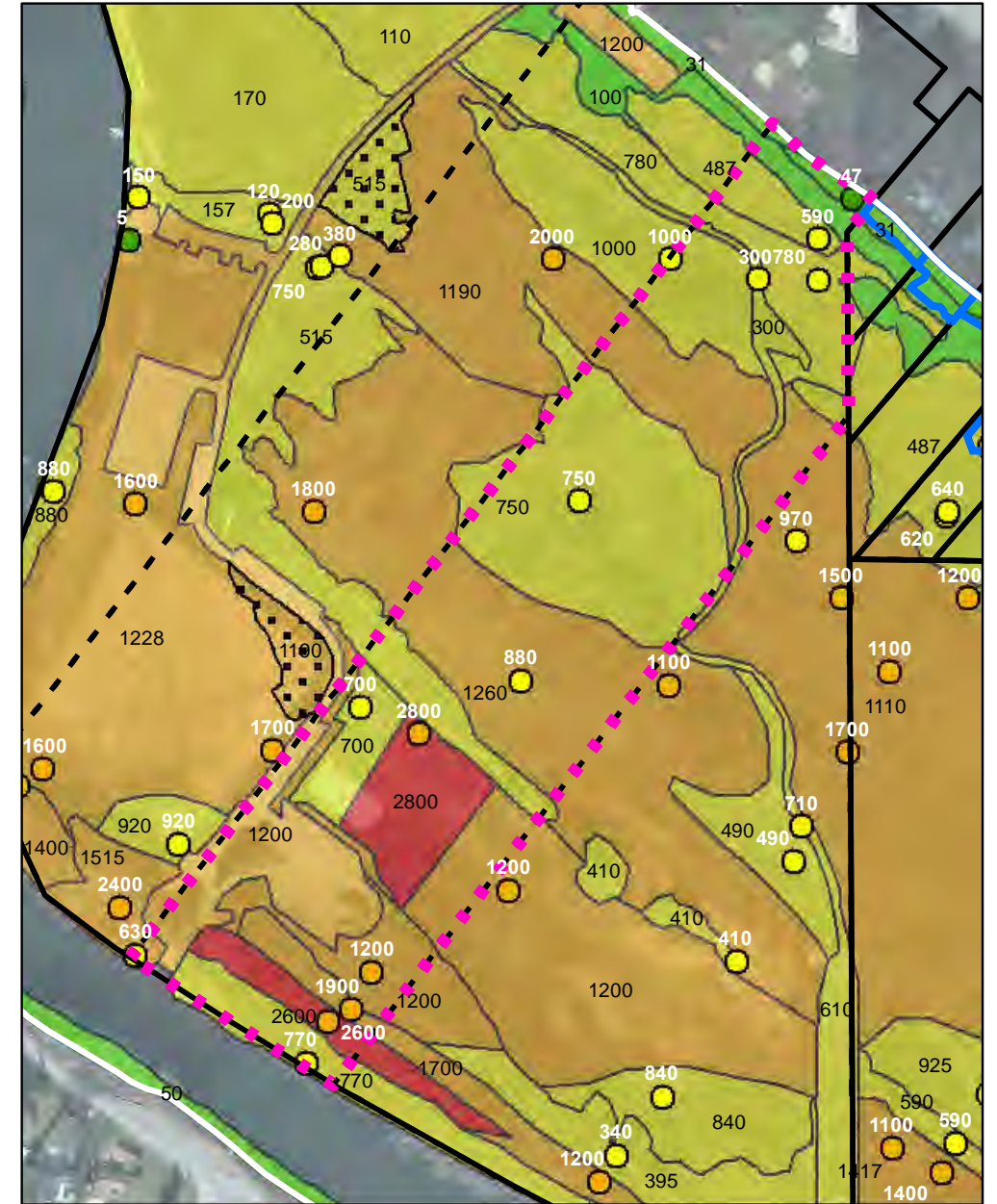
Aerial Background



Geomorphic Polygons



SAC Polygons and Existing Samples

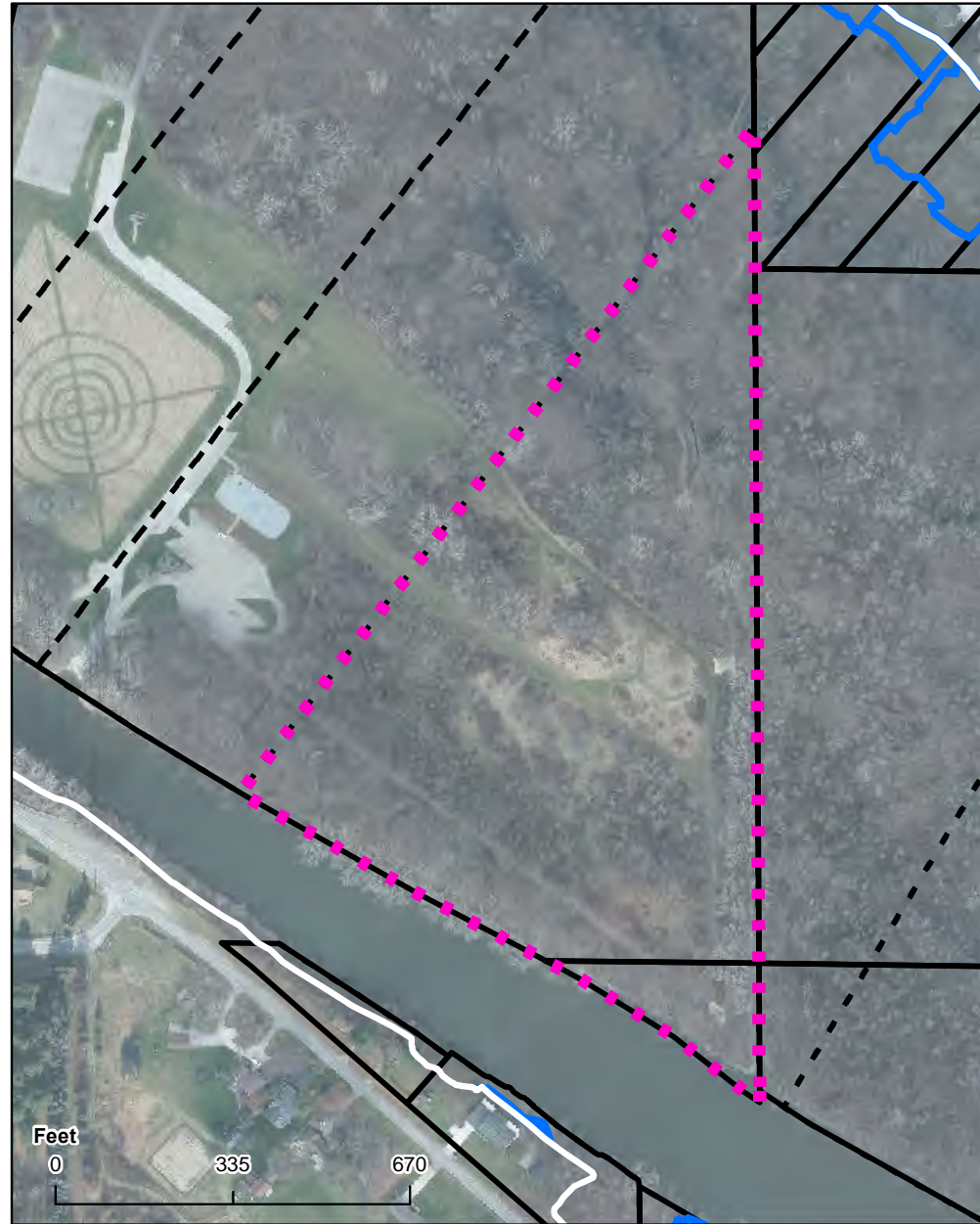


Area in 8-year Floodplain: 78.08 acres

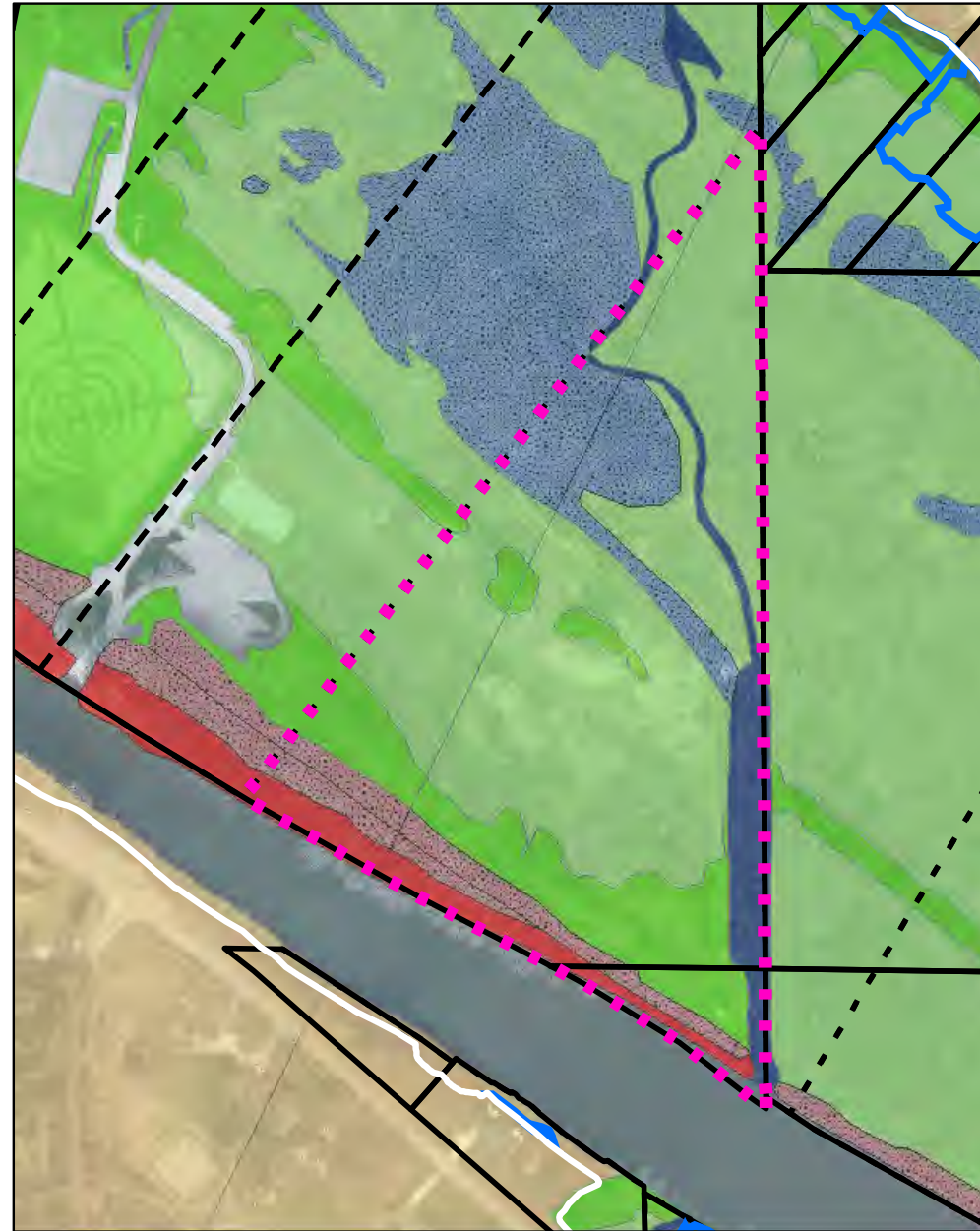
Area of DU04: 20.38 acres

**LAND USE VERIFIED
COMBINED PARCELS**

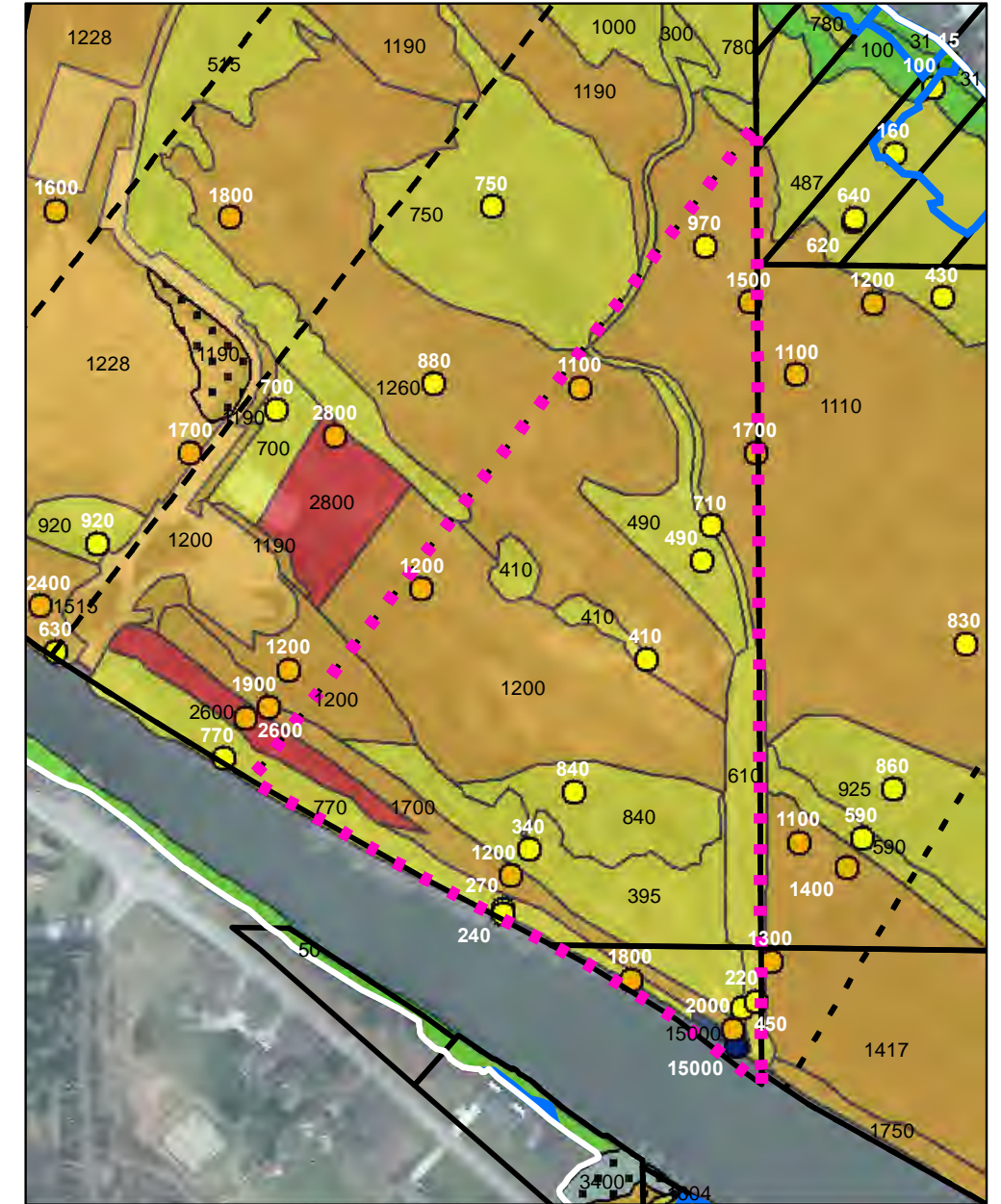
Aerial Background



Geomorphic Polygons



SAC Polygons and Existing Samples



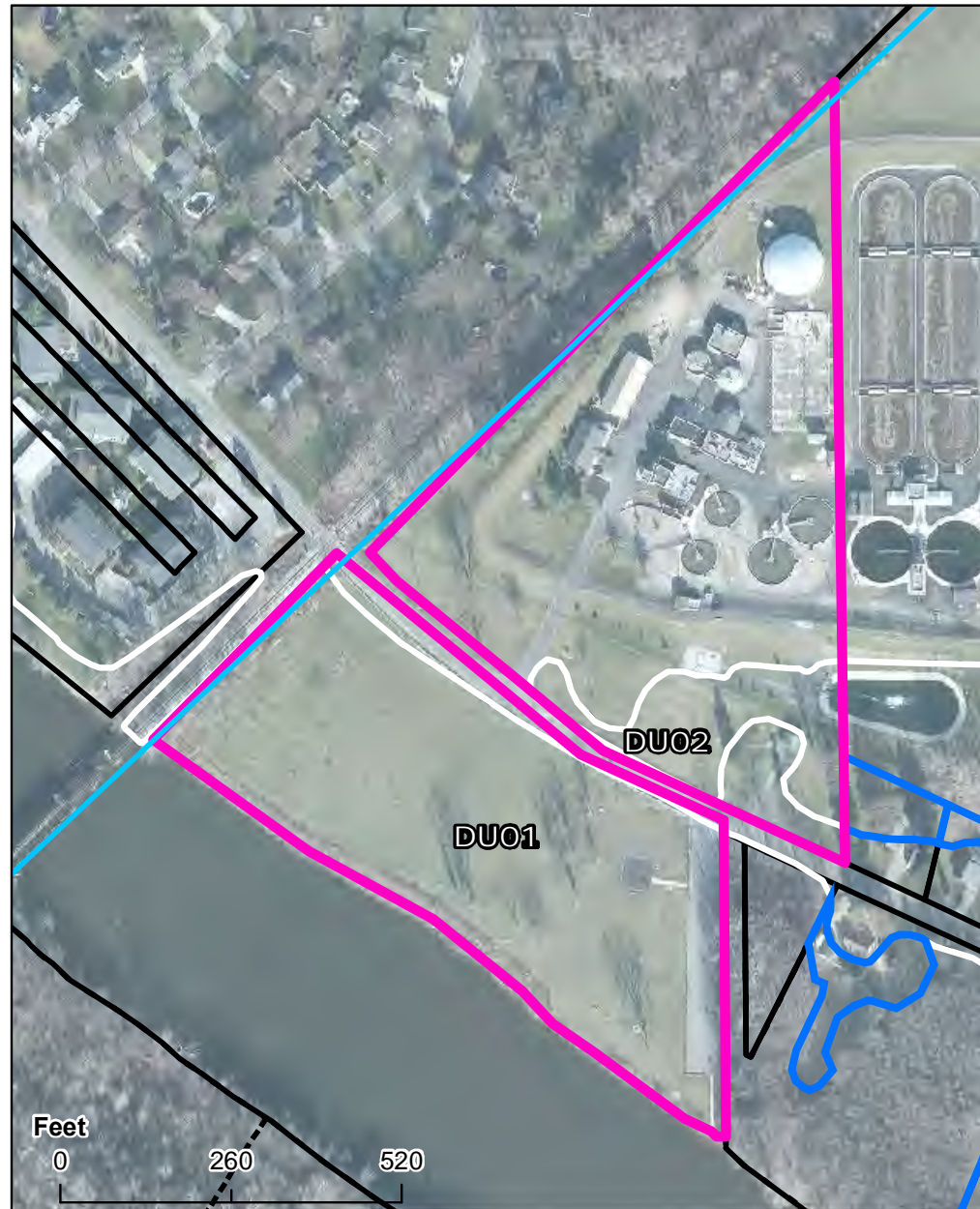
Area in 8-year Floodplain: 8.63 acres

Area of Maintained Land in 8-Year Floodplain: 0.00 acres
Area of Other Land in 8-Year Floodplain (DU01 and DU02): 8.63 acres

Rev 0 — July 27th, 2021

SCREENED OUT

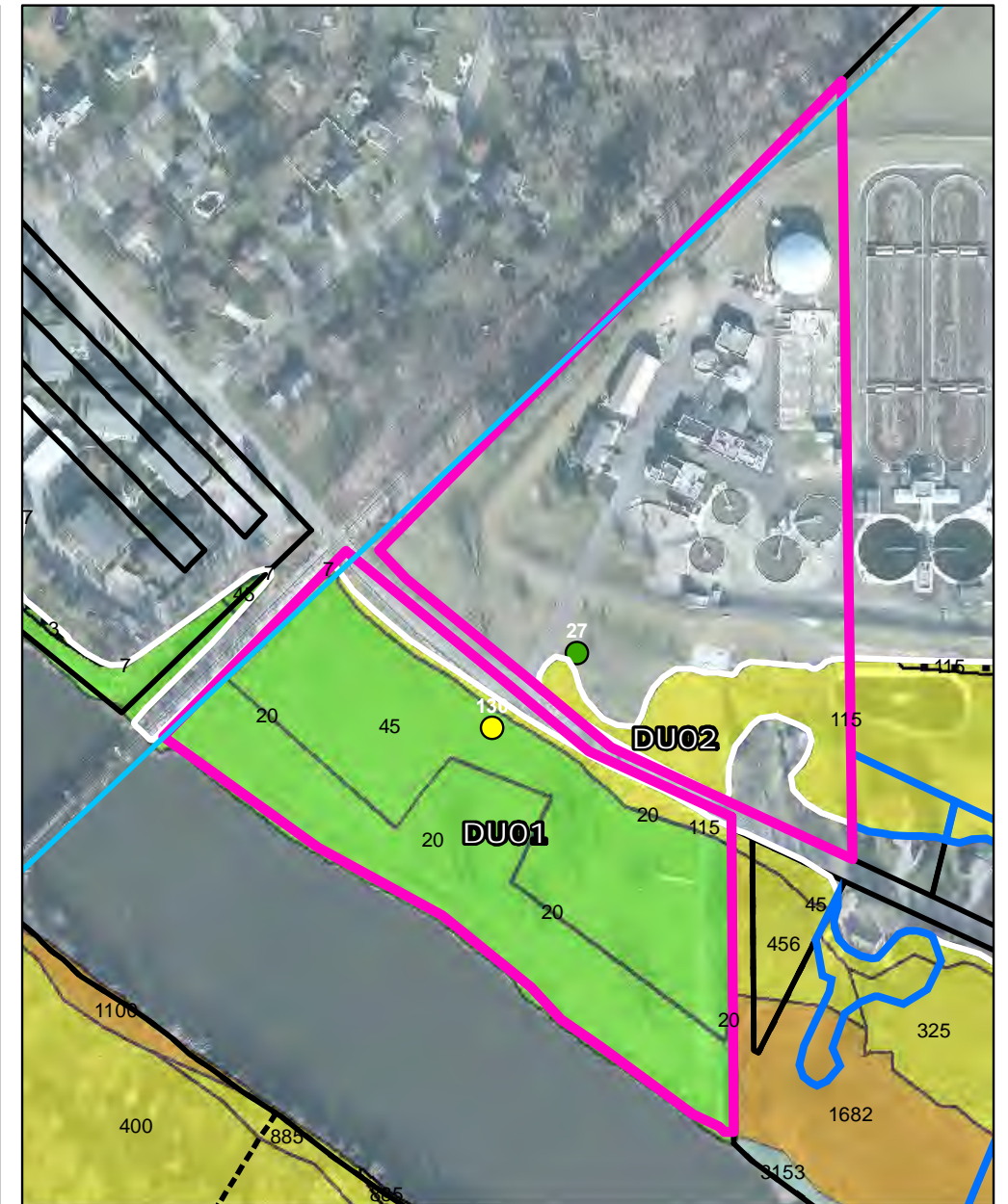
Aerial Background



Geomorphic Polygons



SAC Polygons and Existing Samples



Note: SACs based on post-remediation conditions.

Decision Unit ID – S7_001_DU01 and DU02

Tittabawassee River Floodplain Post-Removal Site Control Plan
Appendix B

**Figure
S7_001**

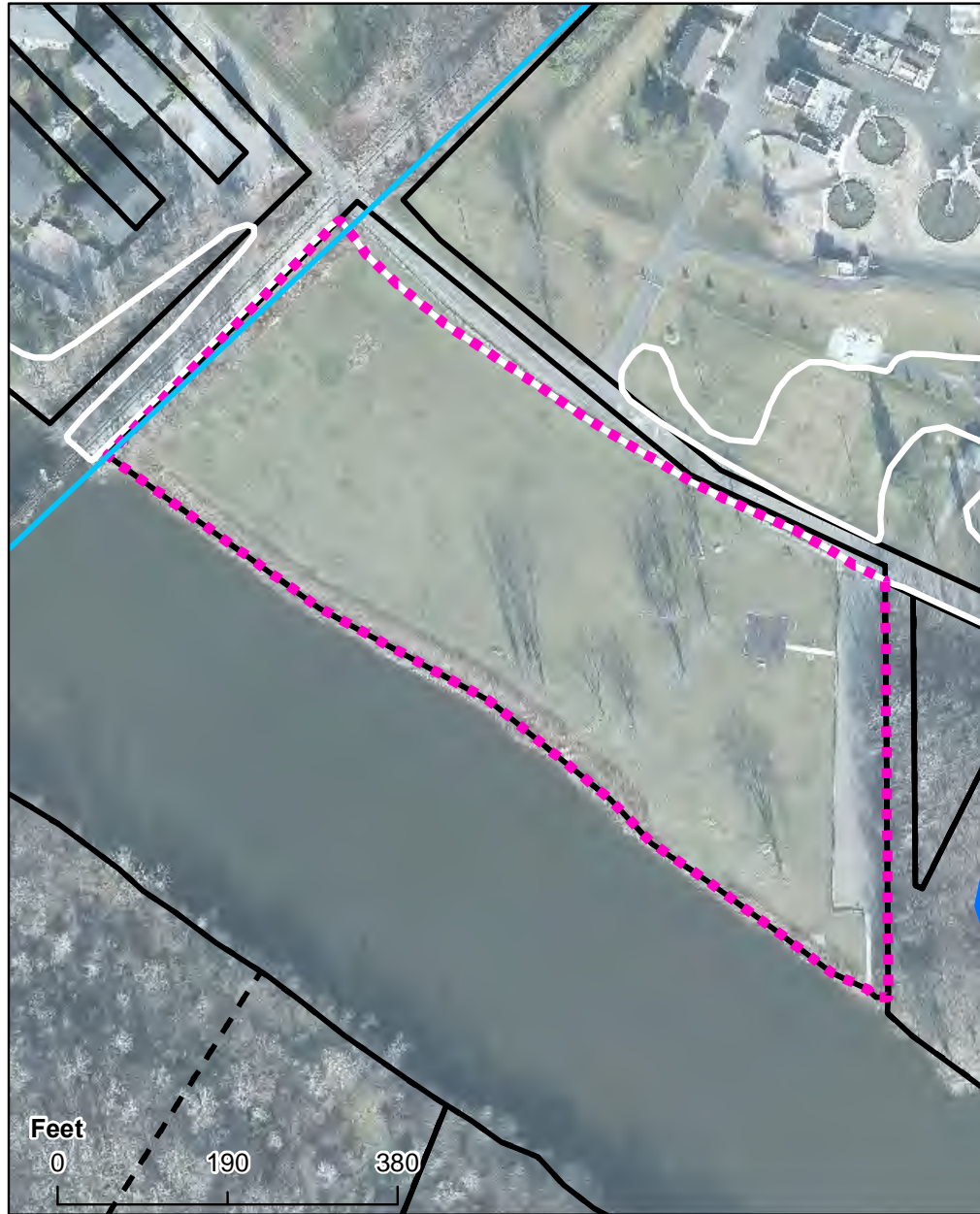
Area in 8-year Floodplain: 8.63 acres

Area of DU: 7.35 acres

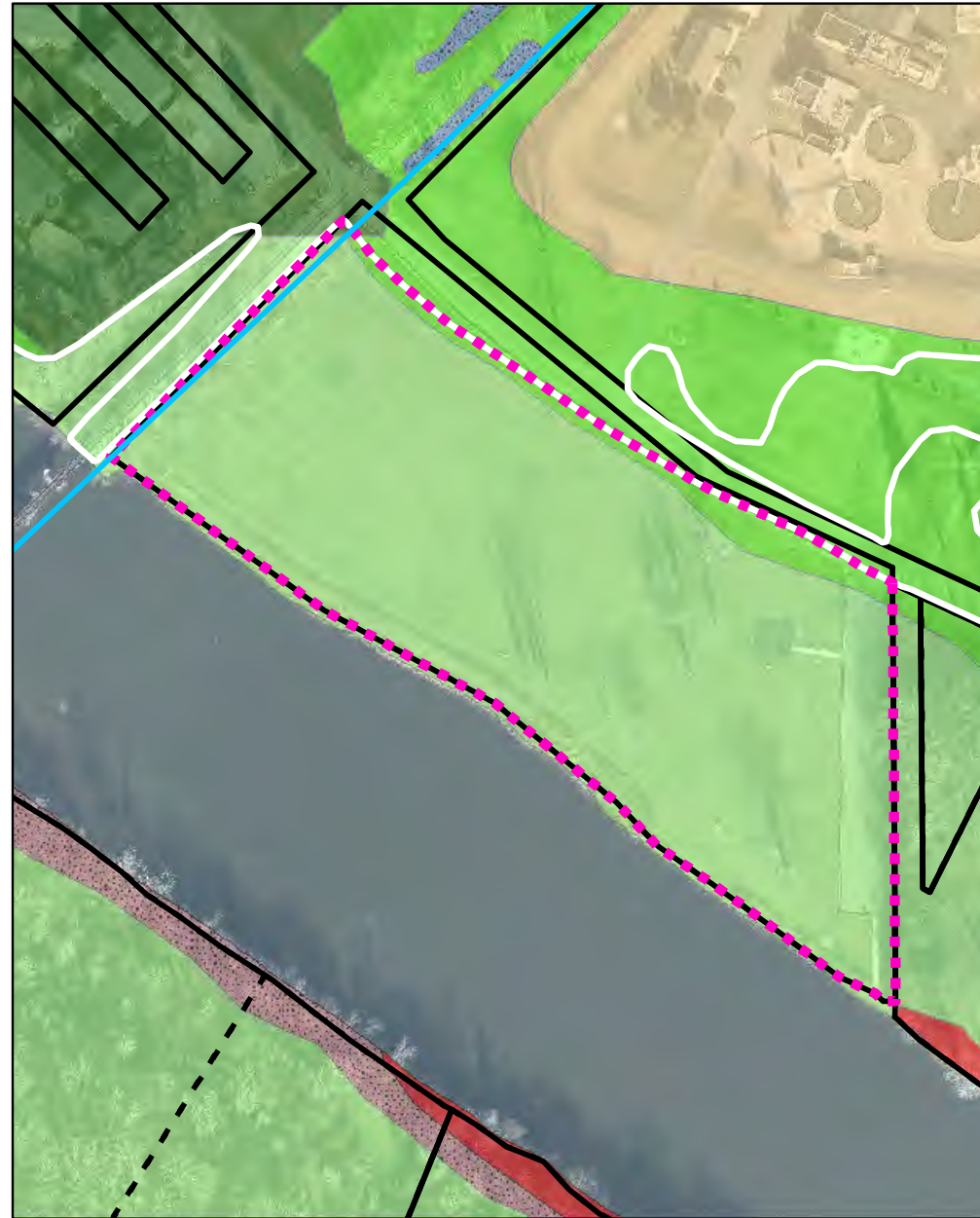
Rev 0 — July 27th, 2021

SCREENED OUT

Aerial Background



Geomorphic Polygons



SAC Polygons and Existing Samples



Note: SACs based on post-remediation conditions.

Decision Unit ID – S7_001_DU01
Tittabawassee River Floodplain Post-Removal Site Control Plan
Appendix B

Figure
S7_001_1

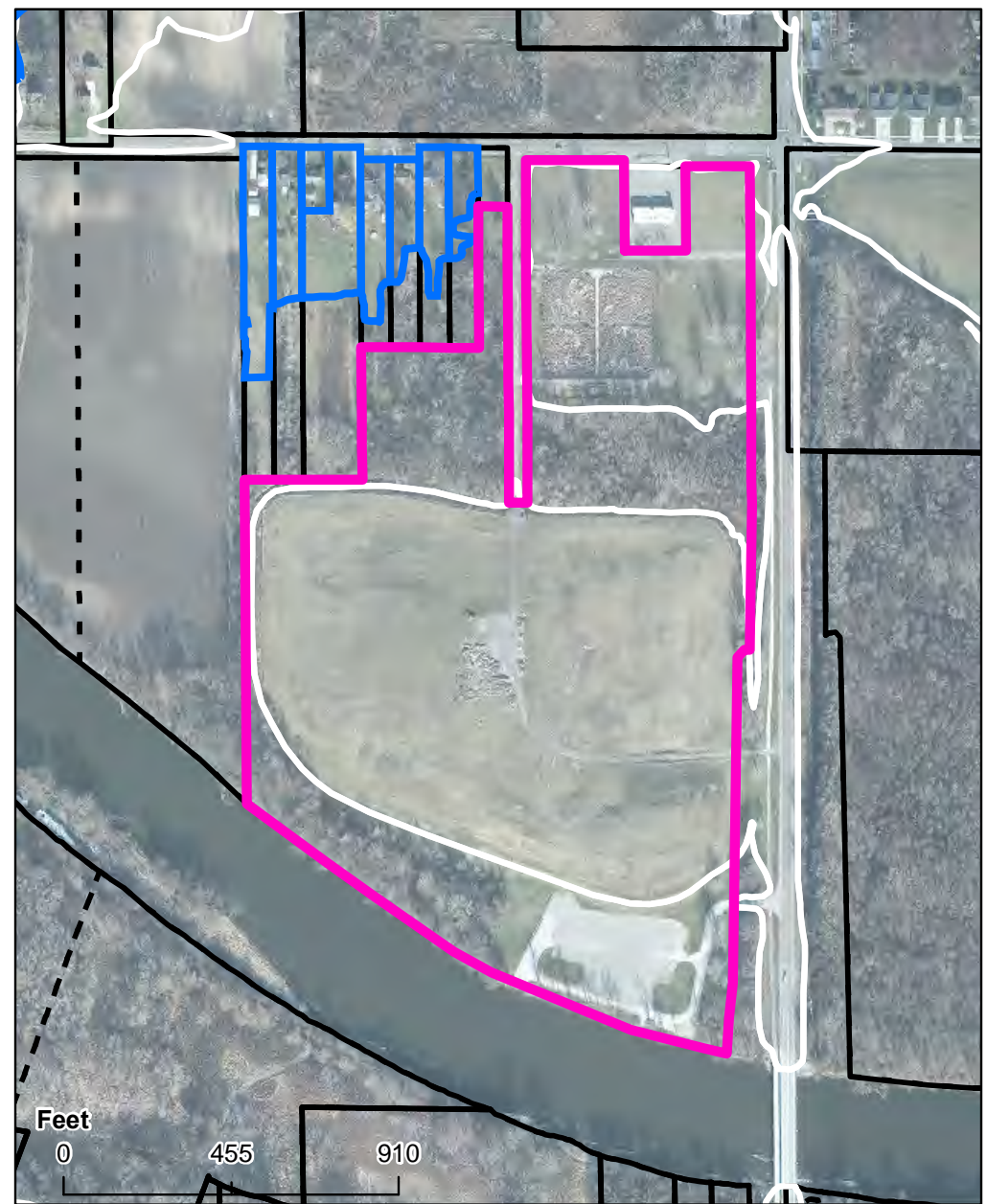
Area in 8-year Floodplain: 18.20 acres

Area of Maintained Land in 8-Year Floodplain: 0.00 acres
Area of Other Land in 8-Year Floodplain: 18.20 acres

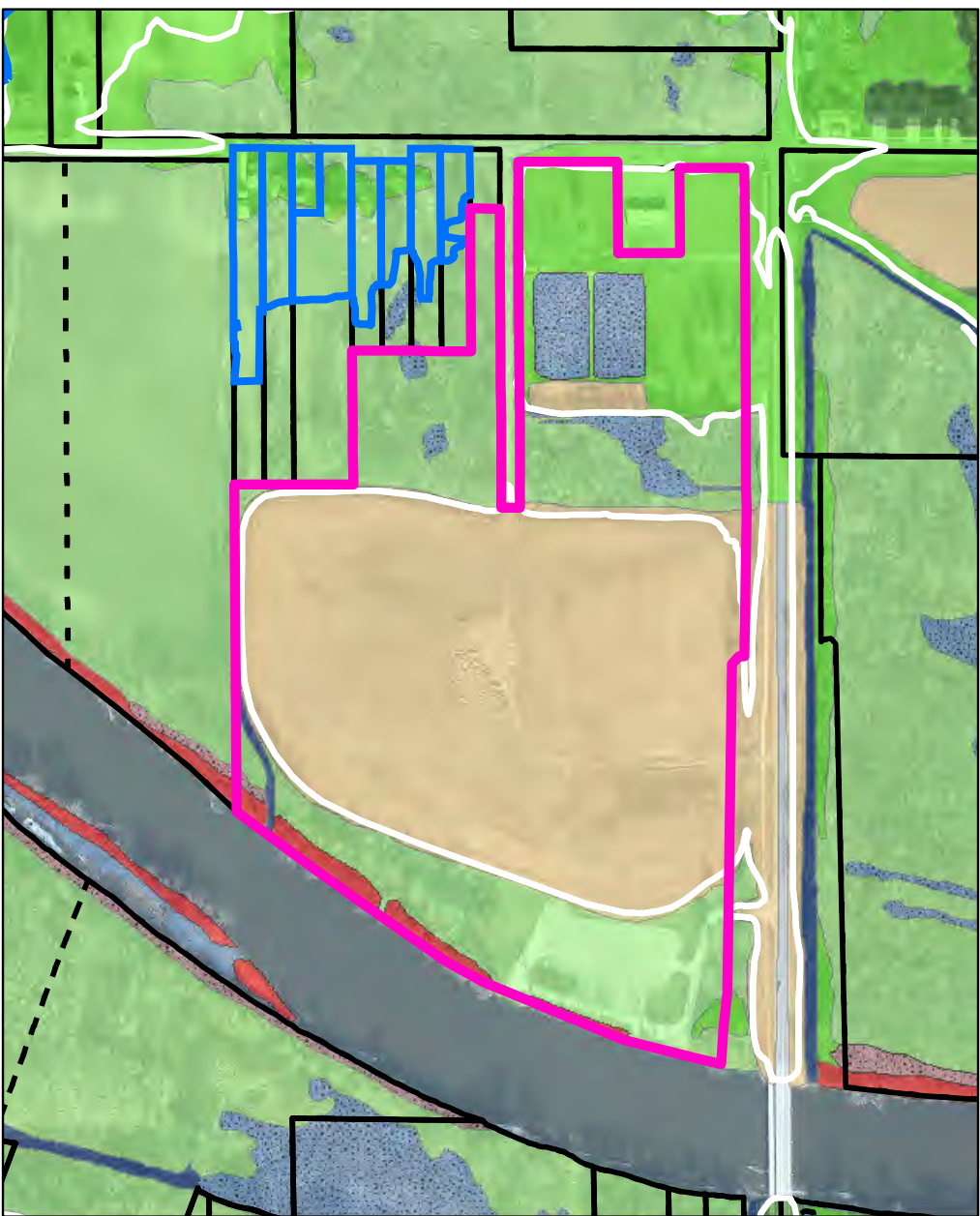
Rev 0 — July 27th, 2021

LAND USE VERIFIED

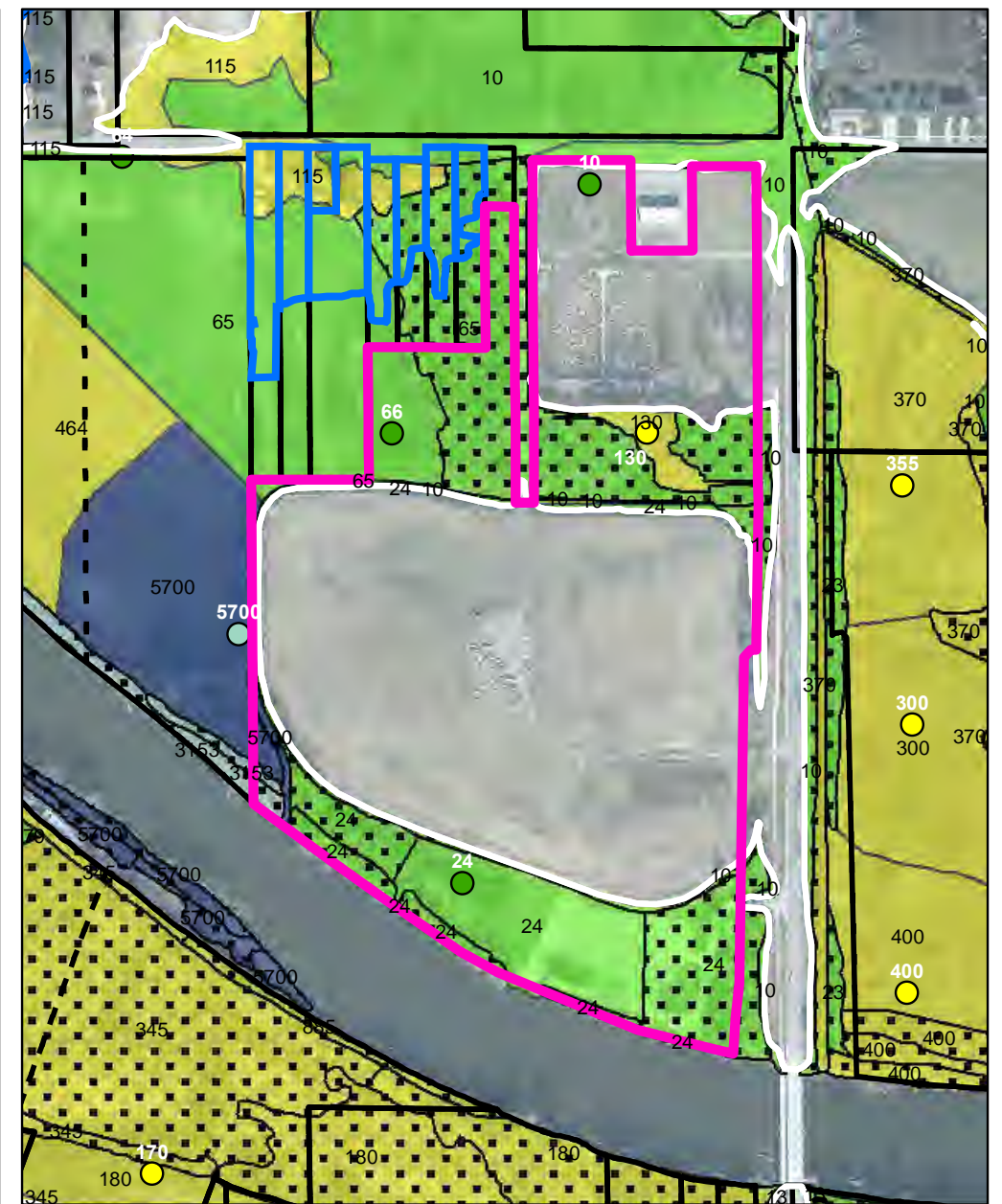
Aerial Background



Geomorphic Polygons



SAC Polygons and Existing Samples



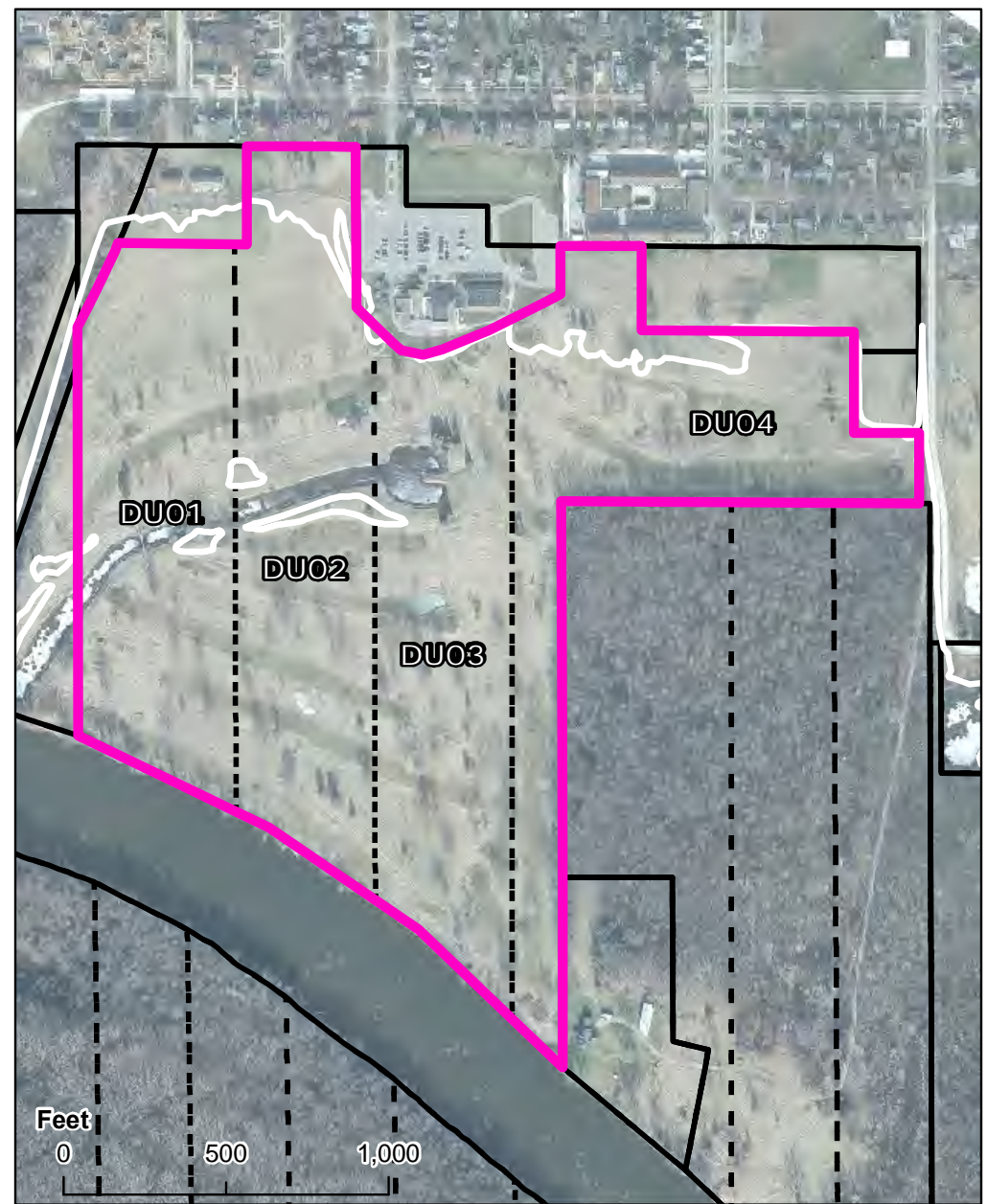
Area in 8-year Floodplain: 72.23 acres

Area of Maintained Land in 8-Year Floodplain: 0.00 acres
Area of Other Land in 8-Year Floodplain (DU01 through DU04): 72.23 acres

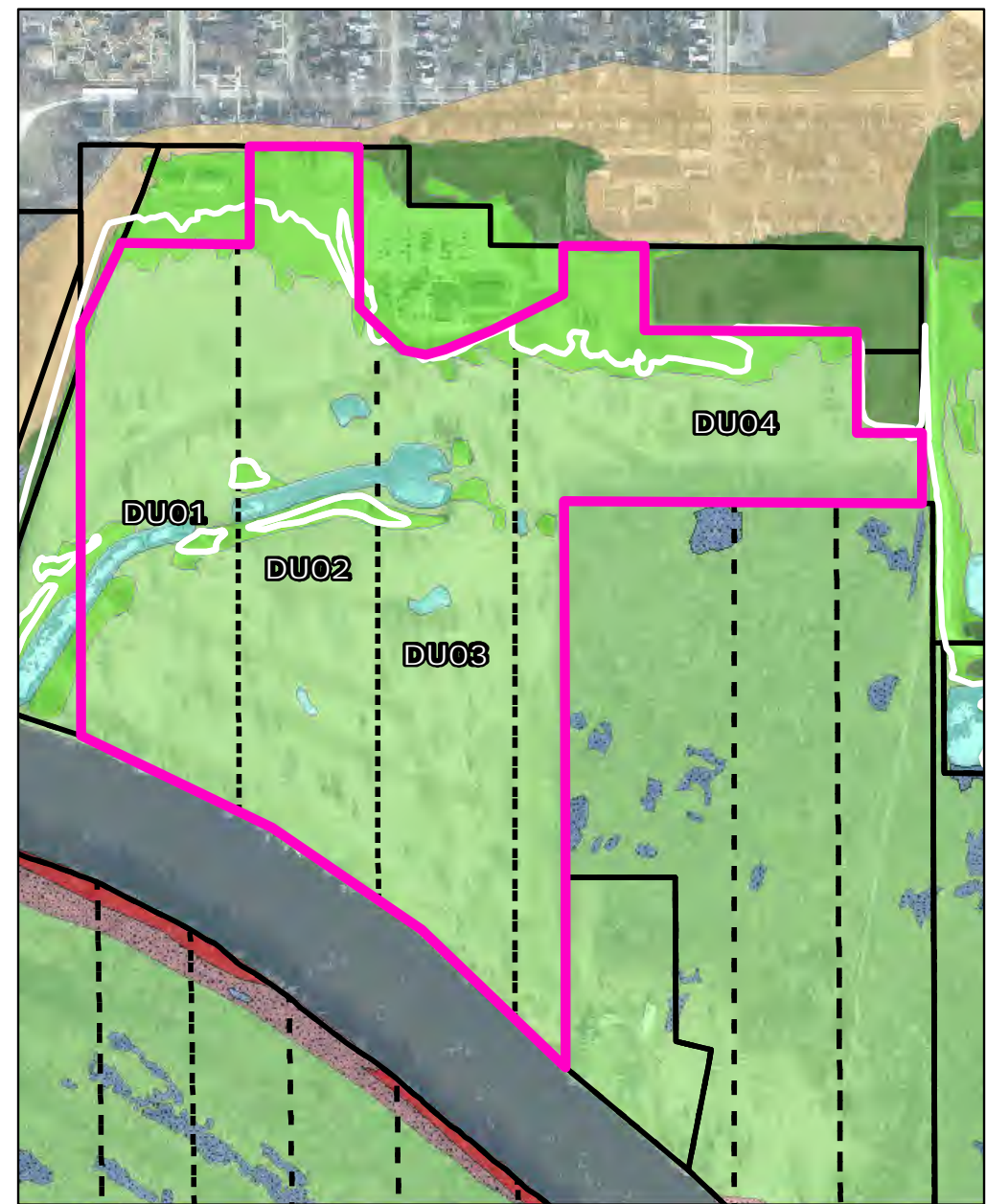
Rev 0 — July 27th, 2021

LAND USE VERIFIED

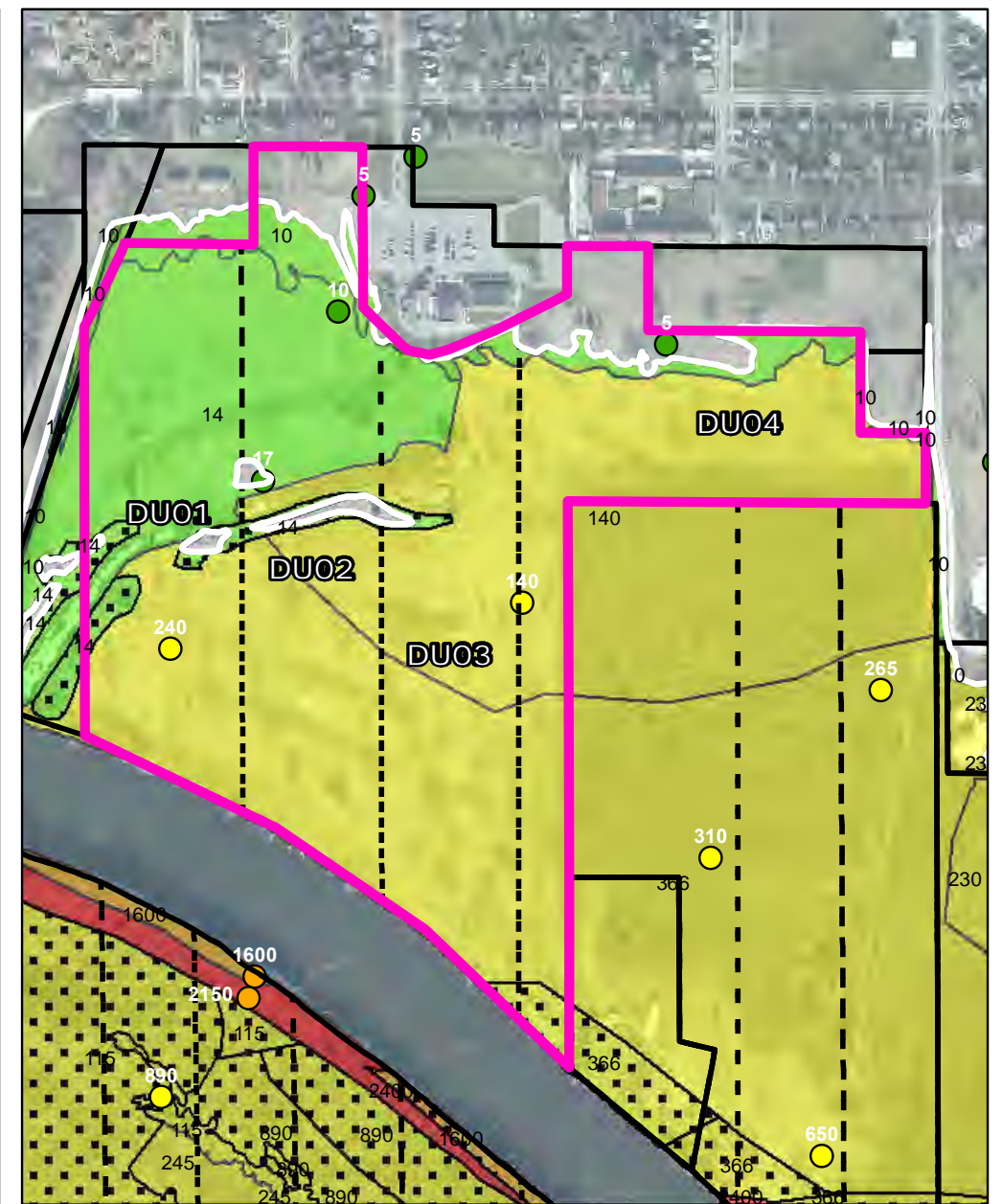
Aerial Background



Geomorphic Polygons



SAC Polygons and Existing Samples



Decision Unit ID – S7_051_DU01 through DU04
Tittabawassee River Floodplain Post-Removal Site Control Plan
Appendix B

Figure
S7_051a

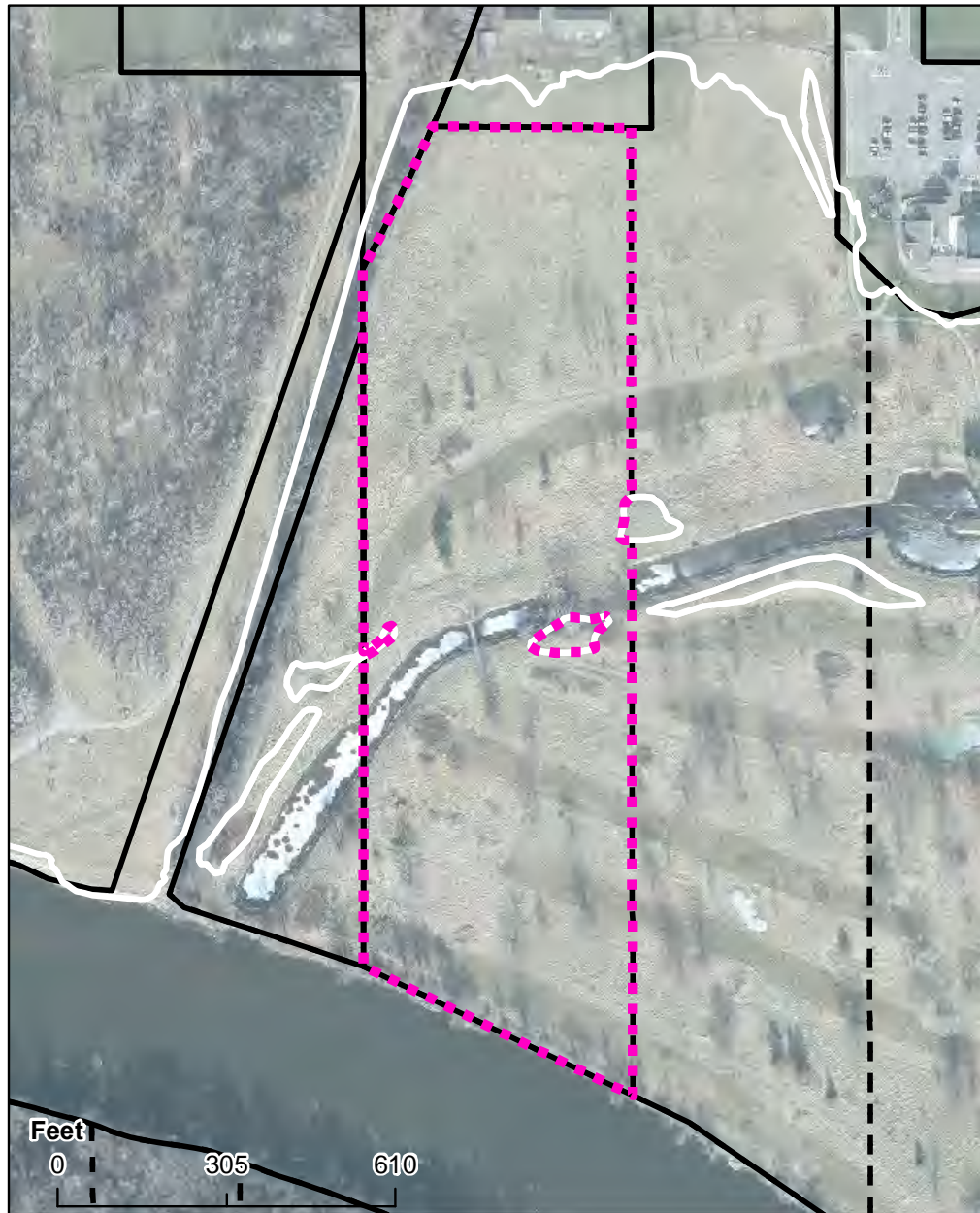
Area in 8-year Floodplain: 72.23 acres

Area of DU: 17.64 acres

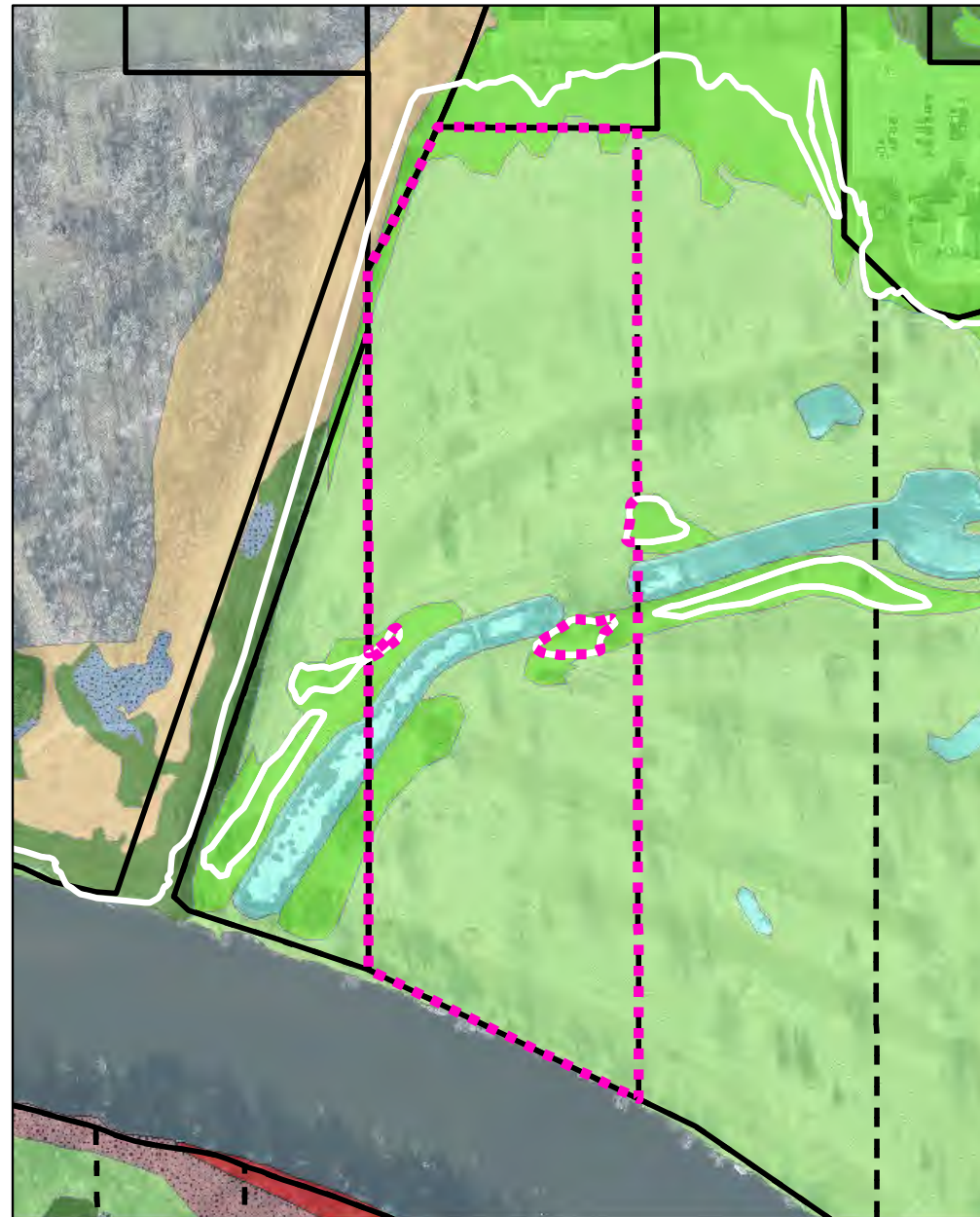
Rev 0 — July 27th, 2021

LAND USE VERIFIED

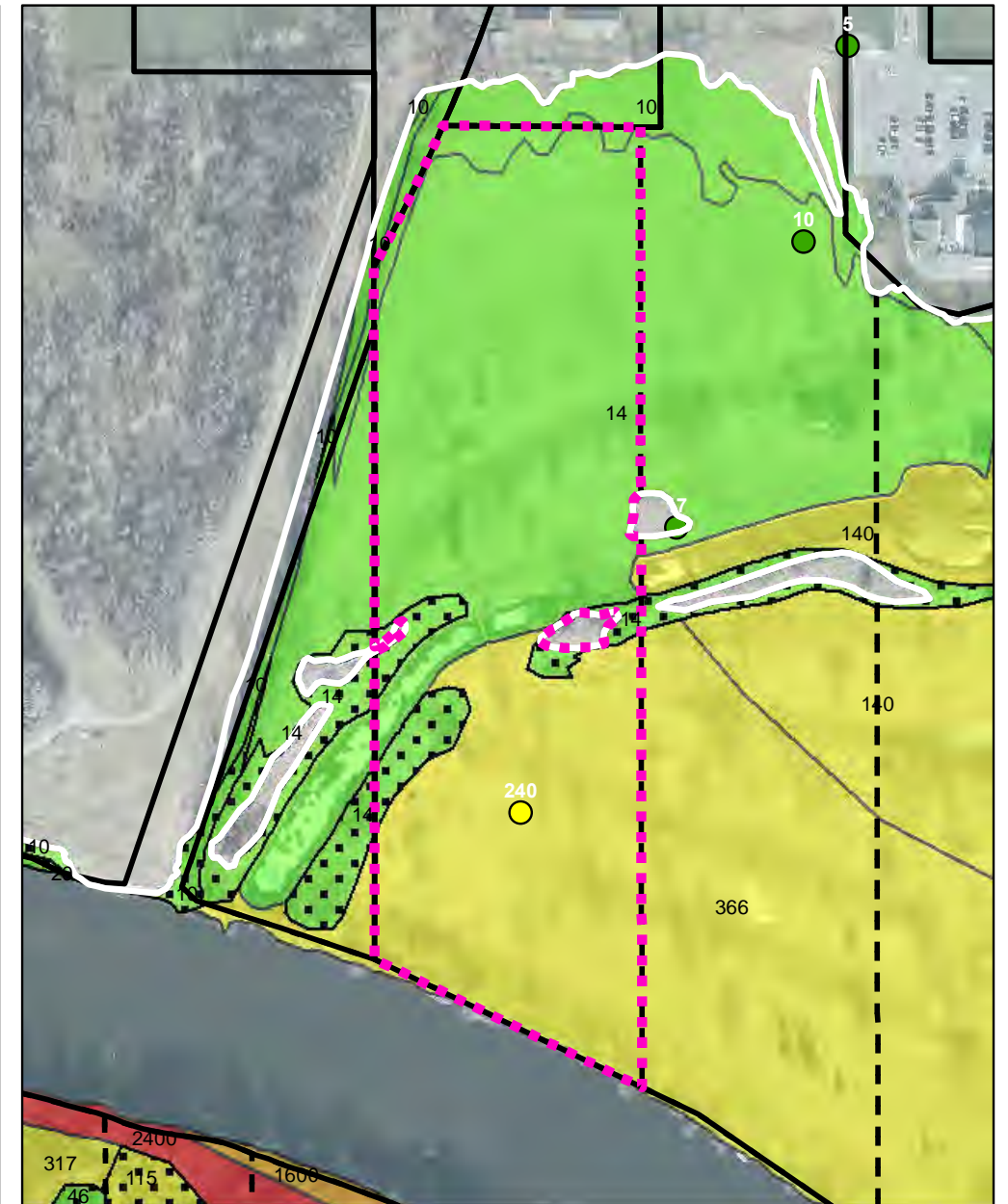
Aerial Background



Geomorphic Polygons



SAC Polygons and Existing Samples



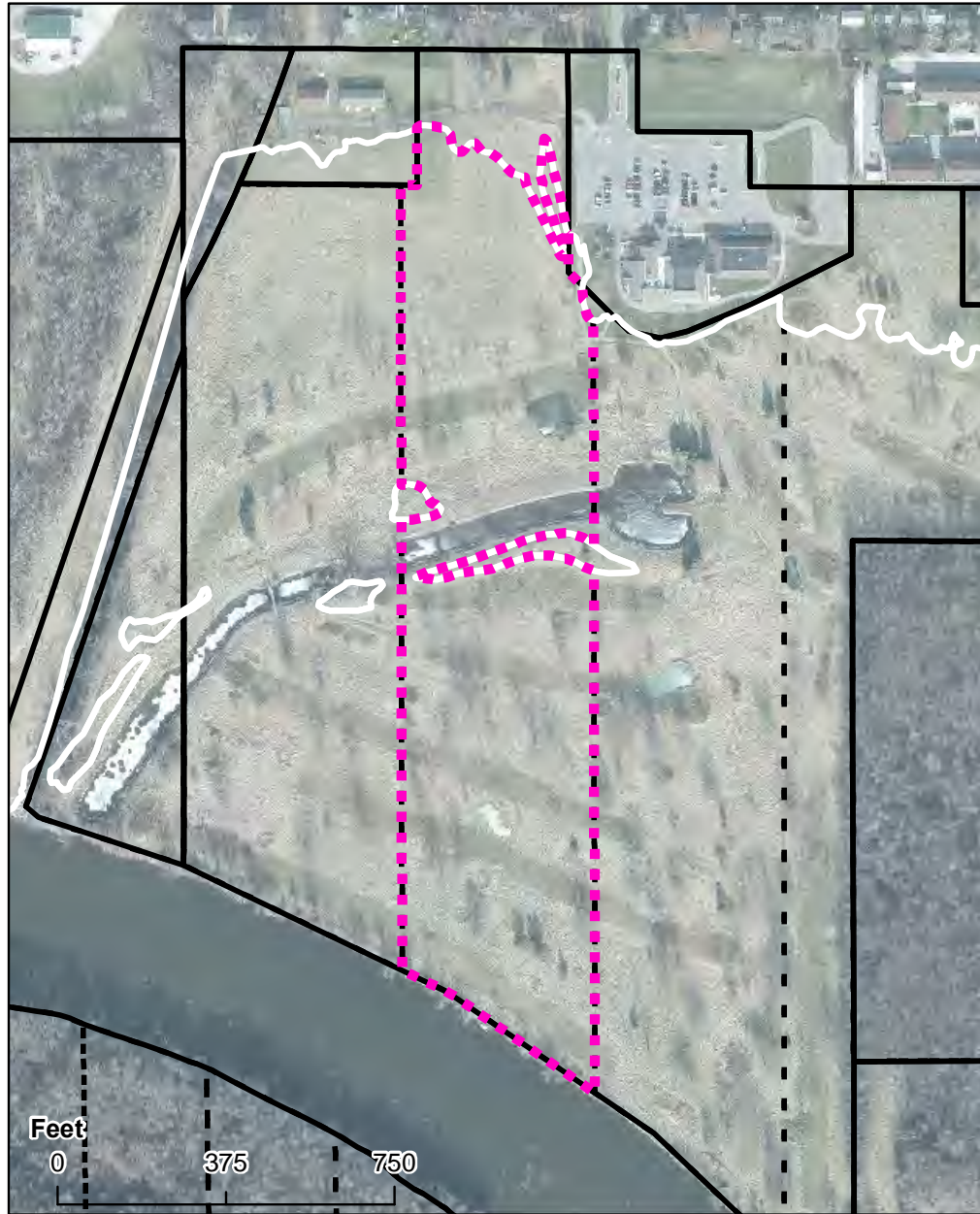
Area in 8-year Floodplain: 72.23 acres

Area of DU: 18.12 acres

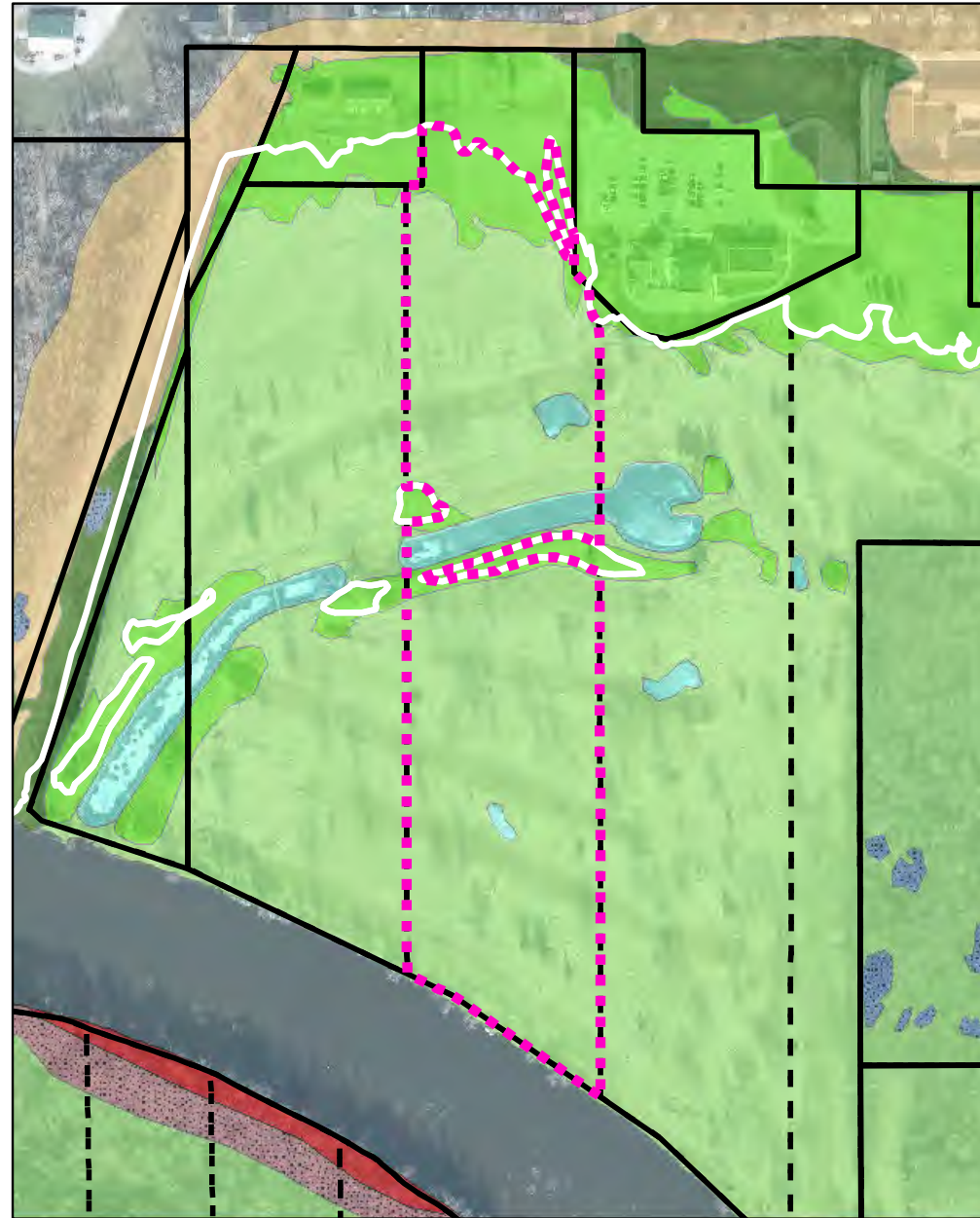
Rev 0 — July 27th, 2021

LAND USE VERIFIED

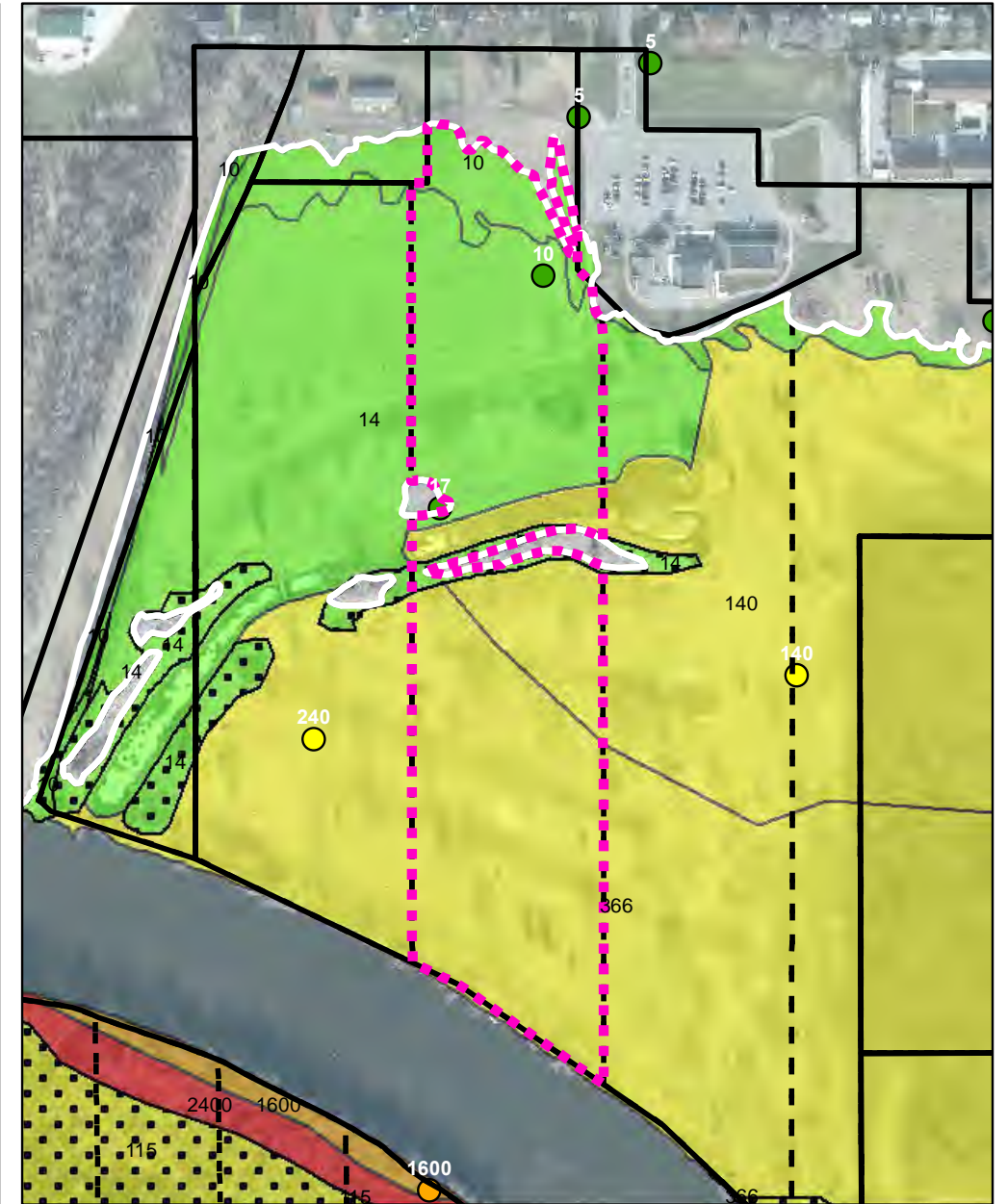
Aerial Background



Geomorphic Polygons



SAC Polygons and Existing Samples



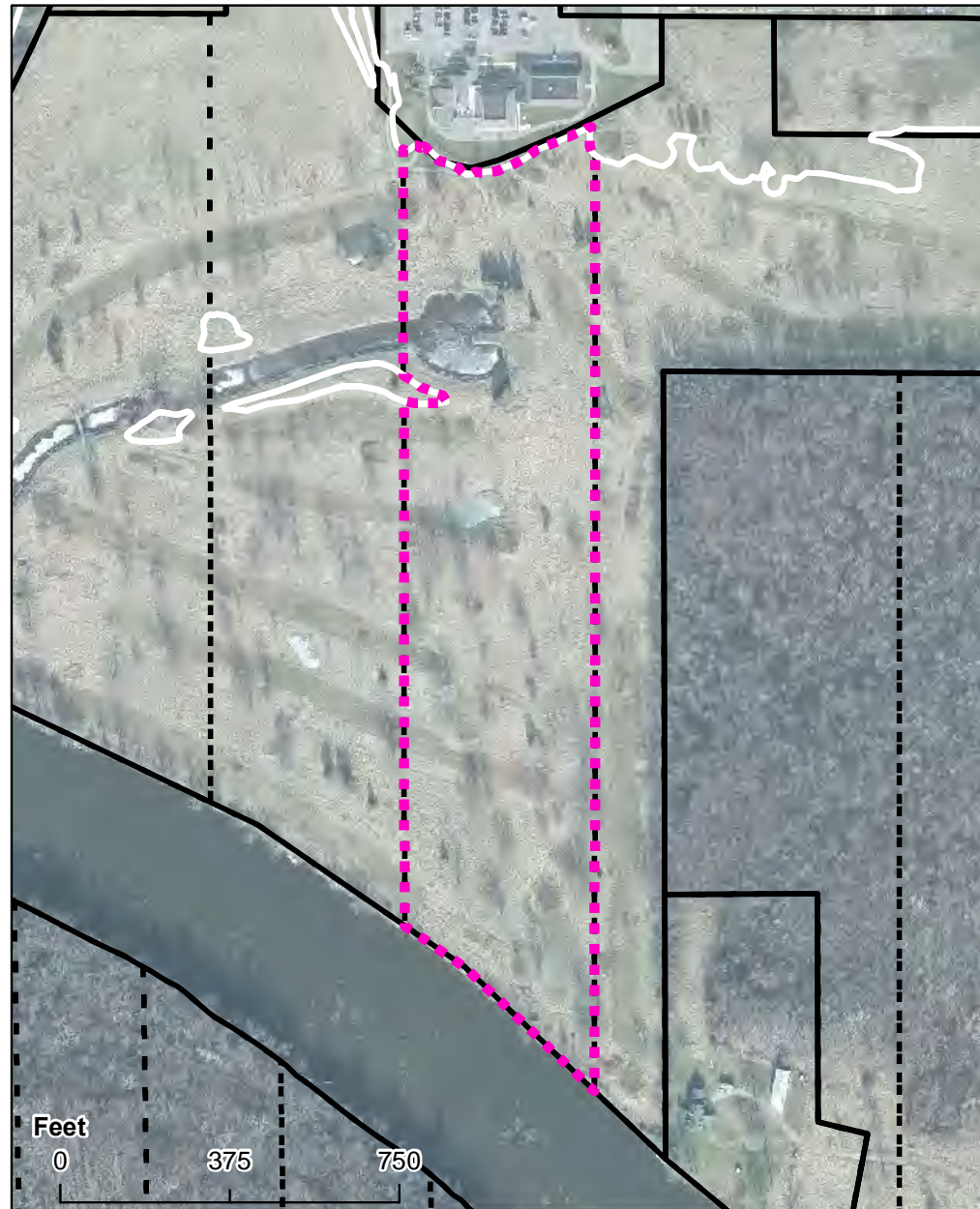
Area in 8-year Floodplain: 72.23 acres

Area of DU: 18.19 acres

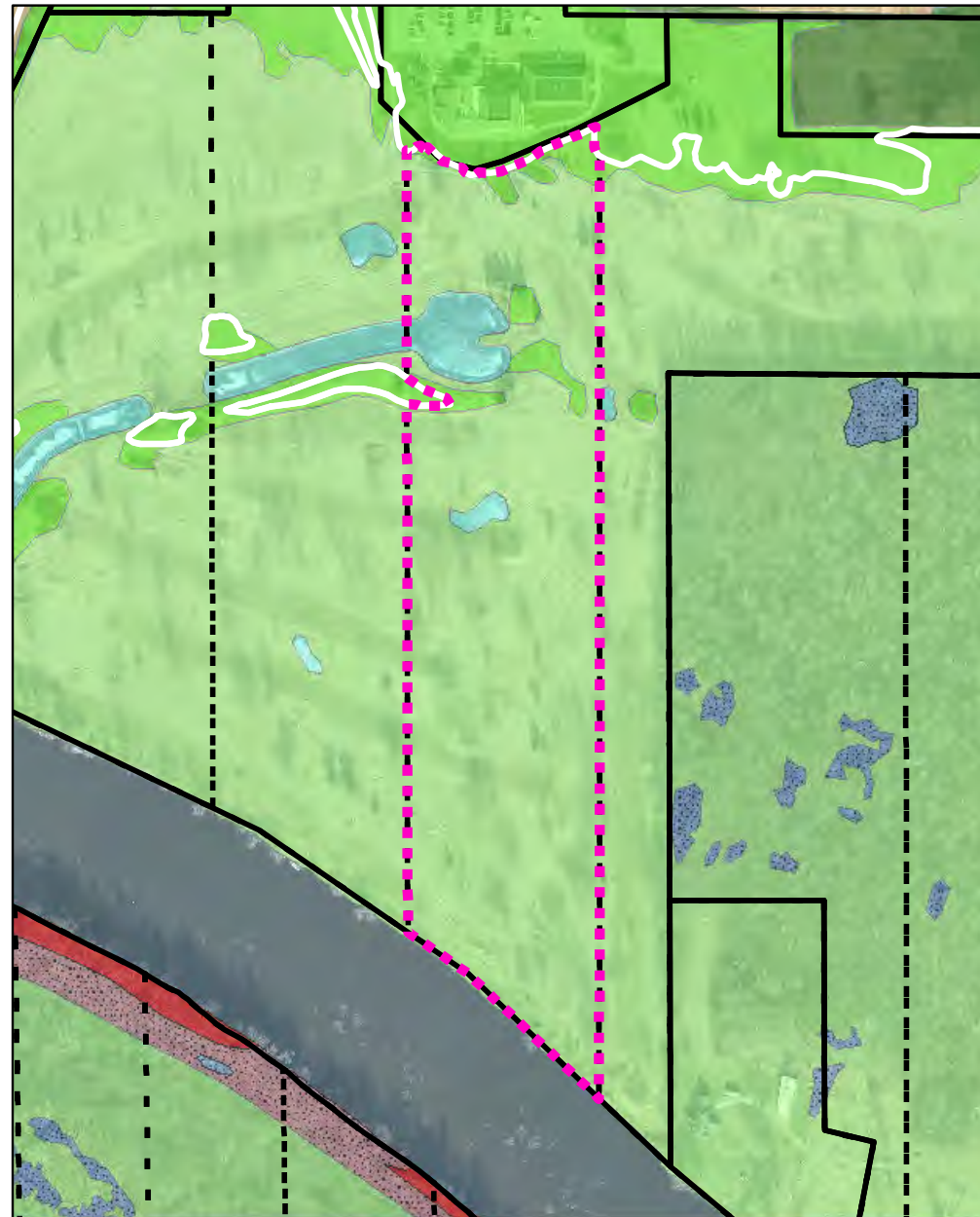
Rev 0 — July 27th, 2021

LAND USE VERIFIED

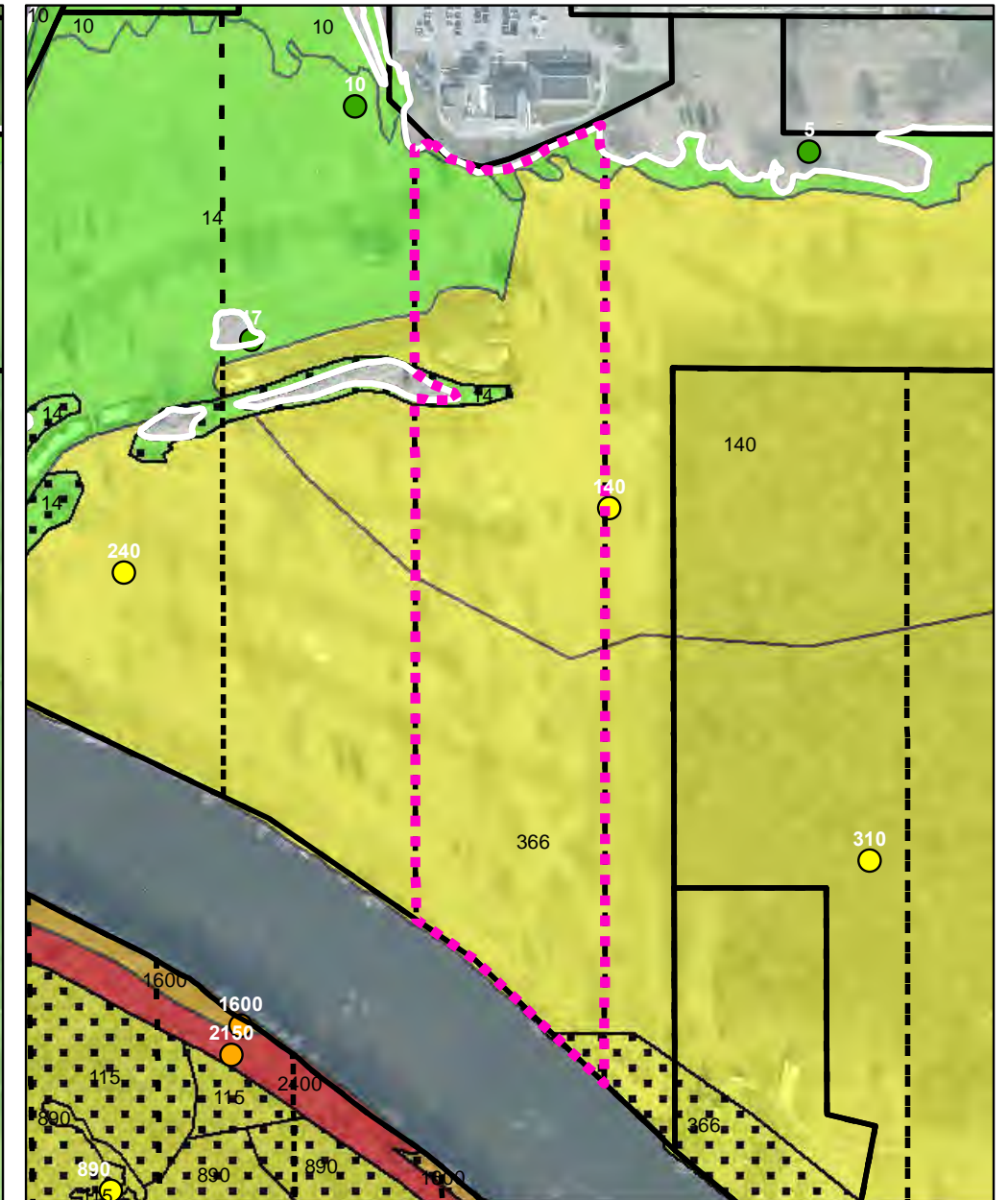
Aerial Background



Geomorphic Polygons



SAC Polygons and Existing Samples



Area in 8-year Floodplain: 69.08 acres

Area of DU: 17.23 acres

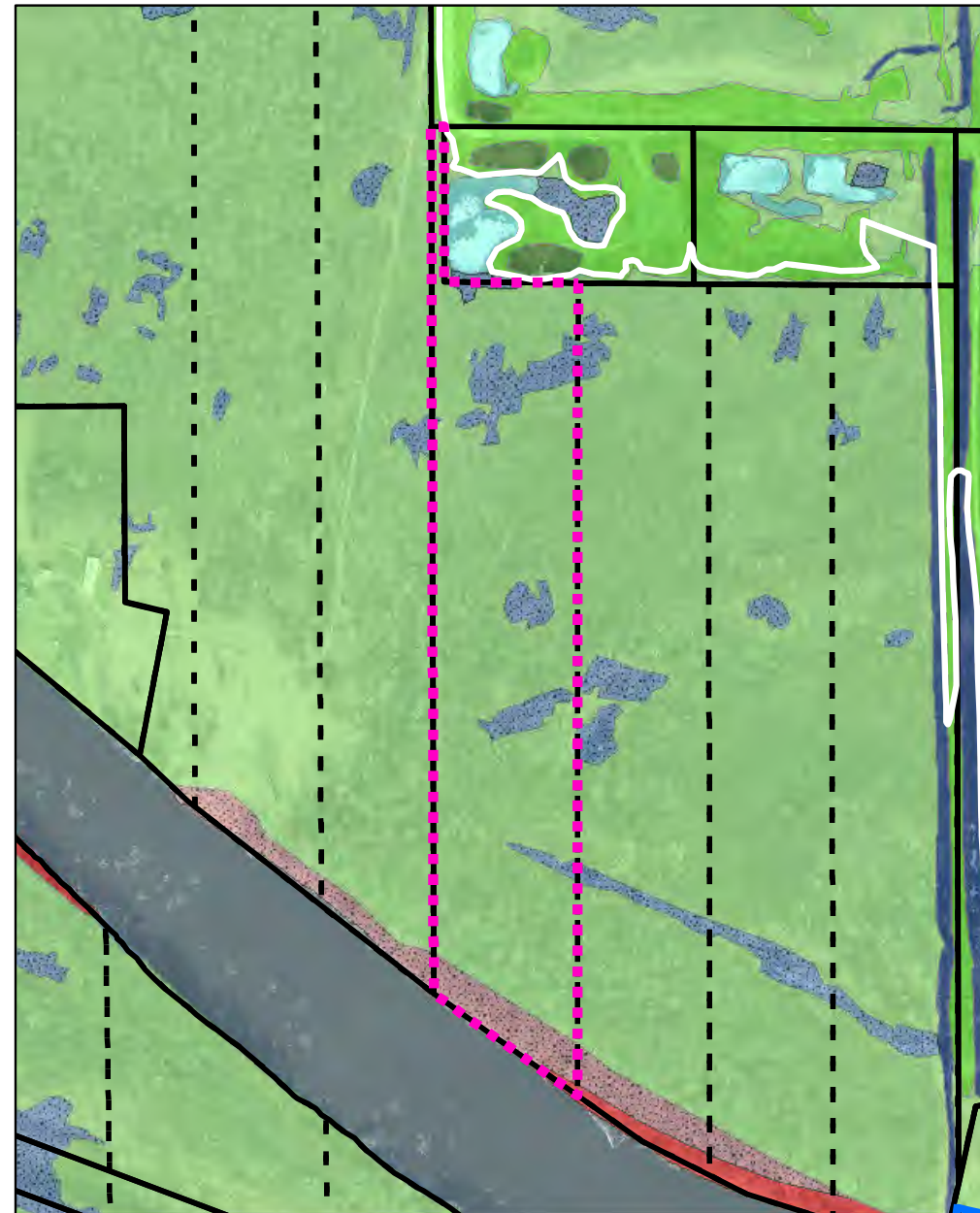
Rev 0 — July 27th, 2021

LAND USE VERIFIED

Aerial Background



Geomorphic Polygons



SAC Polygons and Existing Samples



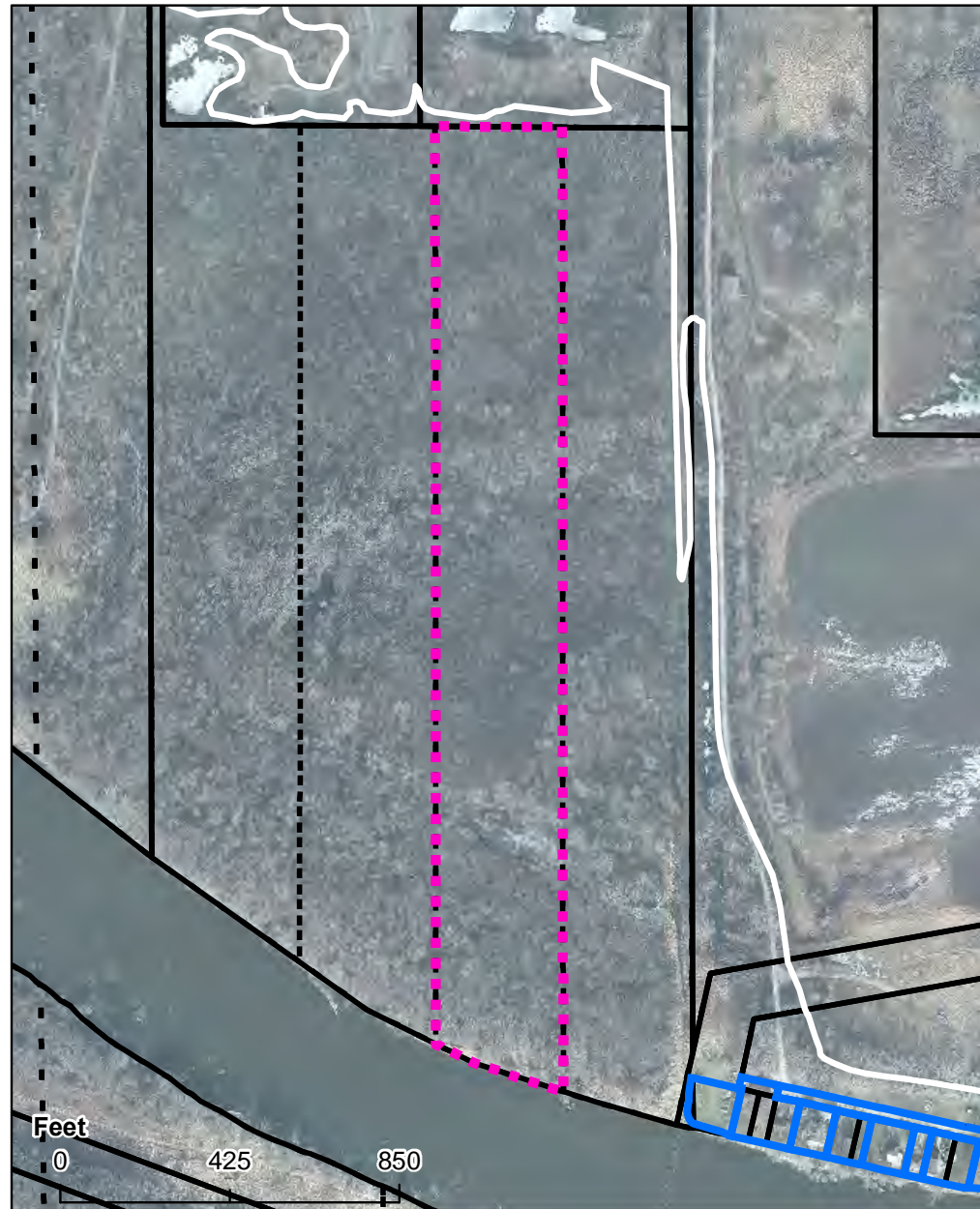
Area in 8-year Floodplain: 69.08 acres

Area of DU: 17.31 acres

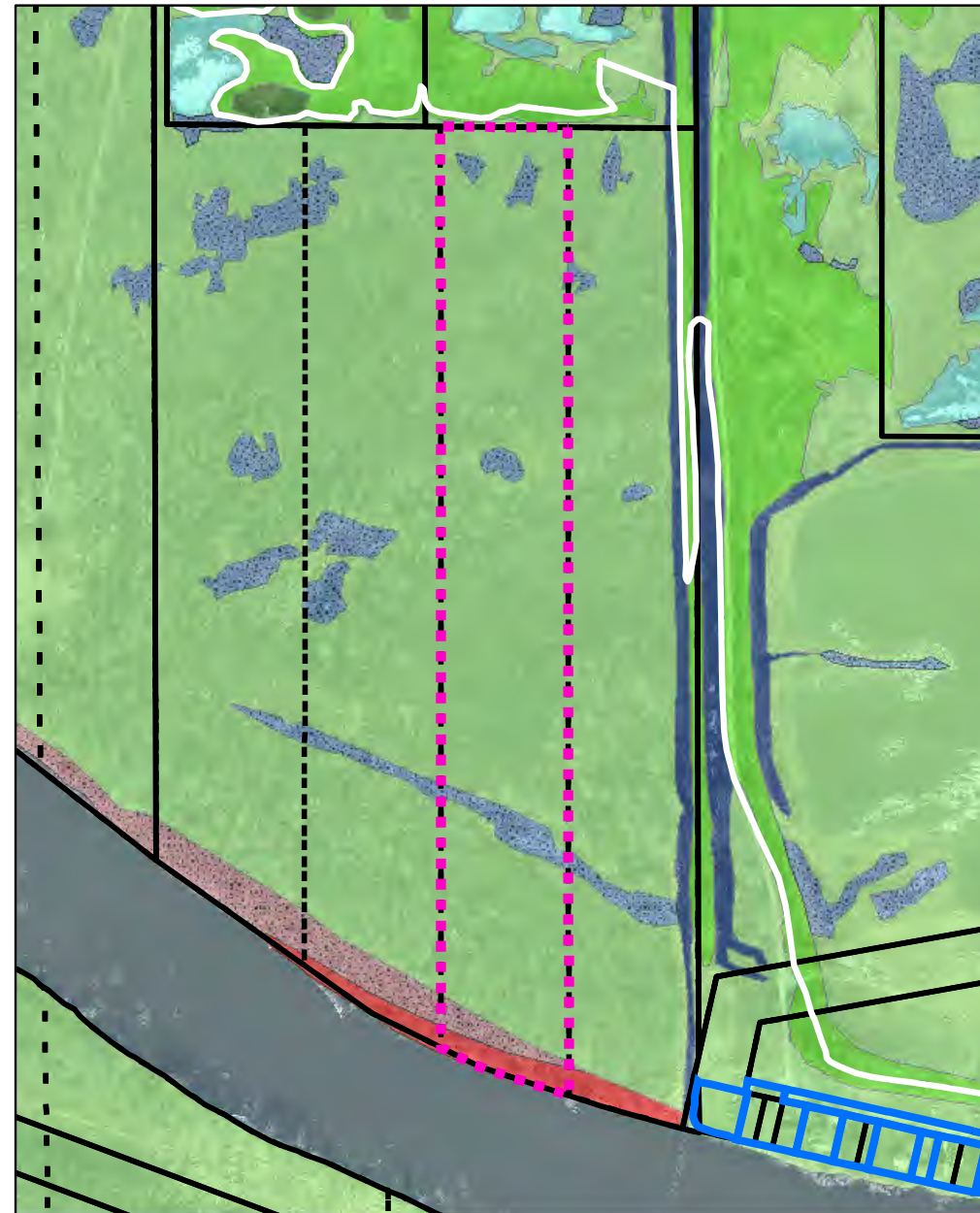
Rev 0 — July 27th, 2021

LAND USE VERIFIED

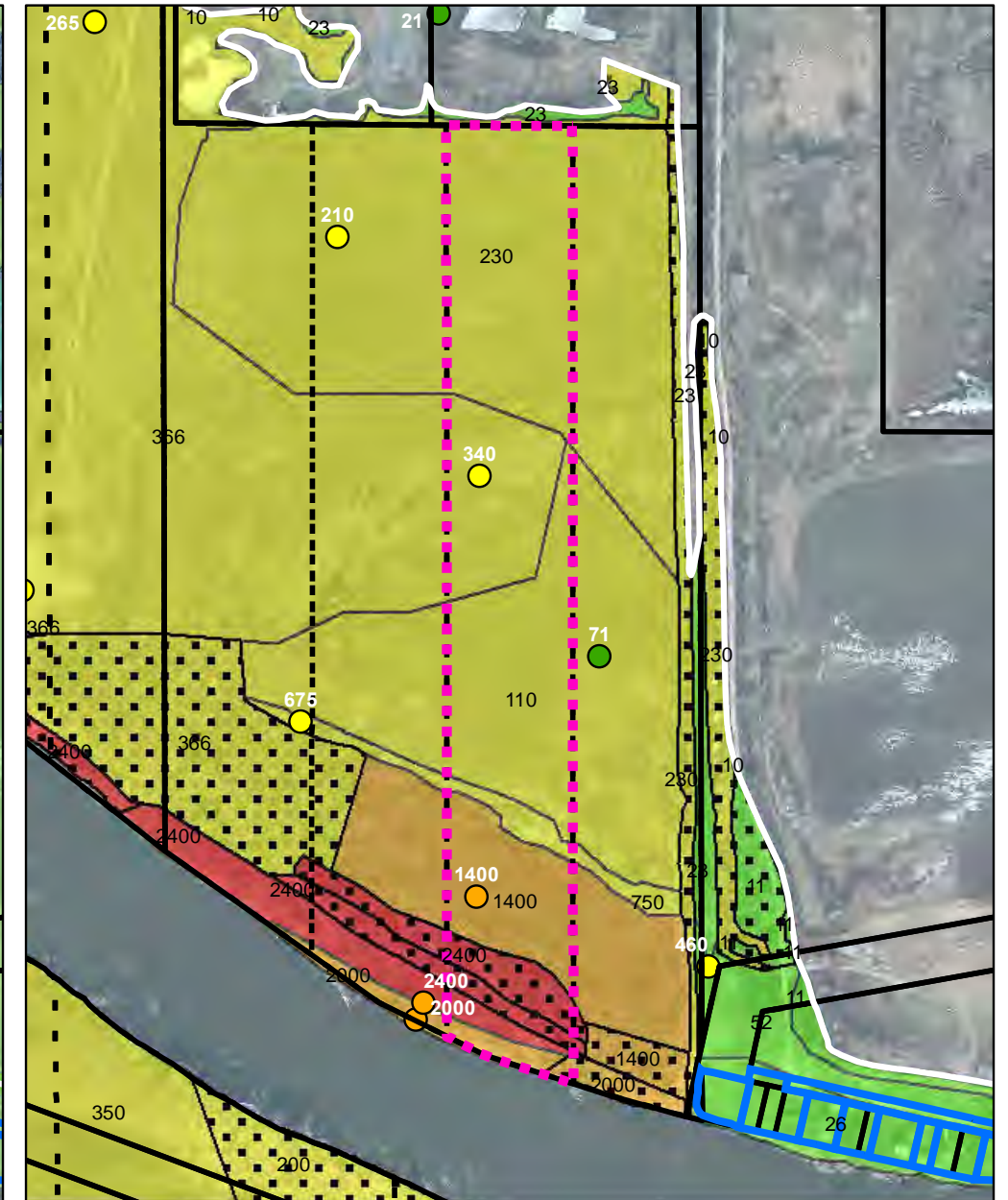
Aerial Background



Geomorphic Polygons



SAC Polygons and Existing Samples



Decision Unit ID – S7_056_DU03
Tittabawassee River Floodplain Post-Removal Site Control Plan
Appendix B

Figure
S7_056_3

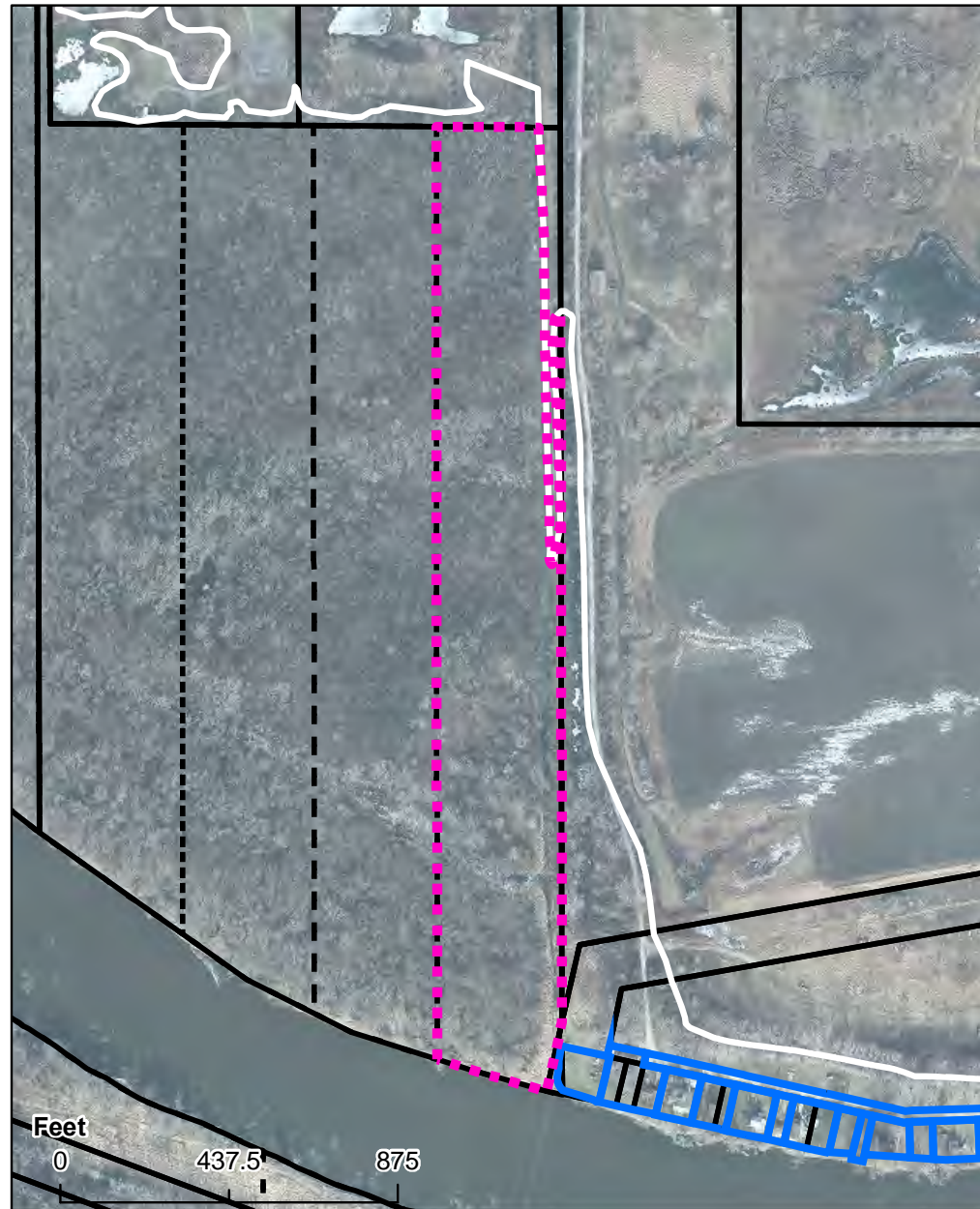
Area in 8-year Floodplain: 69.08 acres

Area of DU: 17.30 acres

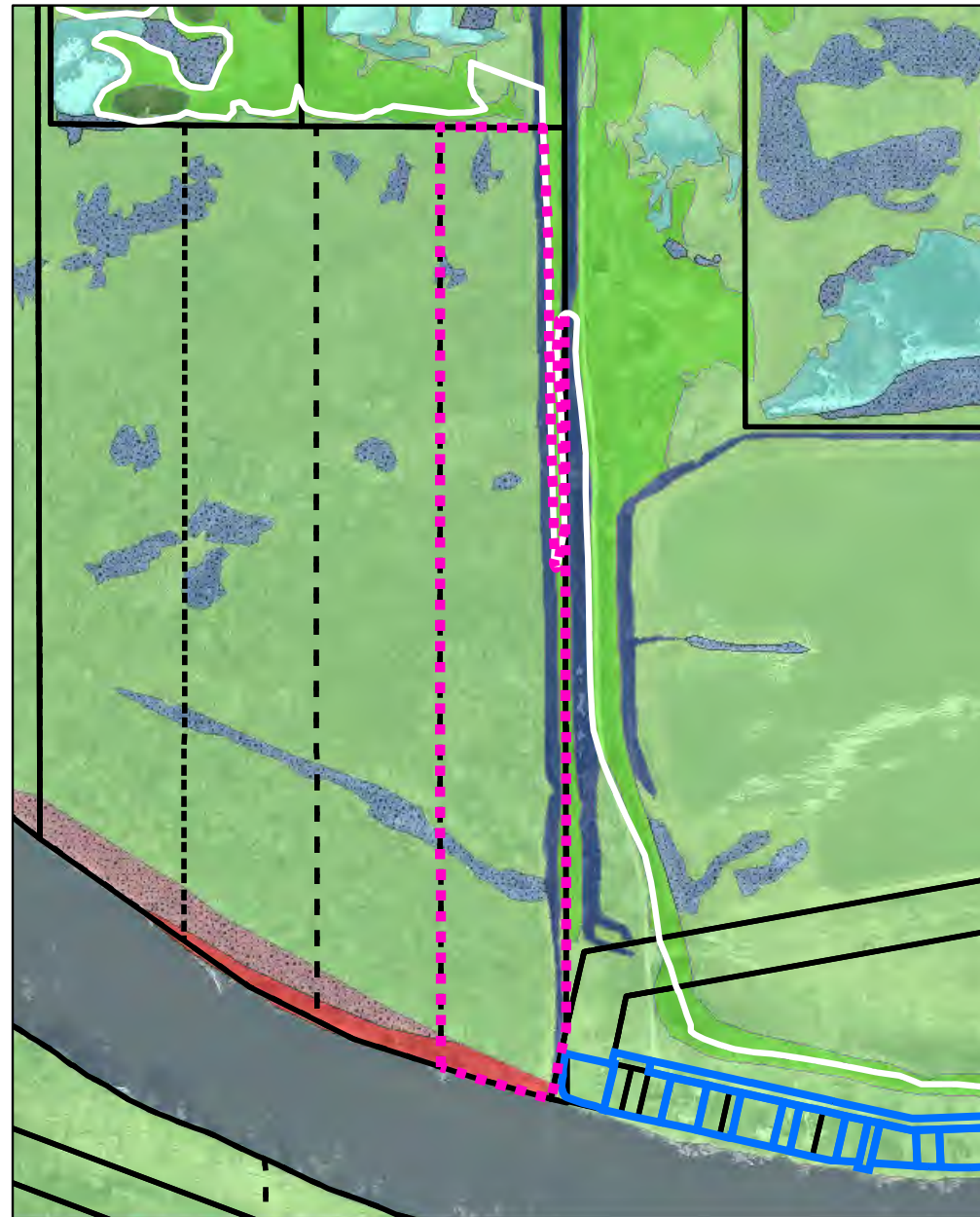
Rev 0 — July 27th, 2021

LAND USE VERIFIED

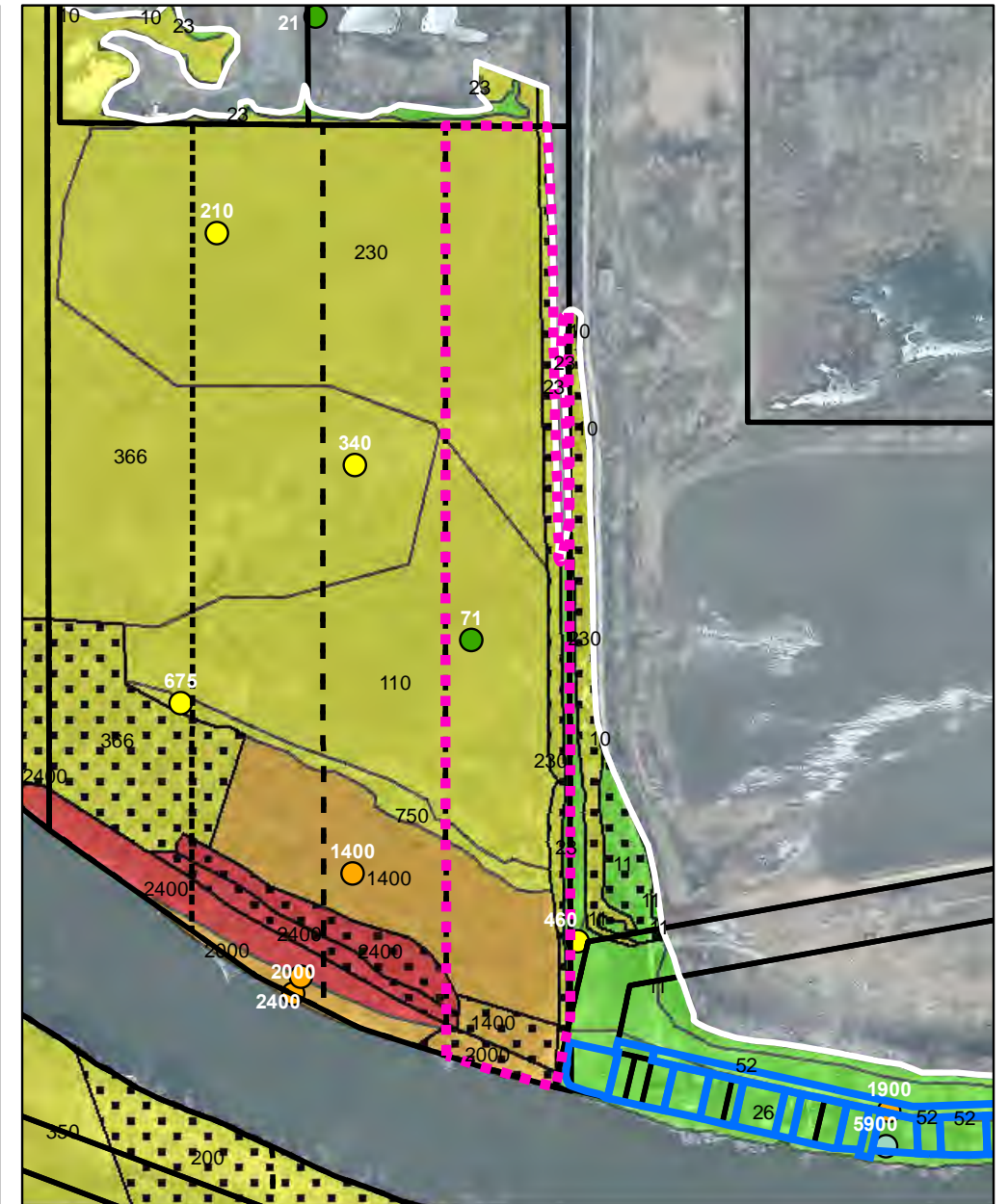
Aerial Background



Geomorphic Polygons



SAC Polygons and Existing Samples



Decision Unit ID – S7_056_DU04
Tittabawassee River Floodplain Post-Removal Site Control Plan
Appendix B

Figure
S7_056_4

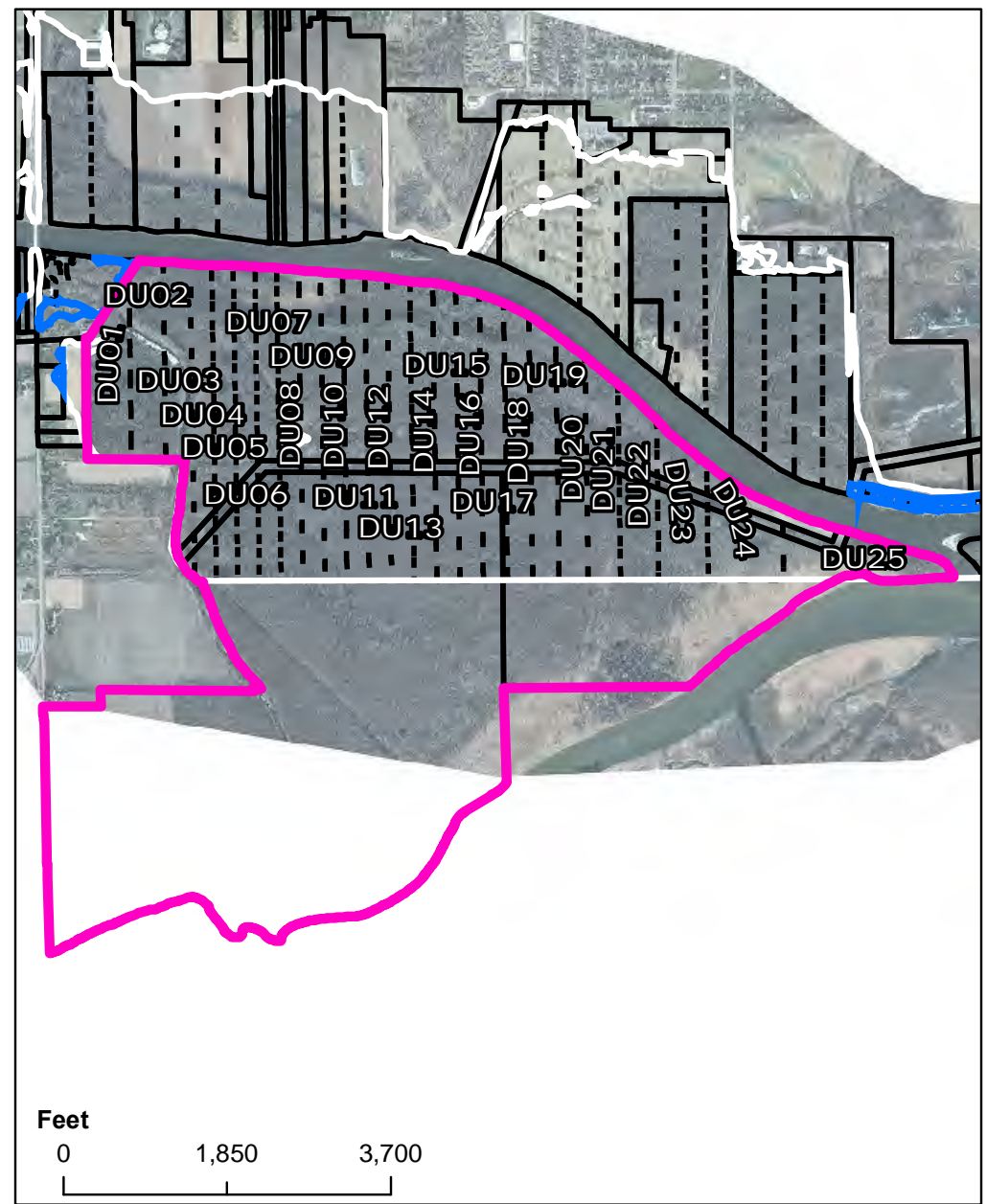
Area in 8-year Floodplain: 499.24 acres

Area of Maintained Land in 8-Year Floodplain: 0.00 acres
Area of Other Land in 8-Year Floodplain (DU01 through DU25): 499.24 acres

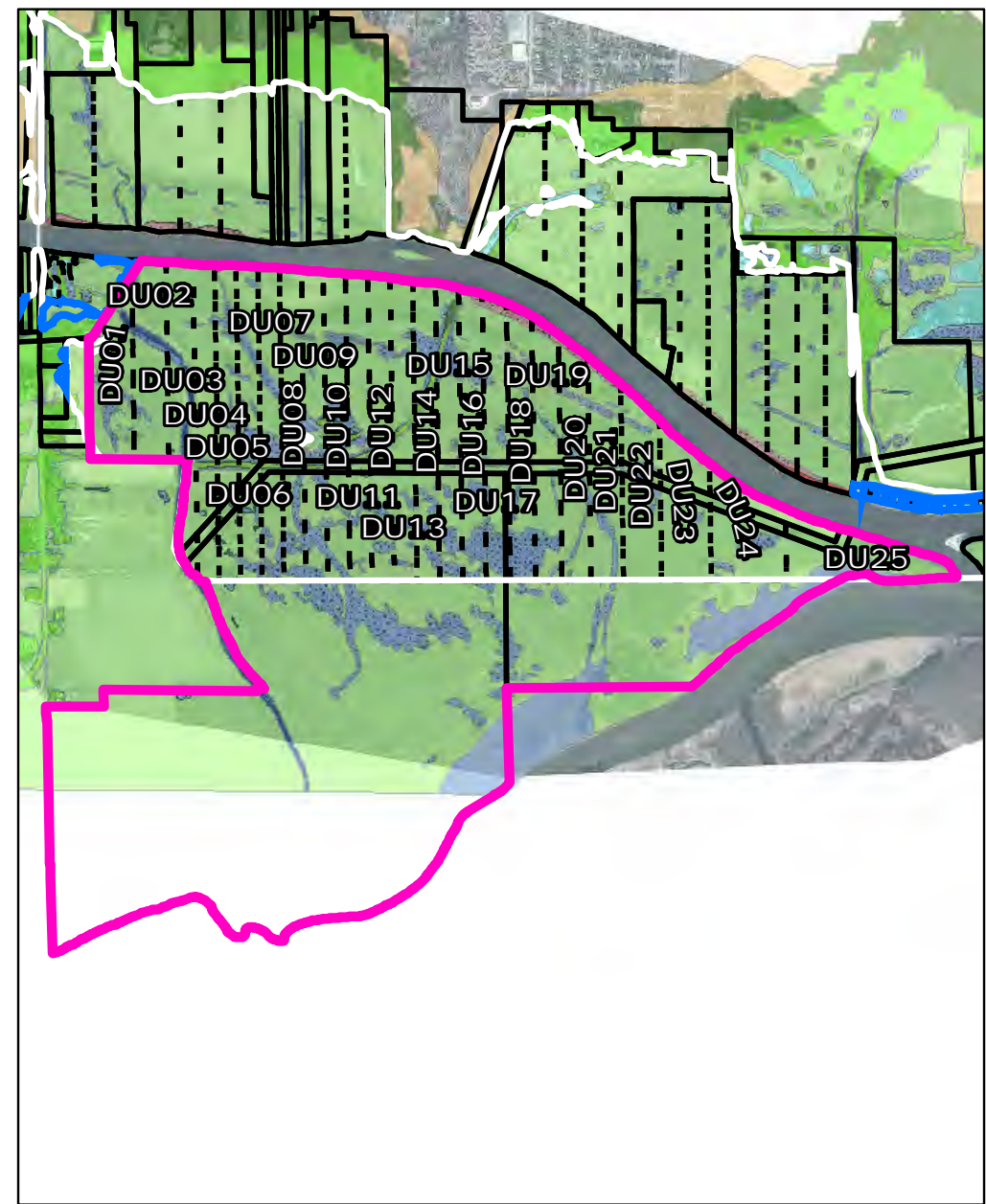
Rev 0 — July 27th, 2021

LAND USE VERIFIED

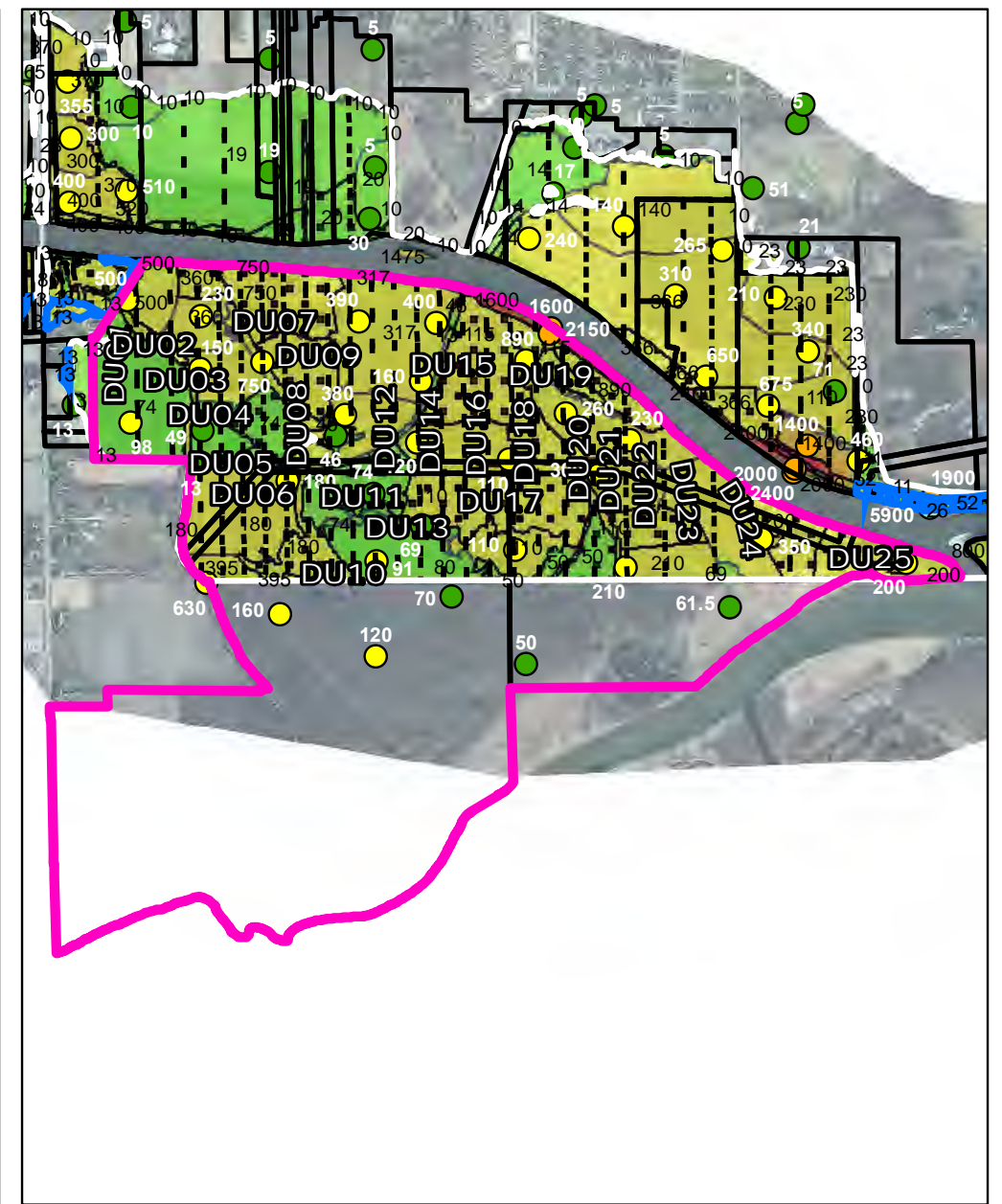
Aerial Background



Geomorphic Polygons



SAC Polygons and Existing Samples



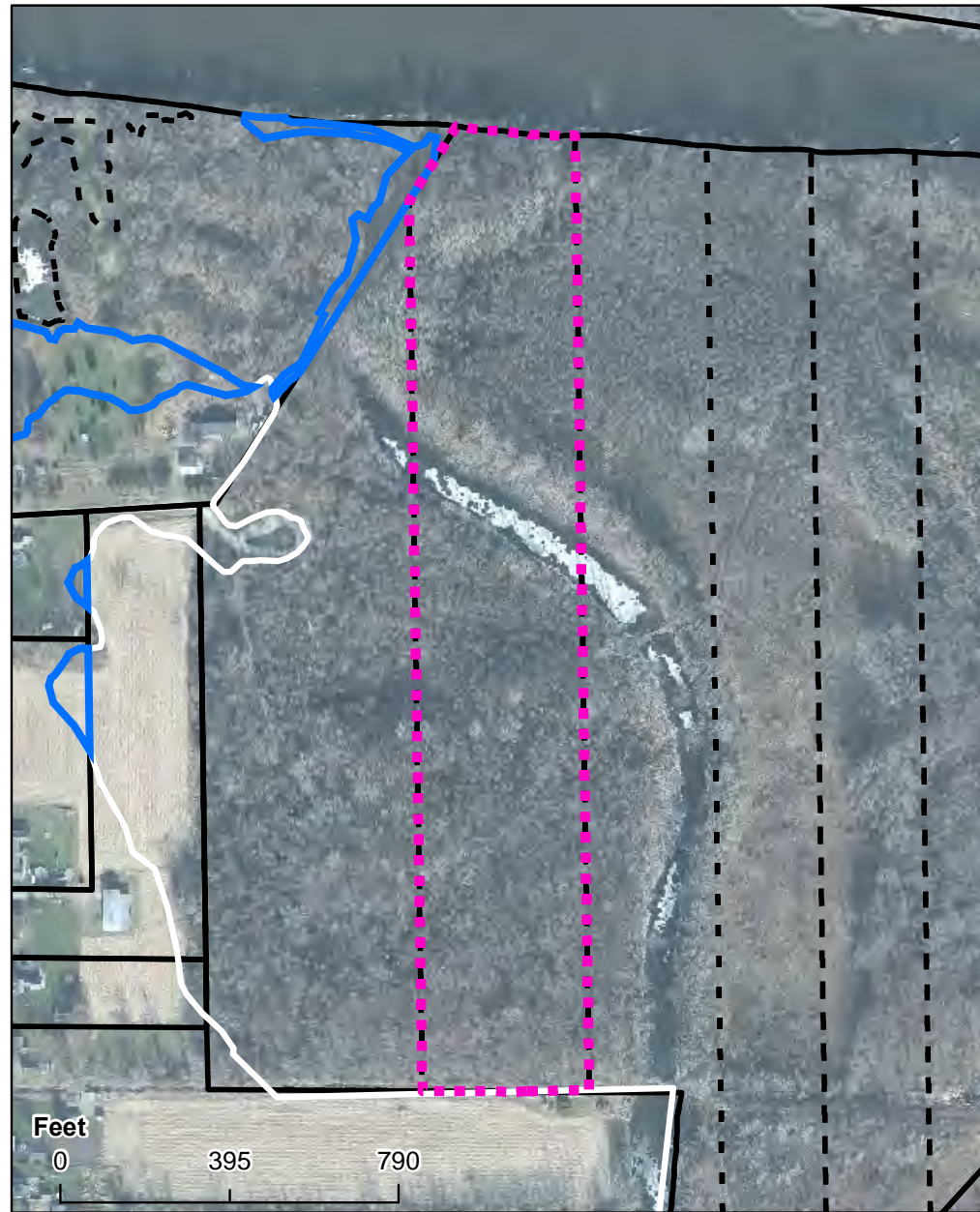
Area in 8-year Floodplain: 499.24 acres

Area of DU: 19.88 acres

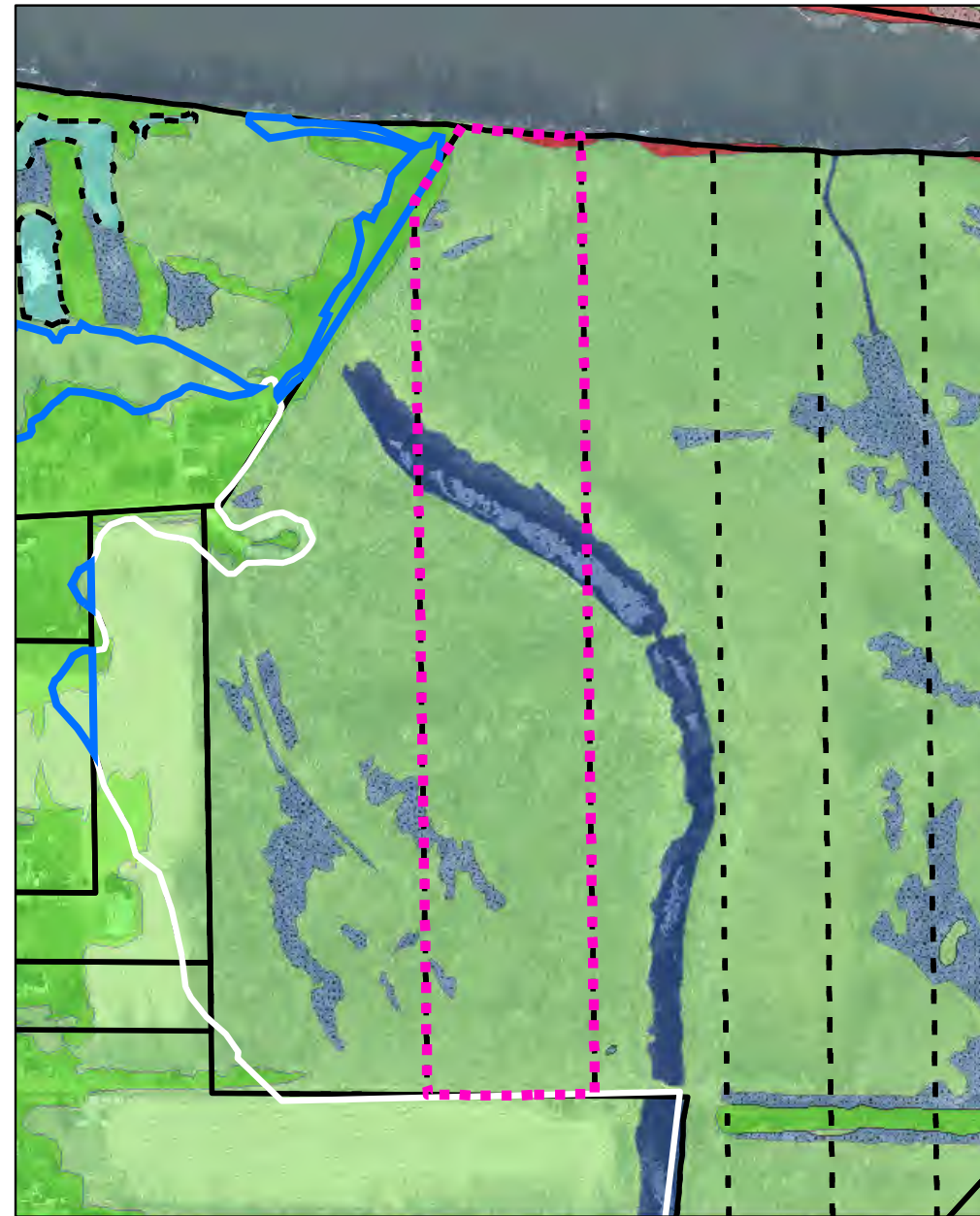
Rev 0 — July 27th, 2021

LAND USE VERIFIED

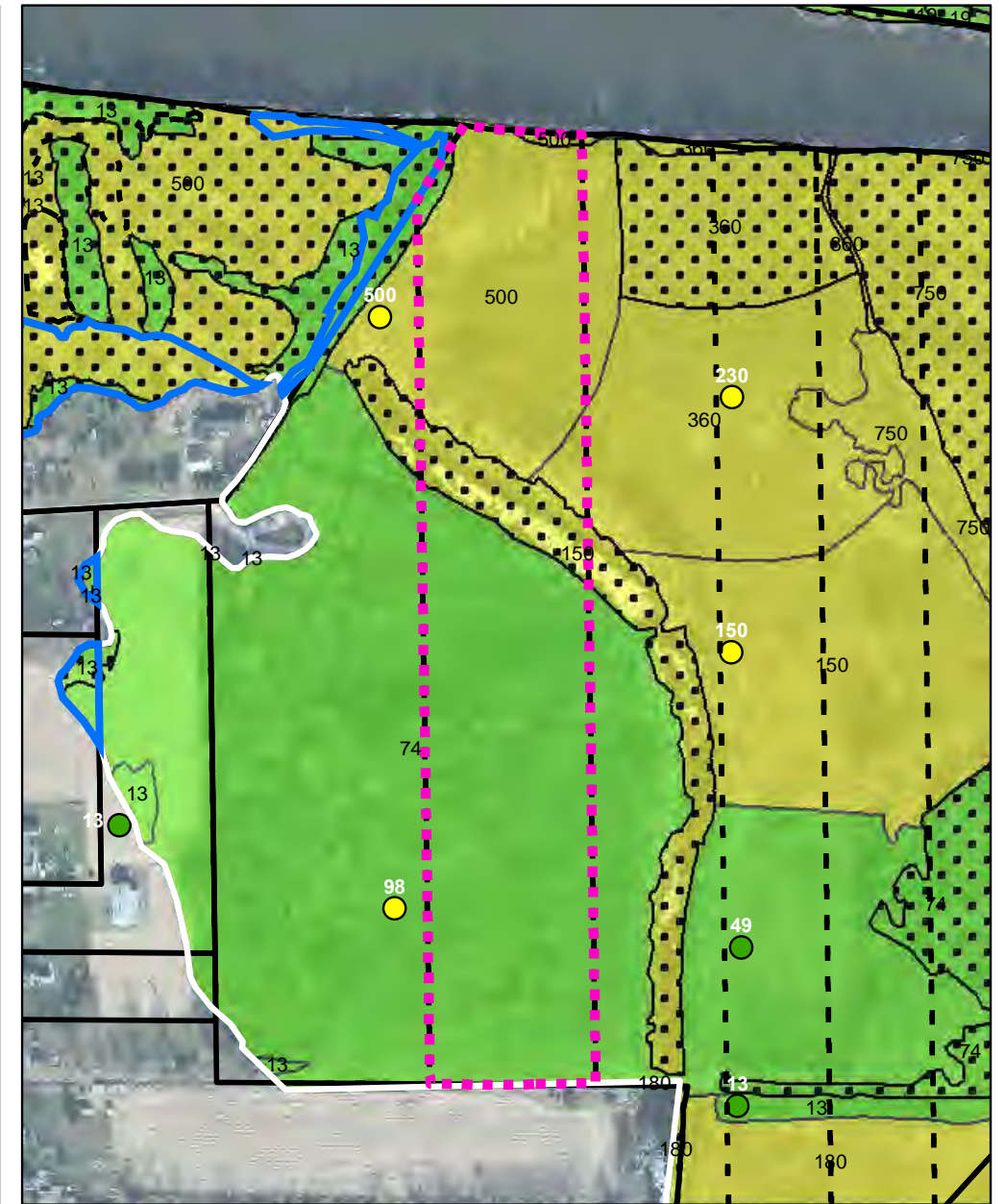
Aerial Background



Geomorphic Polygons



SAC Polygons and Existing Samples



Decision Unit ID – S7_120-123_DU02
Tittabawassee River Floodplain Post-Removal Site Control Plan
Appendix B

Figure
S7_120-
123_2

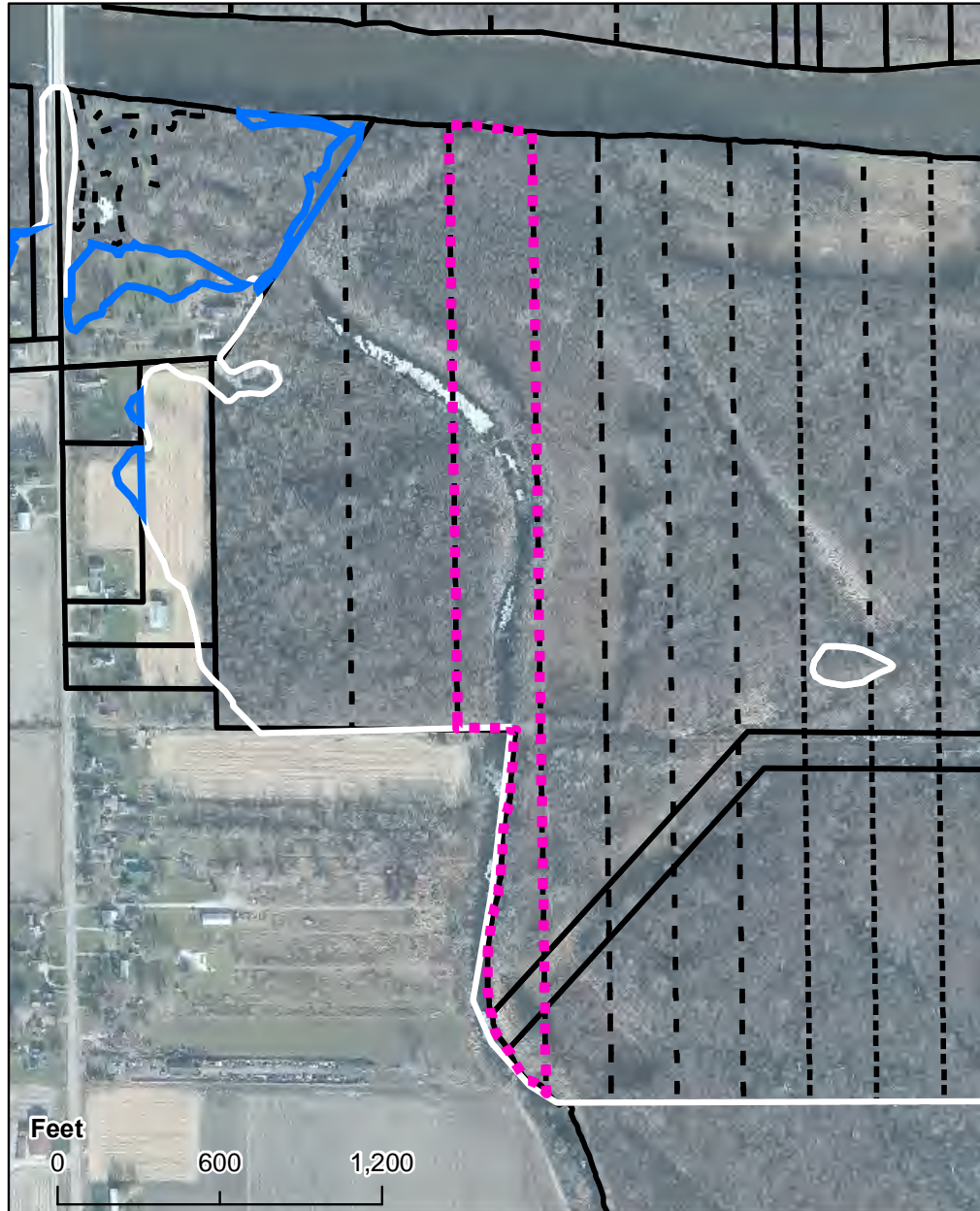
Area in 8-year Floodplain: 499.24 acres

Area of DU: 20.35 acres

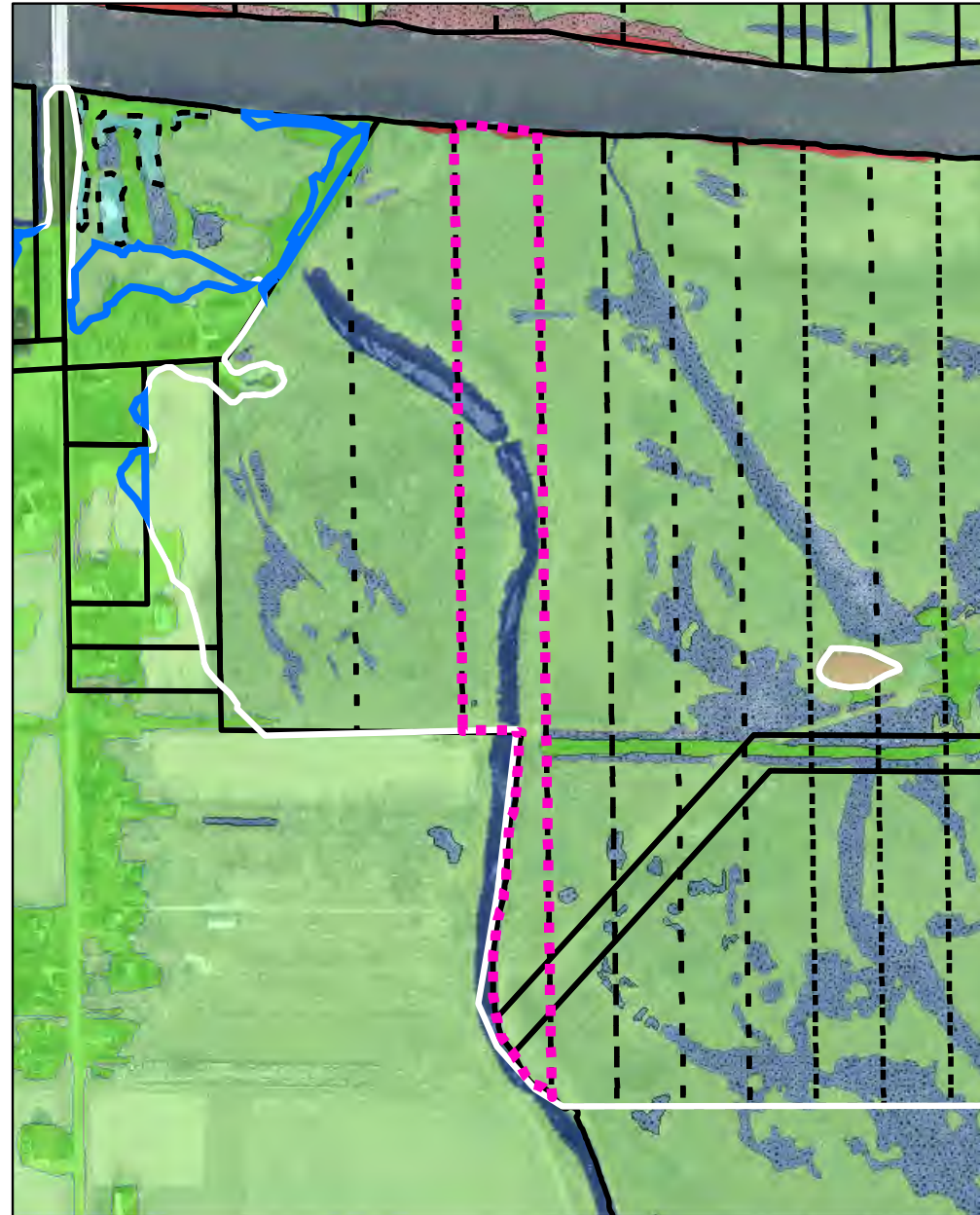
Rev 0 — July 27th, 2021

LAND USE VERIFIED

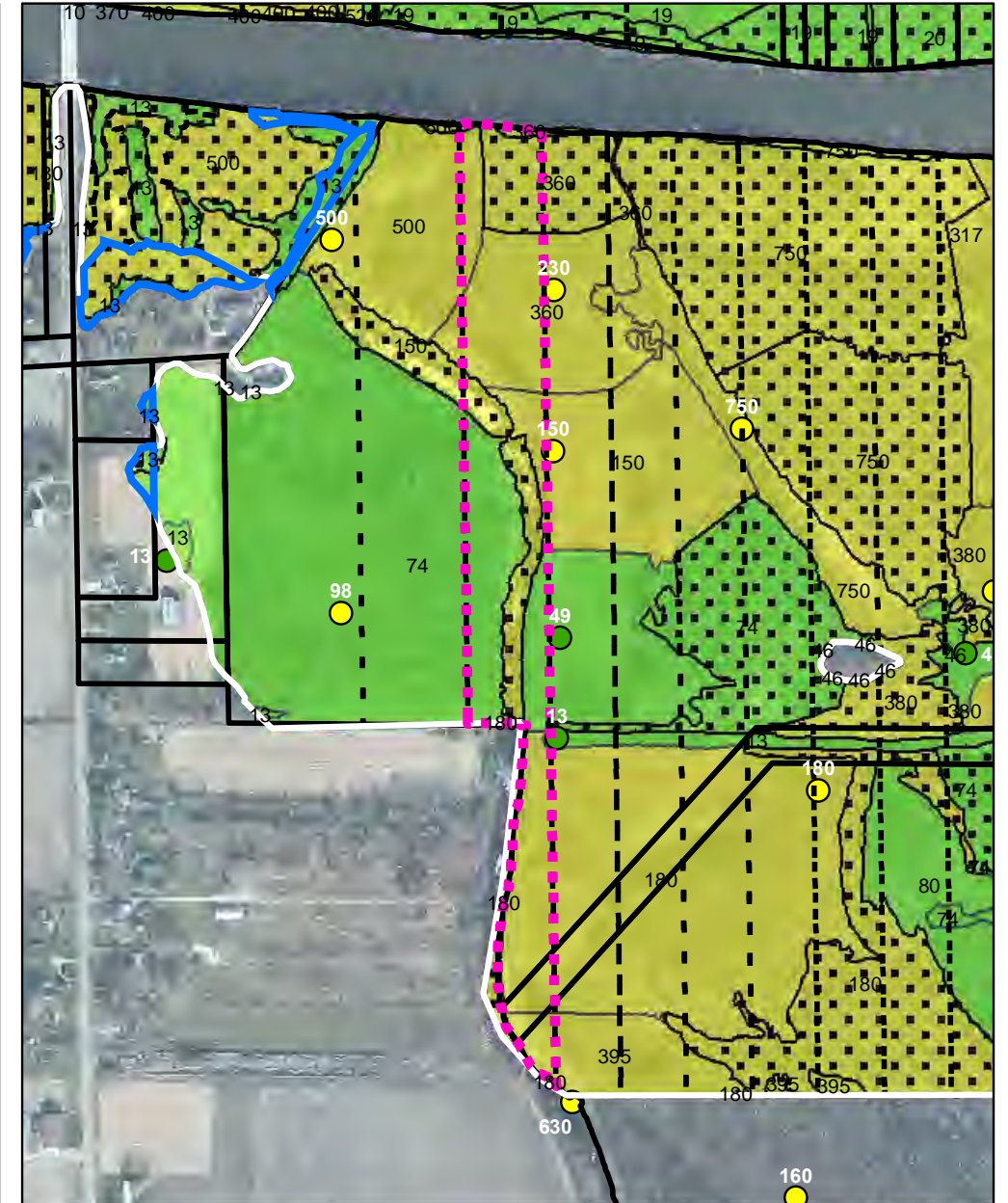
Aerial Background



Geomorphic Polygons



SAC Polygons and Existing Samples



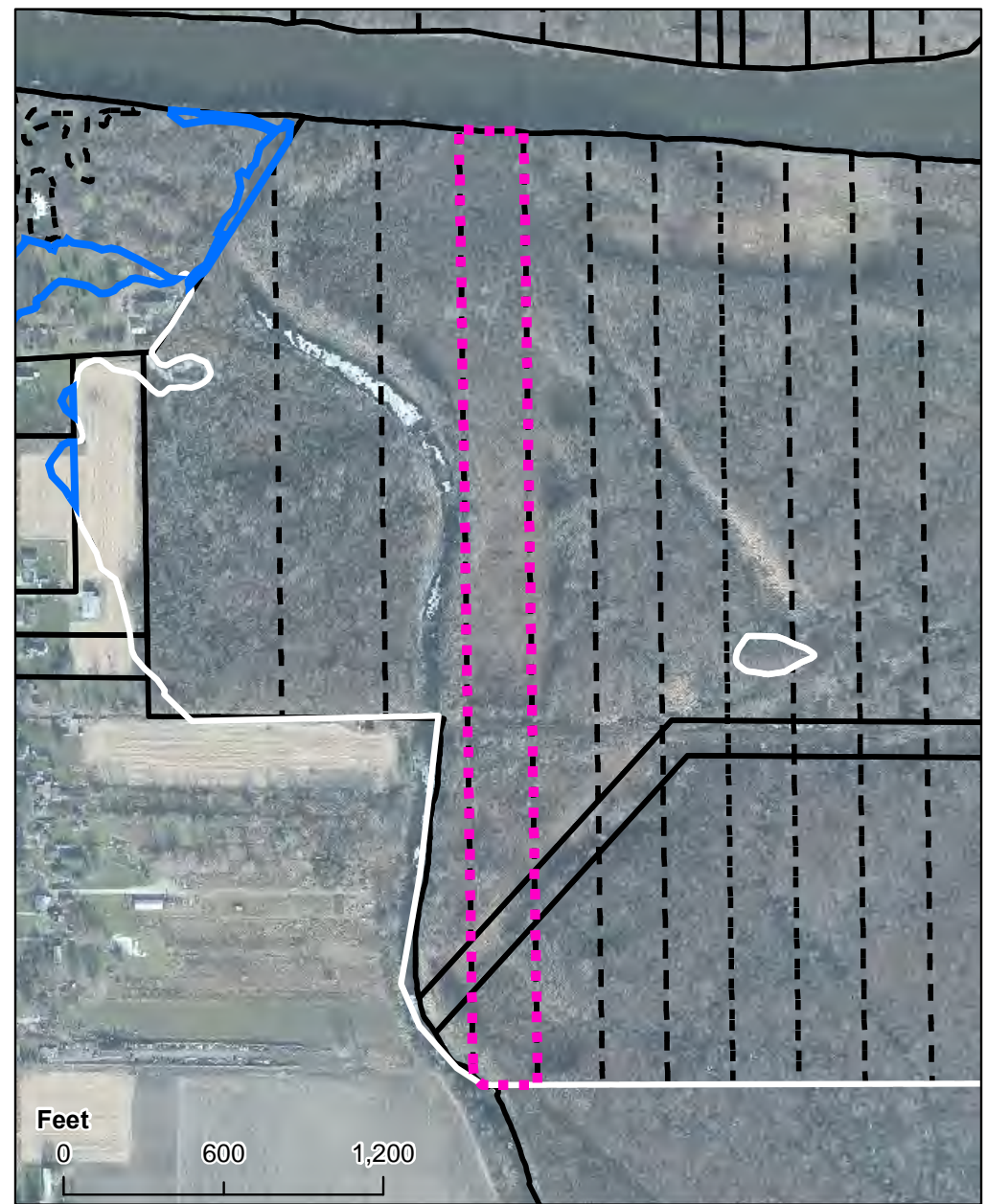
Area in 8-year Floodplain: 499.24 acres

Area of DU: 19.92 acres

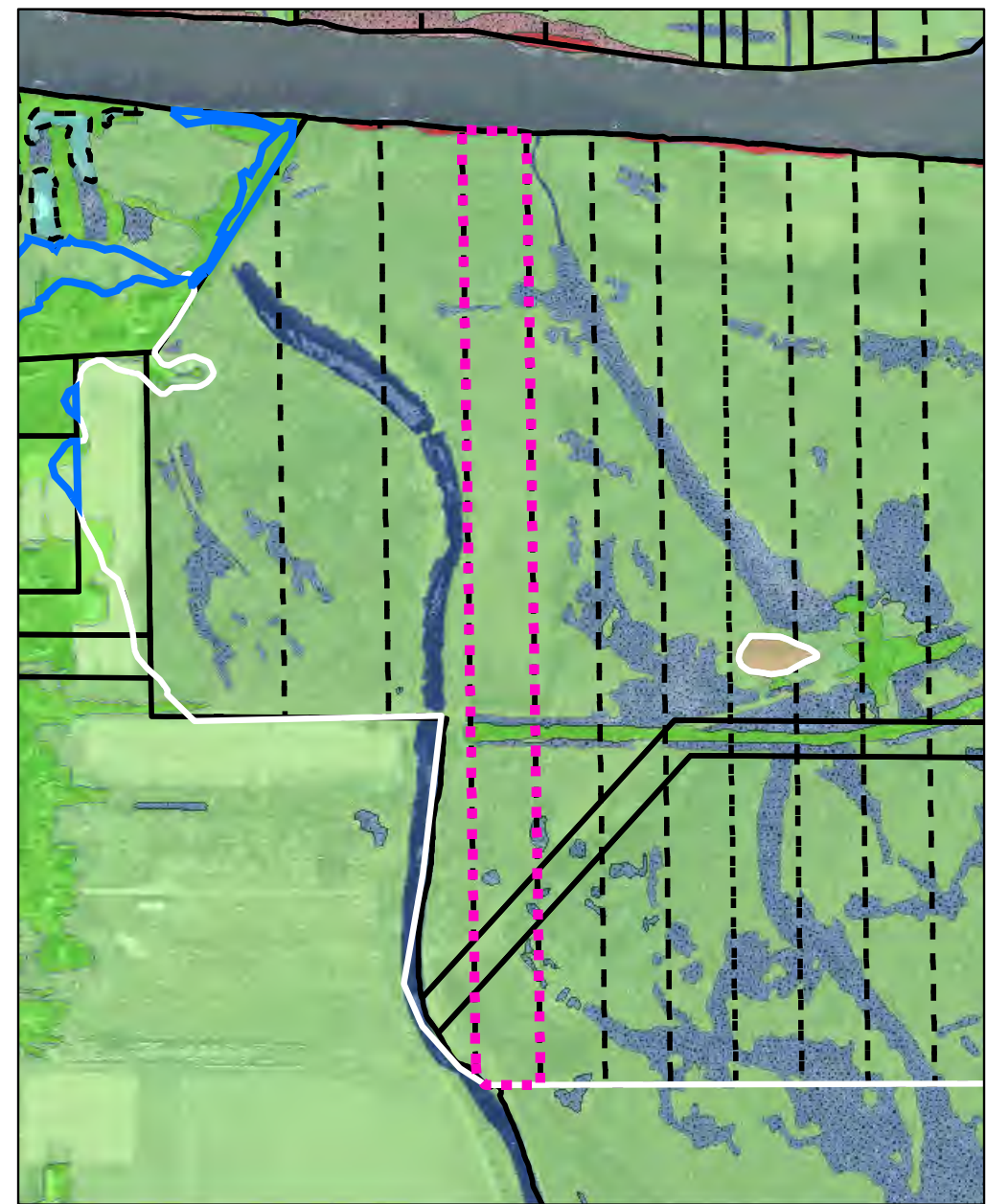
Rev 0 — July 27th, 2021

LAND USE VERIFIED

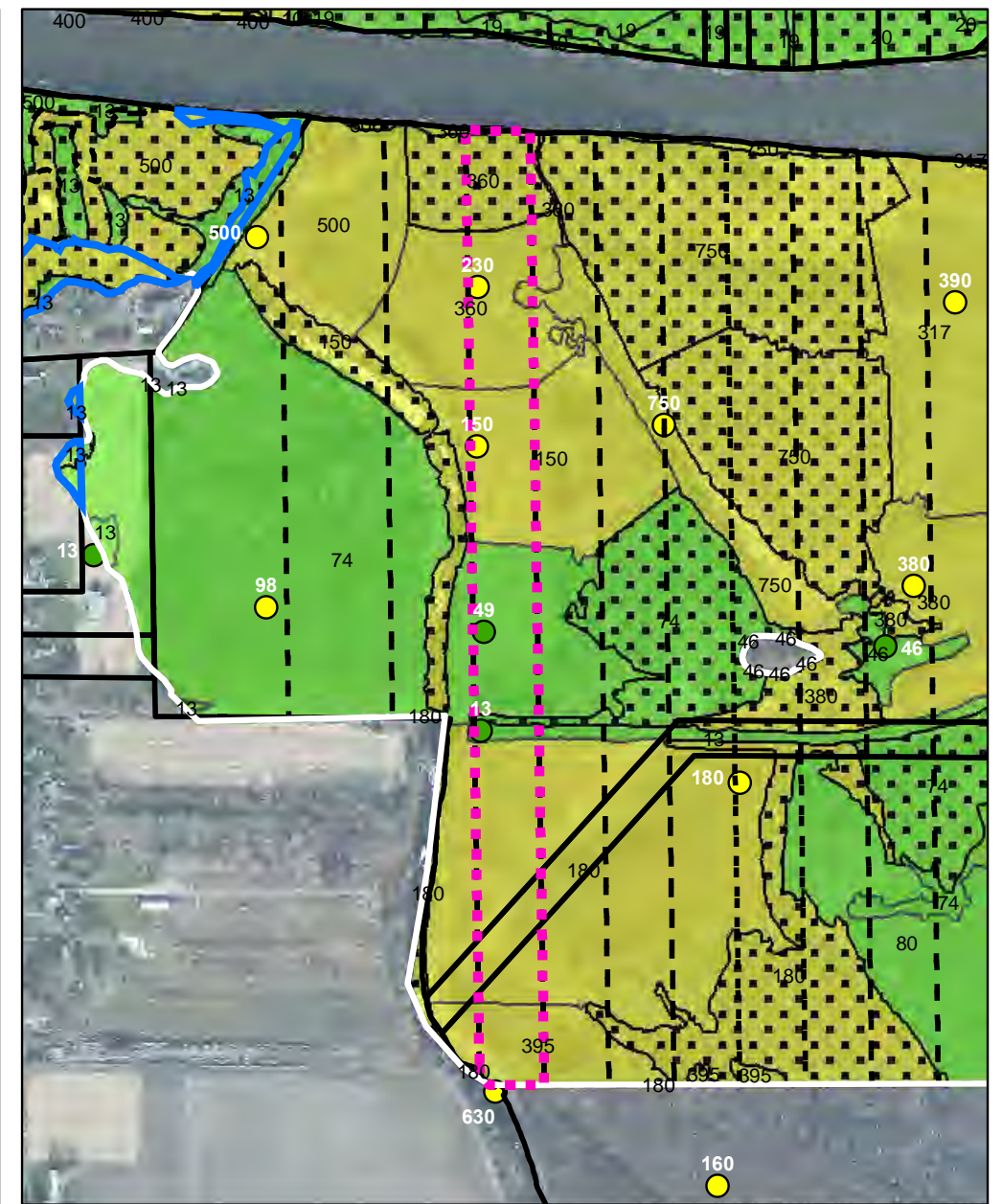
Aerial Background



Geomorphic Polygons



SAC Polygons and Existing Samples



Decision Unit ID – S7_120-123_DU04
Tittabawassee River Floodplain Post-Removal Site Control Plan
Appendix B

Figure
S7_120-
123_4

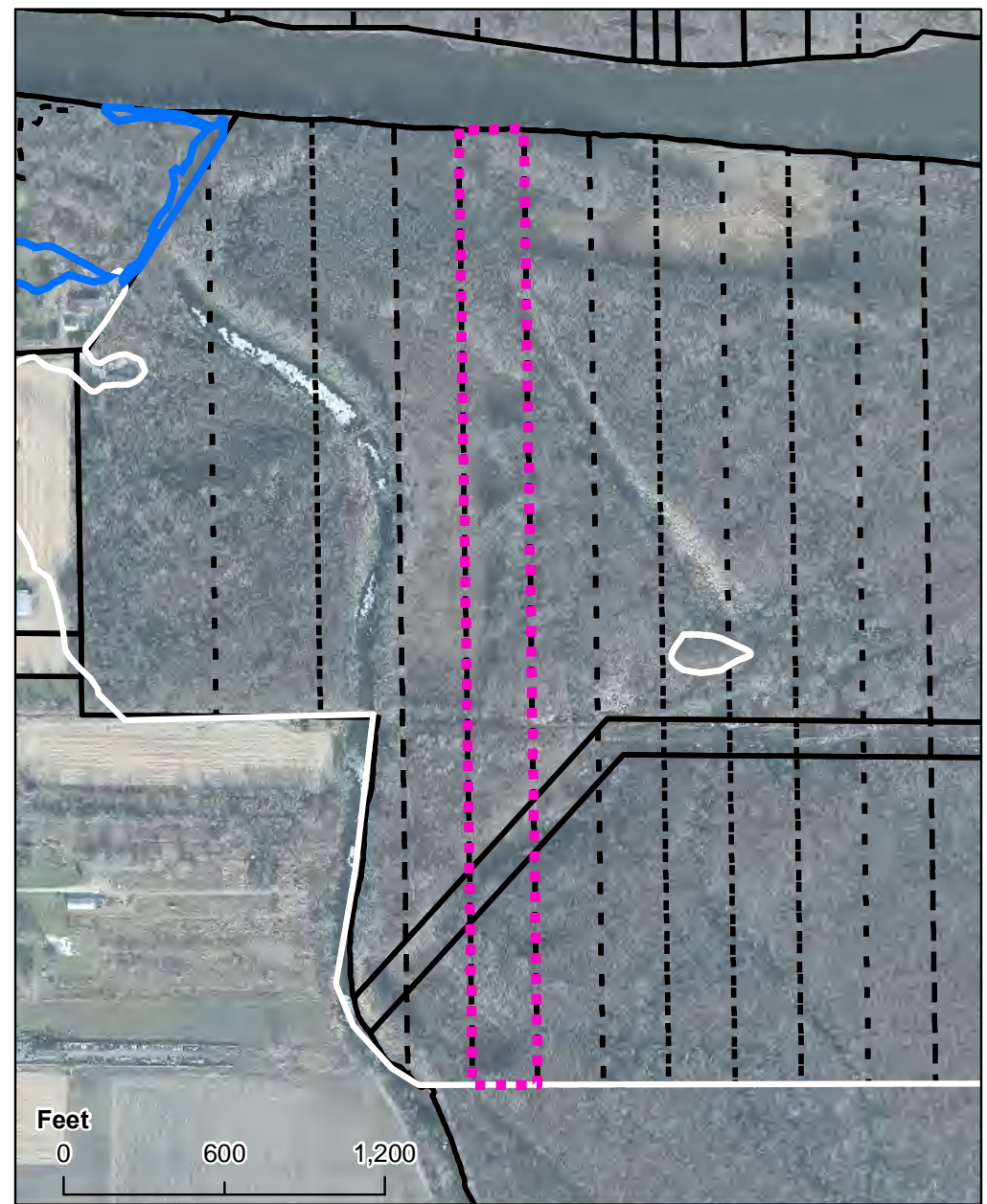
Area in 8-year Floodplain: 499.24 acres

Area of DU: 20.00 acres

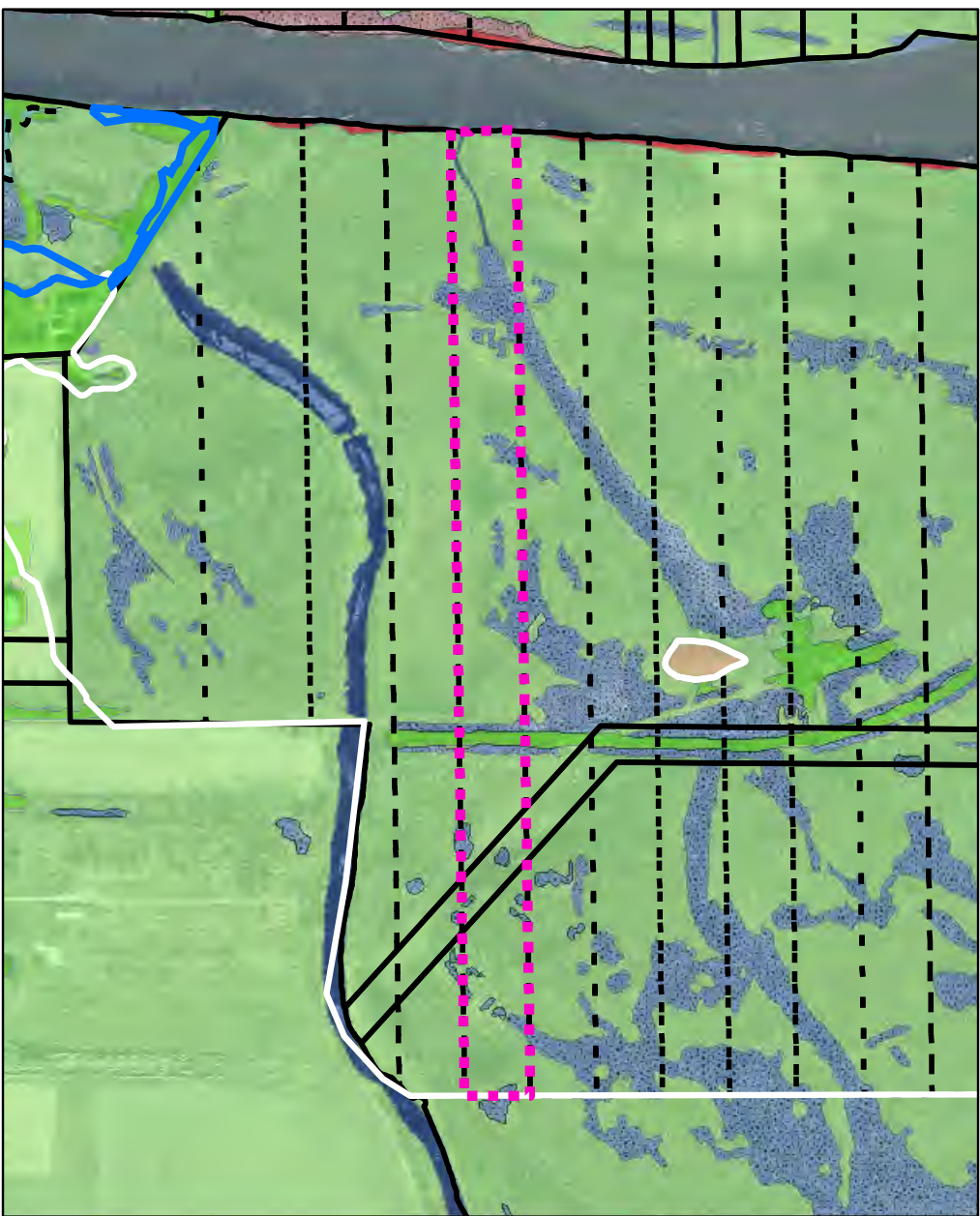
Rev 0 — July 27th, 2021

LAND USE VERIFIED

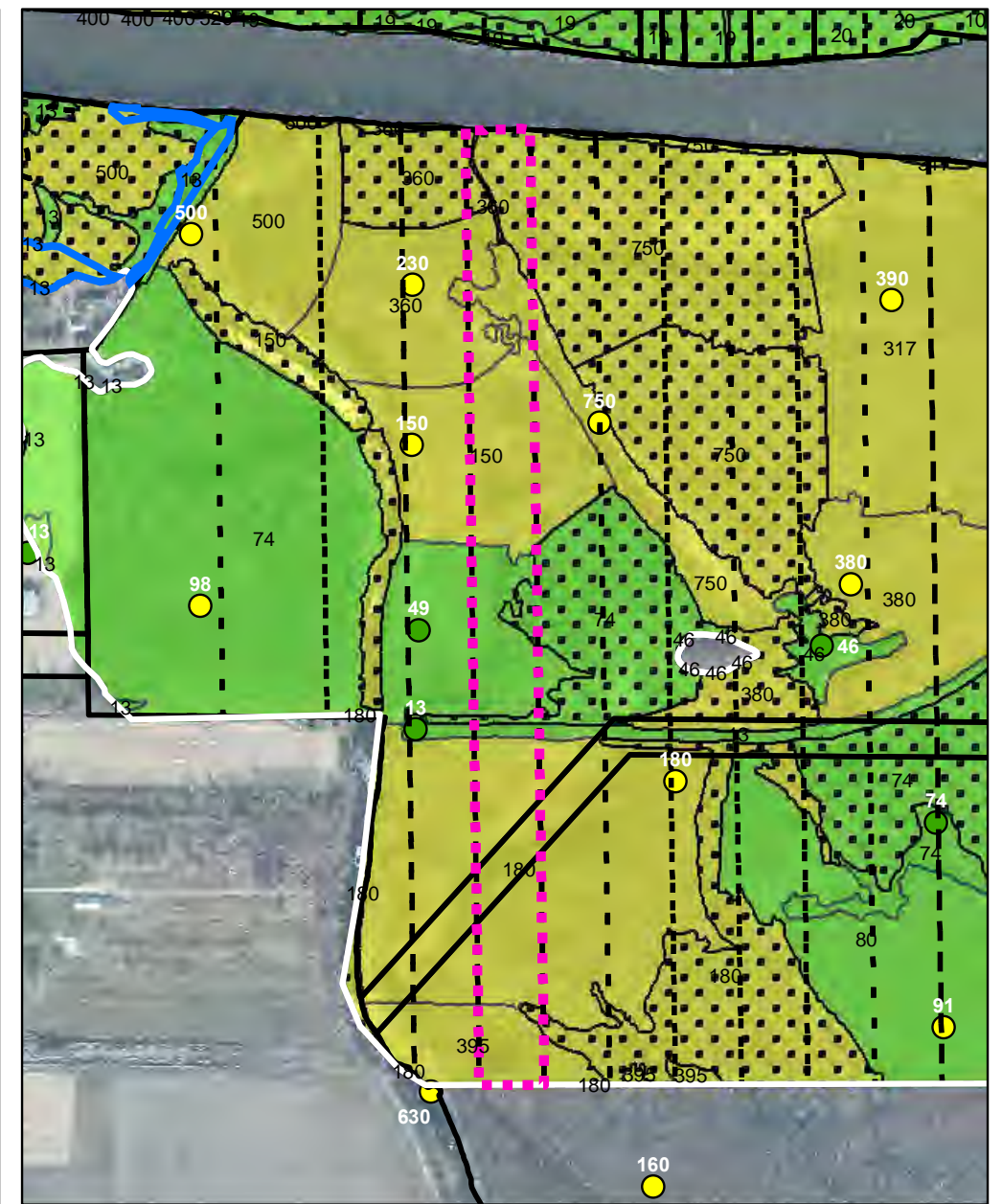
Aerial Background



Geomorphic Polygons



SAC Polygons and Existing Samples



Decision Unit ID – S7_120-123_DU05
Tittabawassee River Floodplain Post-Removal Site Control Plan
Appendix B

Figure
S7_120-
123_5

Area in 8-year Floodplain: 499.24 acres

Area of DU: 20.05 acres

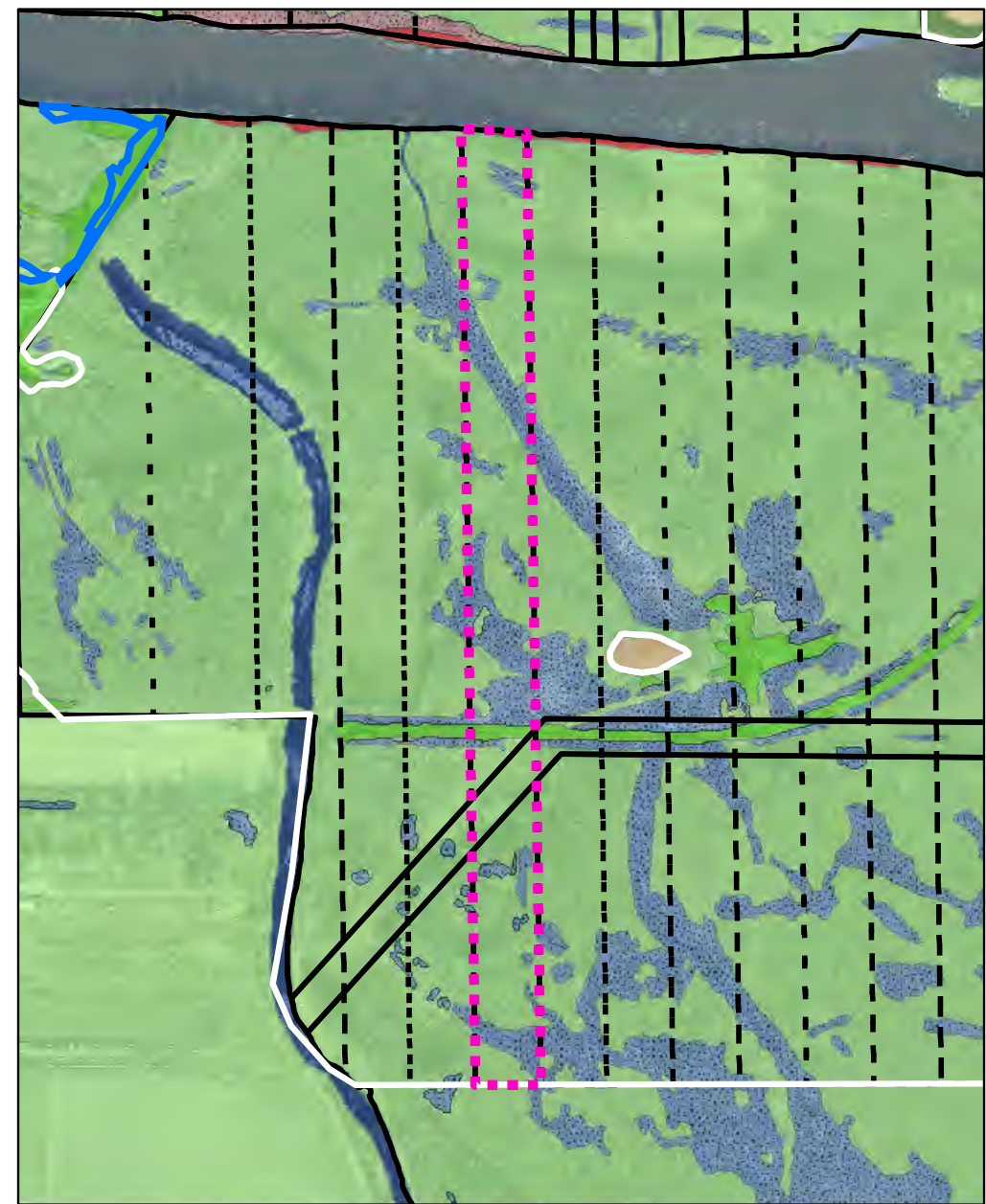
Rev 0 — July 27th, 2021

LAND USE VERIFIED

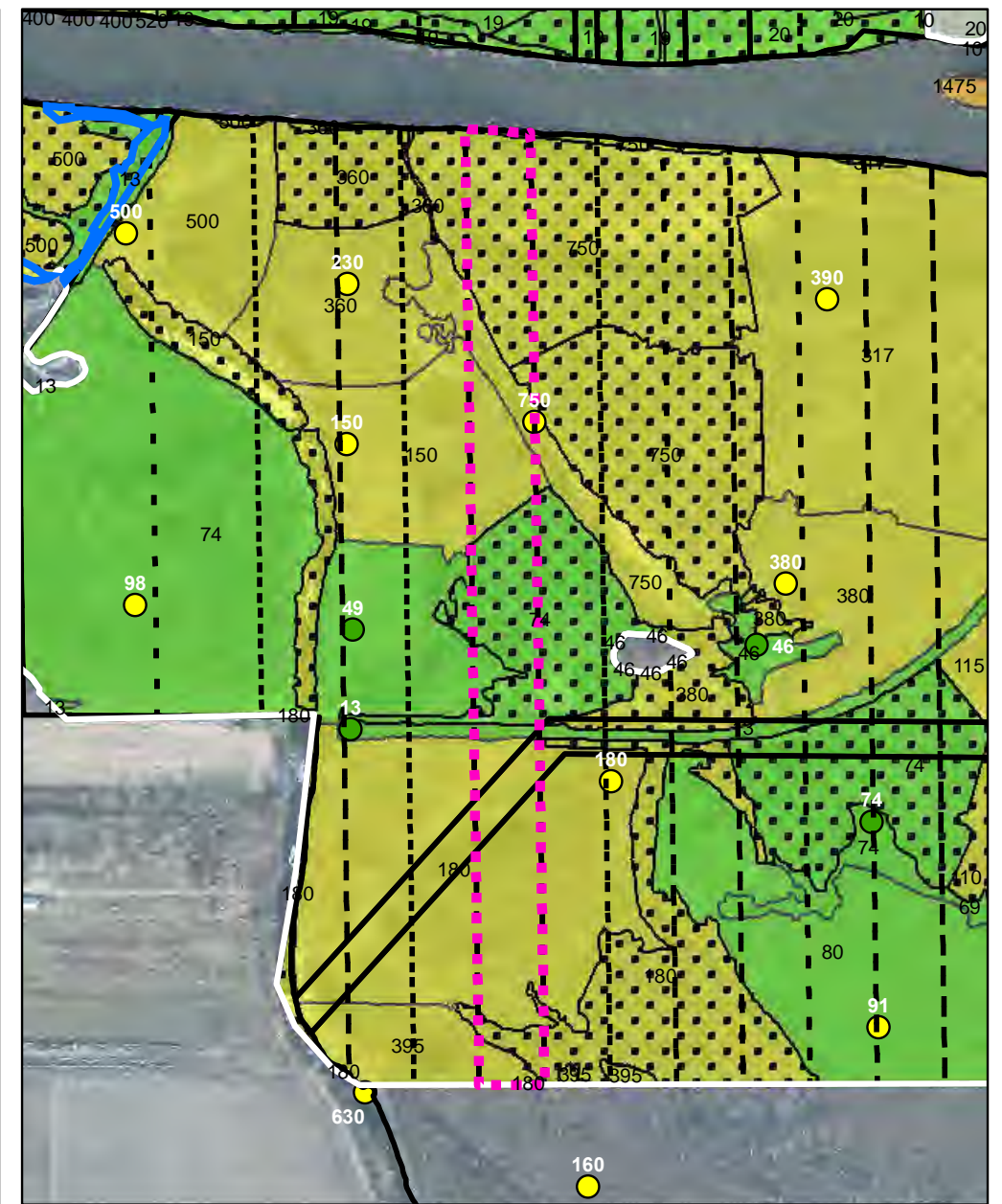
Aerial Background



Geomorphic Polygons



SAC Polygons and Existing Samples



Decision Unit ID – S7_120-123_DU06
Tittabawassee River Floodplain Post-Removal Site Control Plan
Appendix B

Figure
S7_120-
123_6

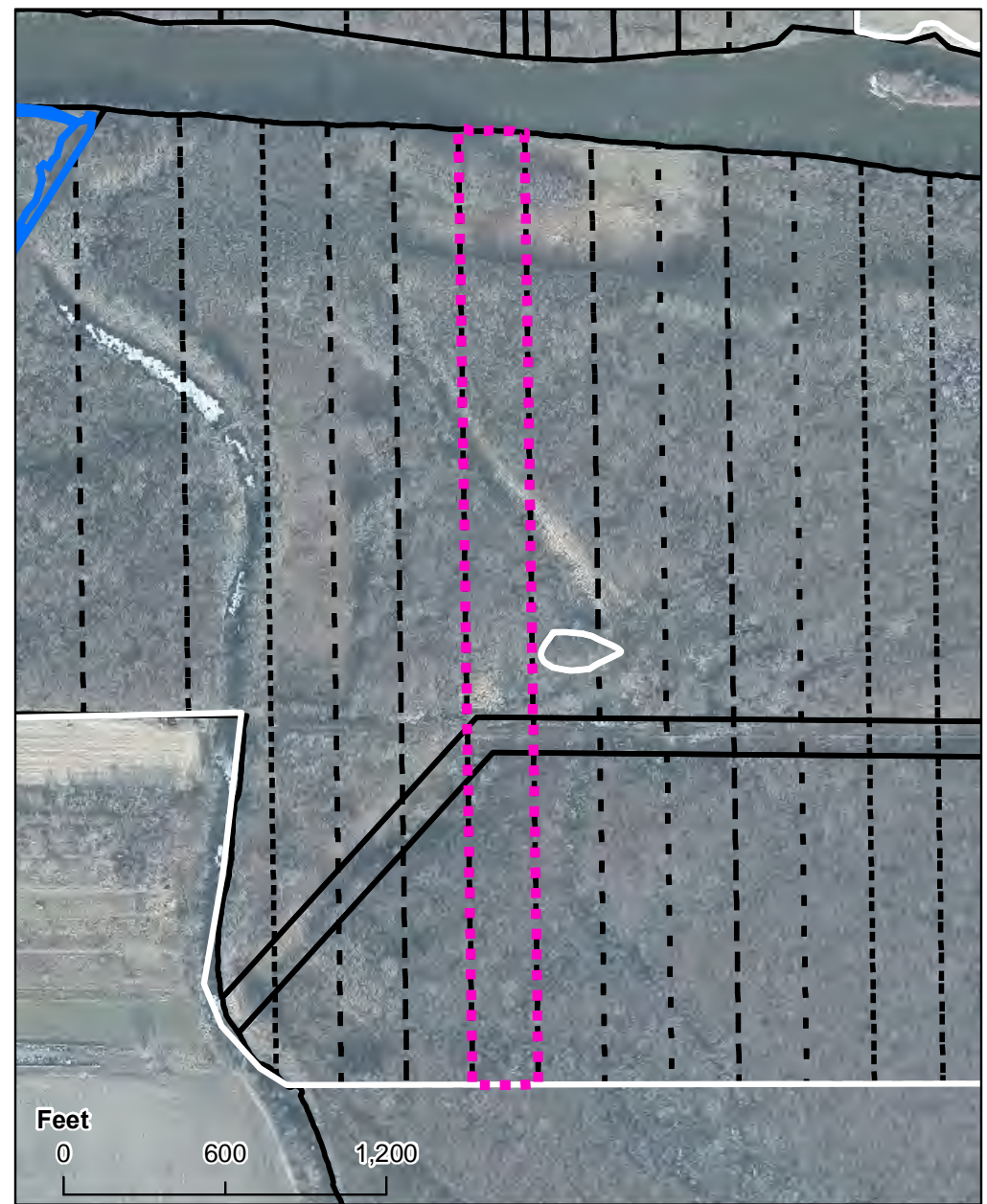
Area in 8-year Floodplain: 499.24 acres

Area of DU: 20.06 acres

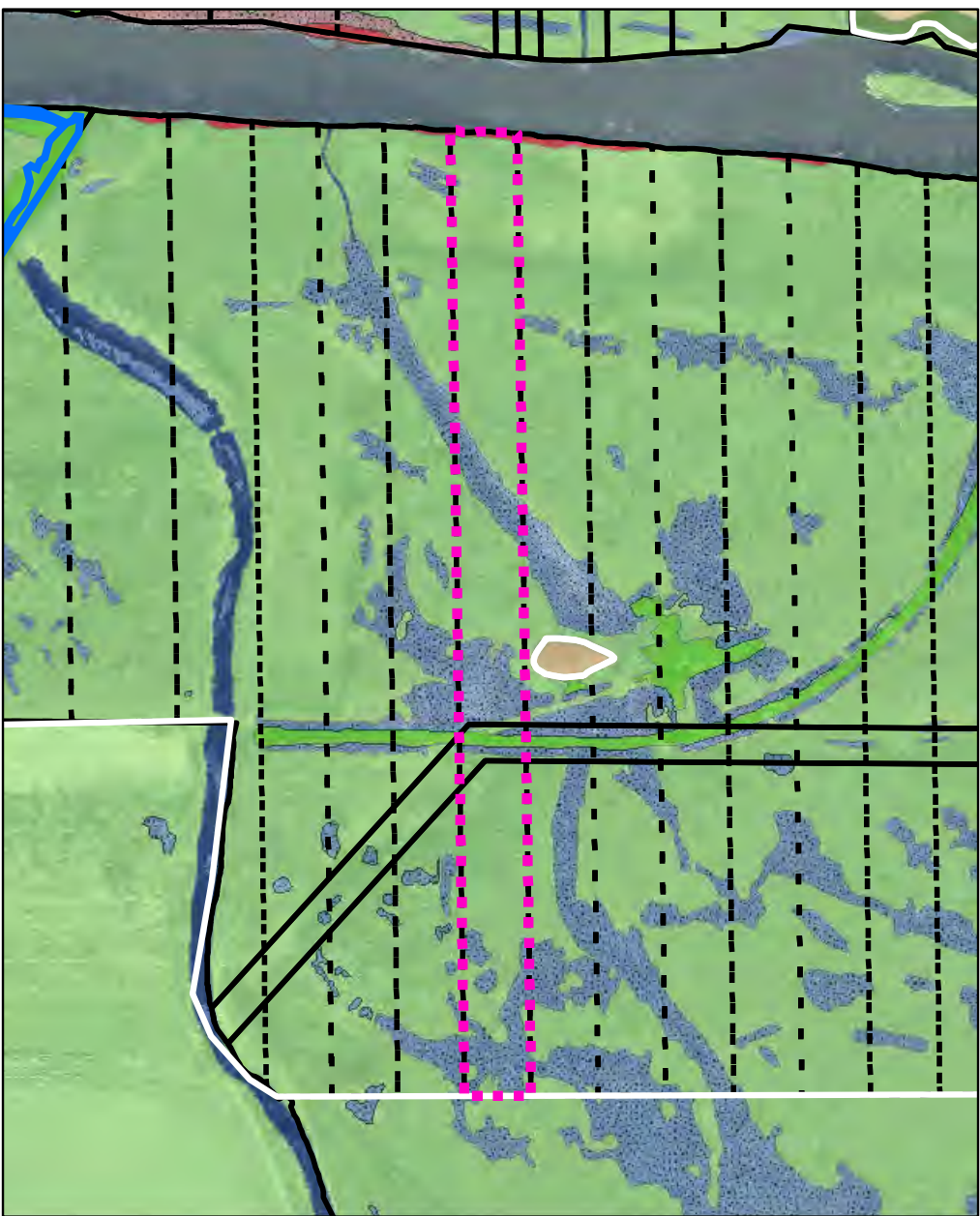
Rev 0 — July 27th, 2021

LAND USE VERIFIED

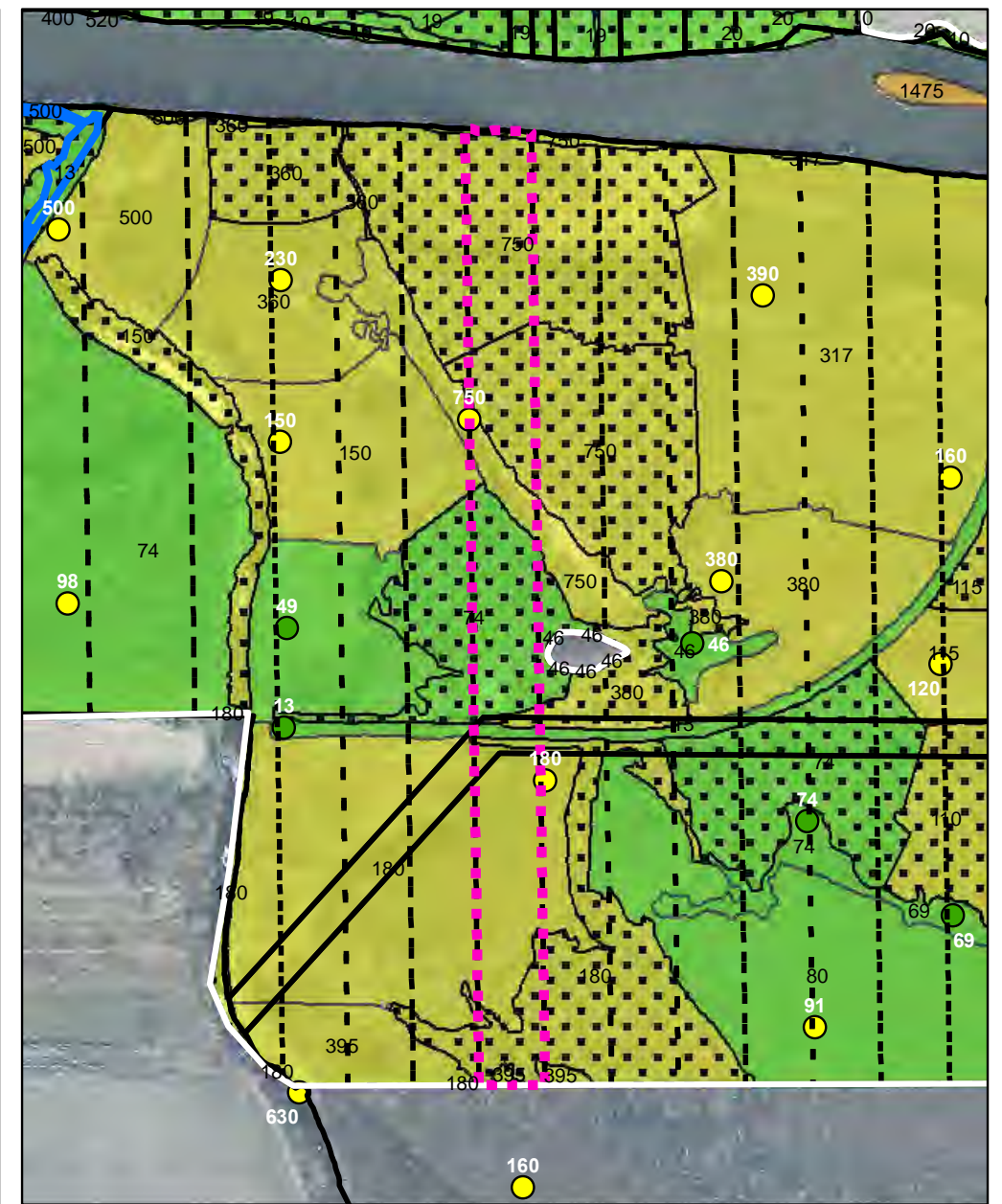
Aerial Background



Geomorphic Polygons



SAC Polygons and Existing Samples



Decision Unit ID – S7_120-123_DU07
Tittabawassee River Floodplain Post-Removal Site Control Plan
Appendix B

Figure
S7_120-
123_7

Area in 8-year Floodplain: 499.24 acres

Area of DU: 19.48 acres

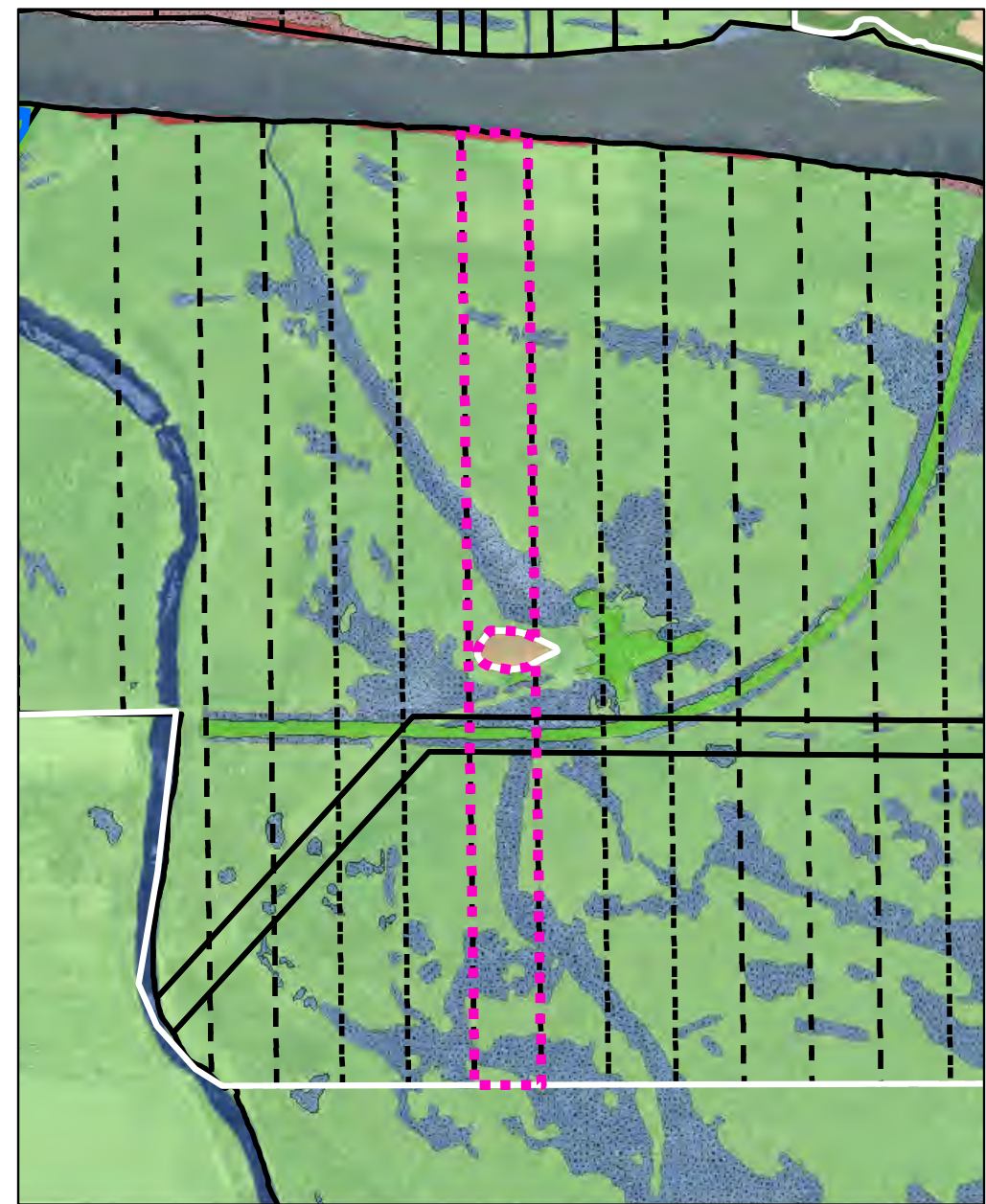
Rev 0 — July 27th, 2021

LAND USE VERIFIED

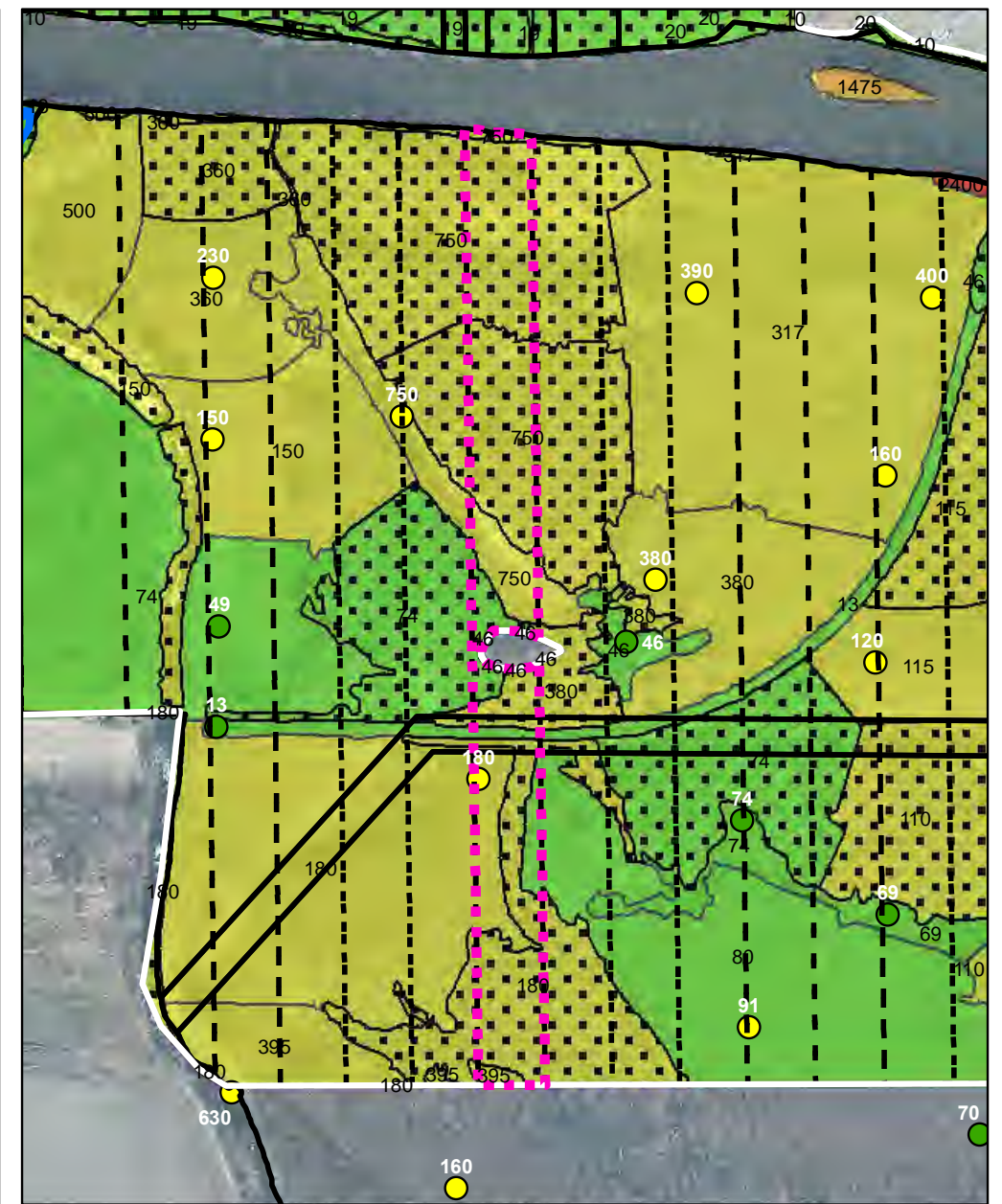
Aerial Background



Geomorphic Polygons



SAC Polygons and Existing Samples



Decision Unit ID – S7_120-123_DU08
Tittabawassee River Floodplain Post-Removal Site Control Plan
Appendix B

Figure
S7_120-
123_8

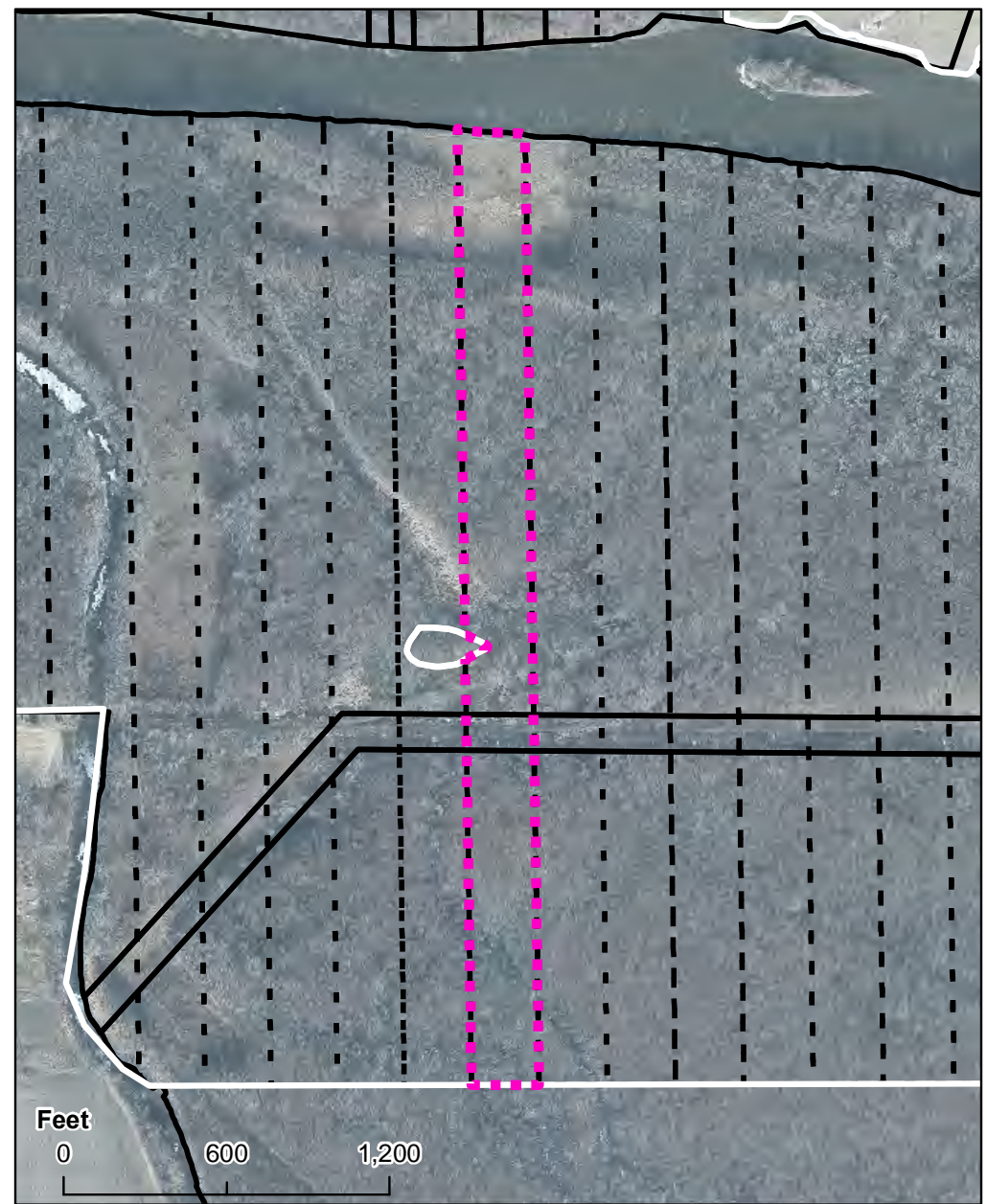
Area in 8-year Floodplain: 499.24 acres

Area of DU: 19.96 acres

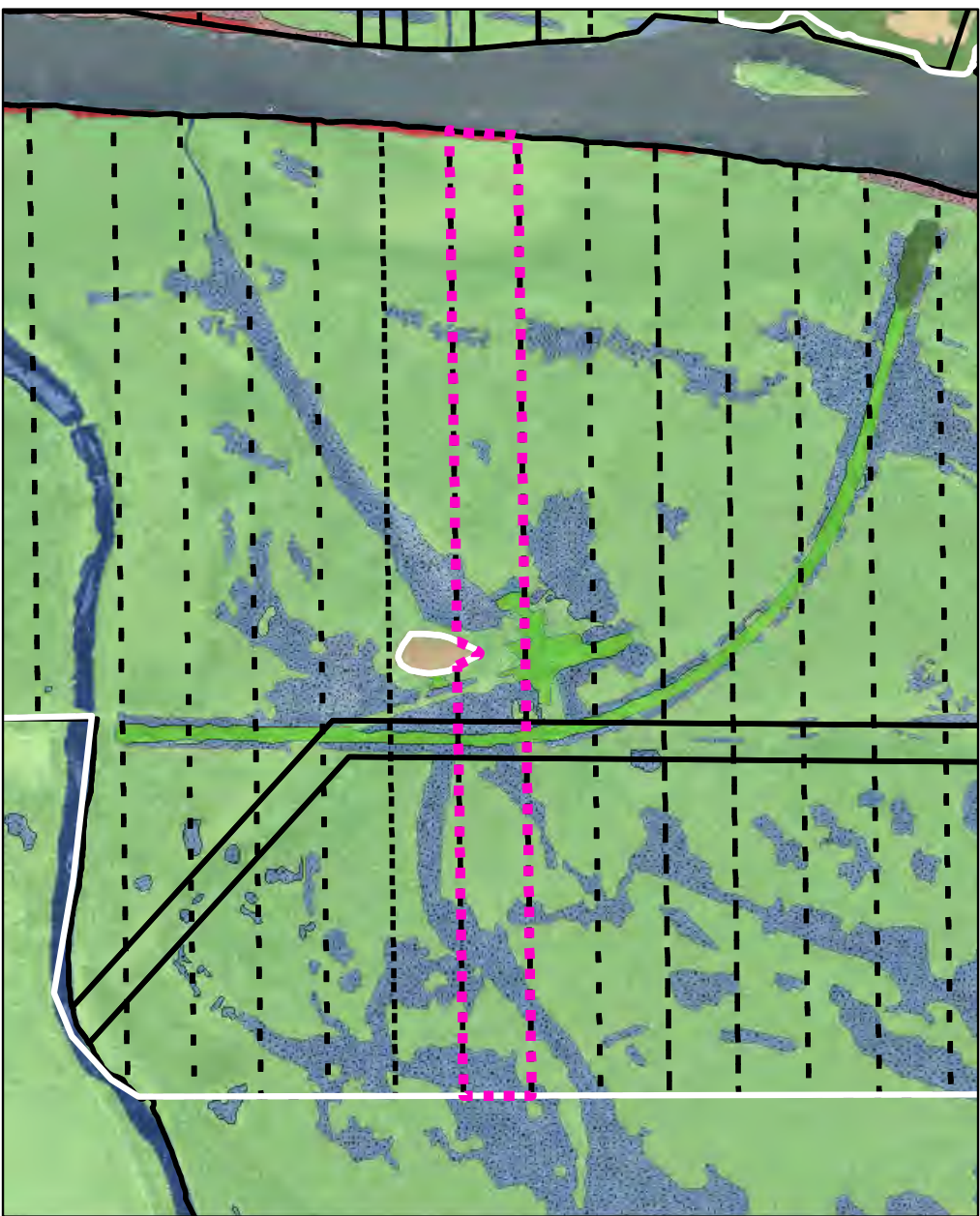
Rev 0 — July 27th, 2021

LAND USE VERIFIED

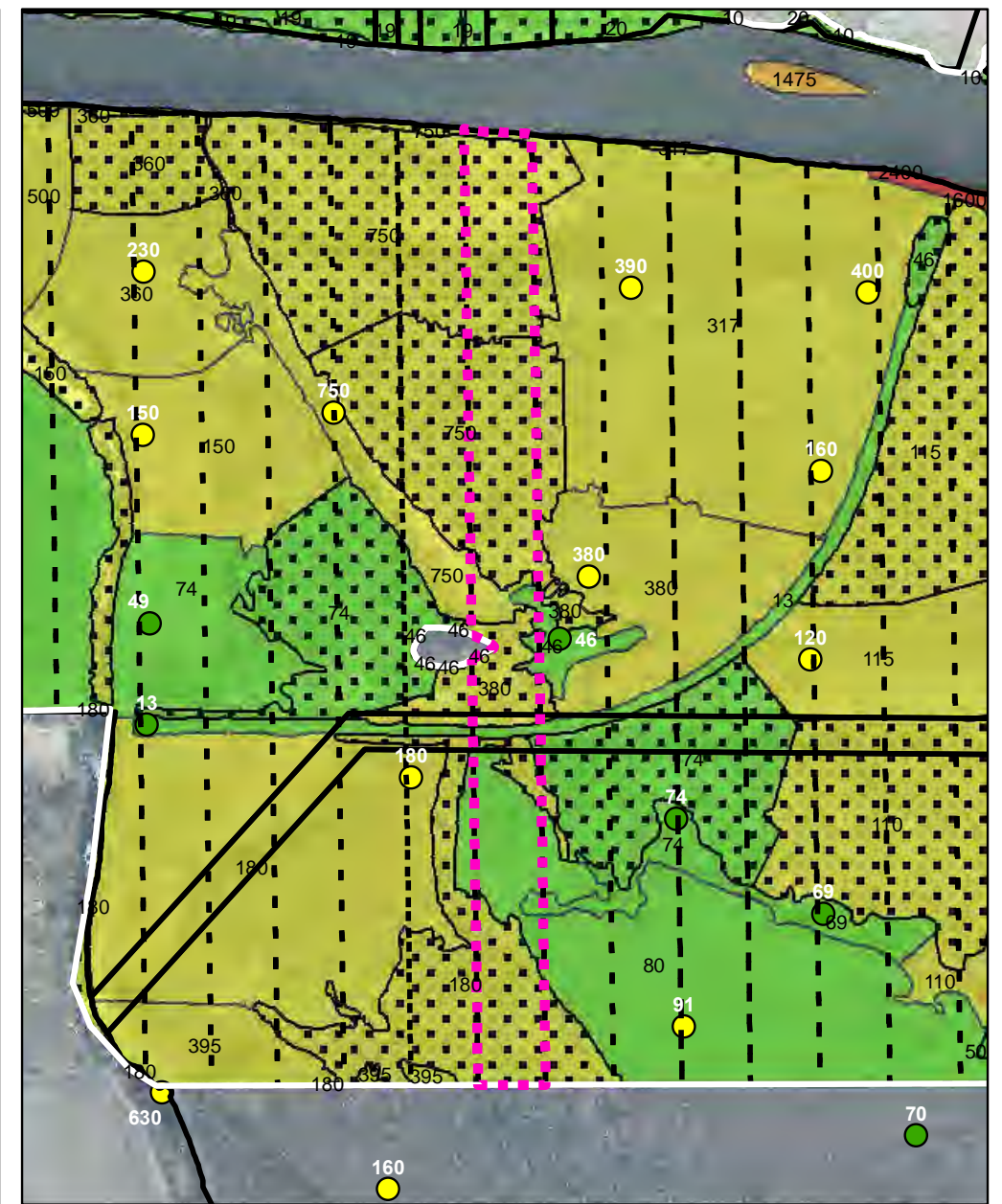
Aerial Background



Geomorphic Polygons



SAC Polygons and Existing Samples



Decision Unit ID – S7_120-123_DU09
Tittabawassee River Floodplain Post-Removal Site Control Plan
Appendix B

Figure
S7_120-
123_9

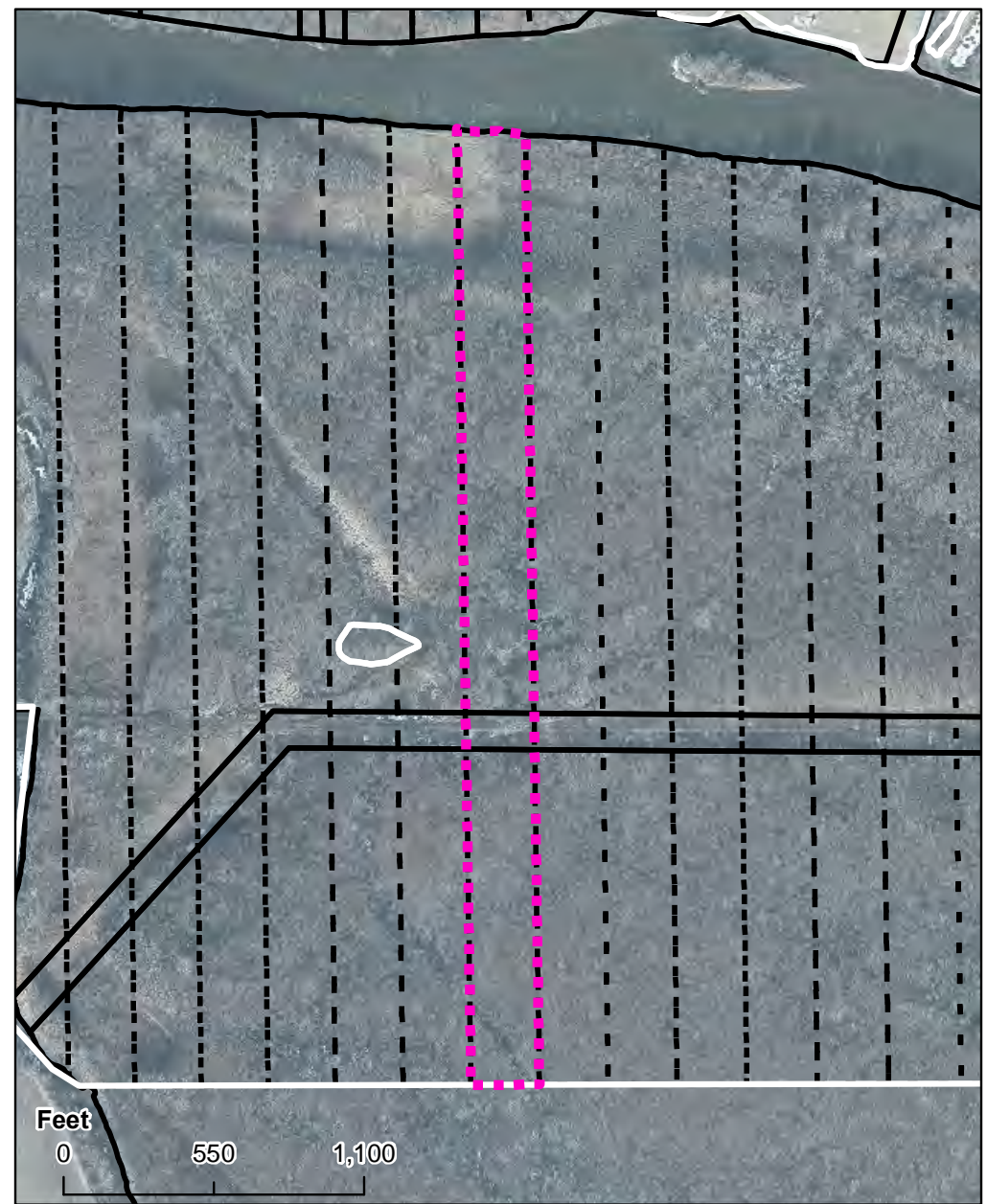
Area in 8-year Floodplain: 499.24 acres

Area of DU: 20.05 acres

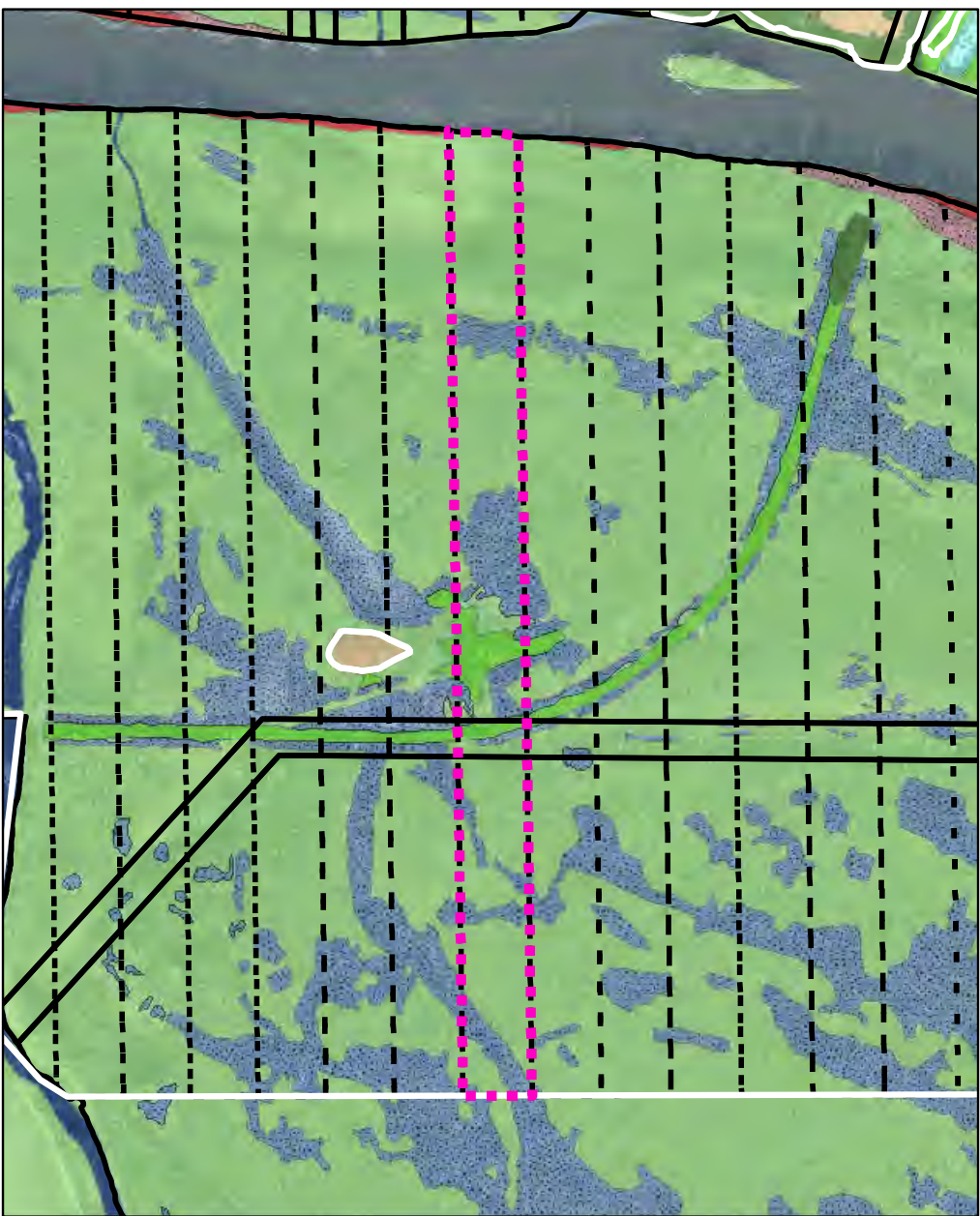
Rev 0 — July 27th, 2021

LAND USE VERIFIED

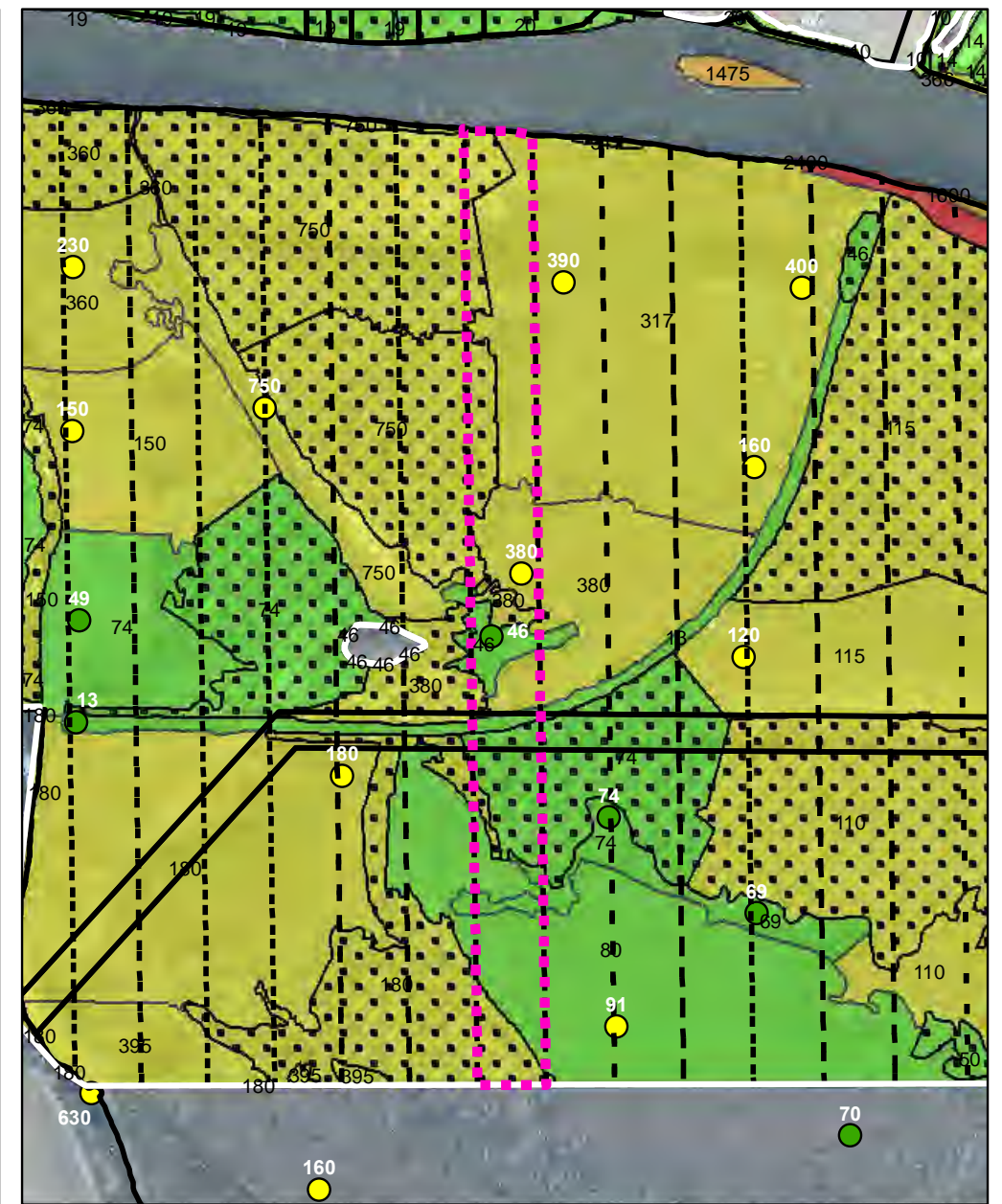
Aerial Background



Geomorphic Polygons



SAC Polygons and Existing Samples



Decision Unit ID – S7_120-123_DU10
Tittabawassee River Floodplain Post-Removal Site Control Plan
Appendix B

Figure
S7_120-
123_10

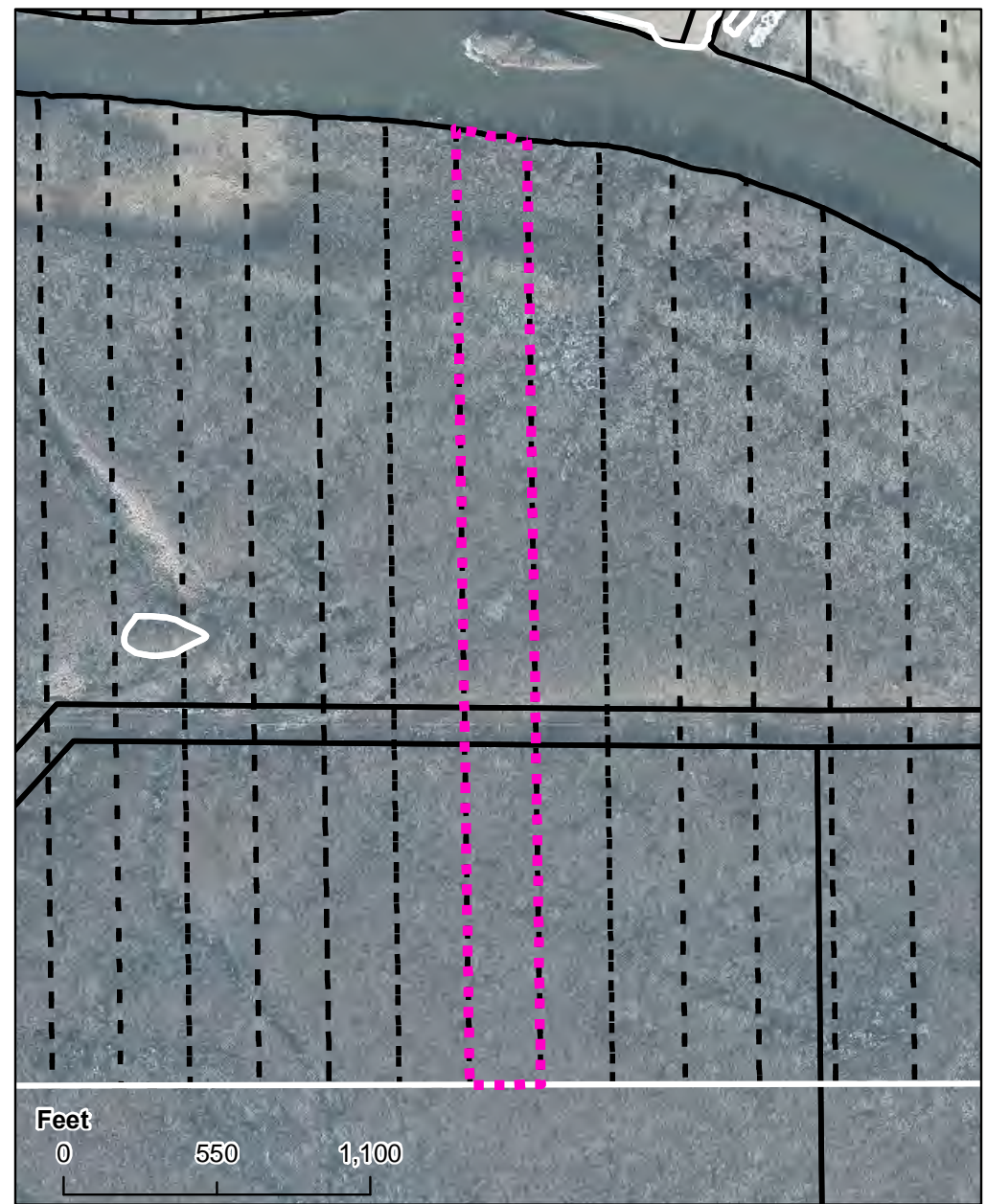
Area in 8-year Floodplain: 499.24 acres

Area of DU: 19.97 acres

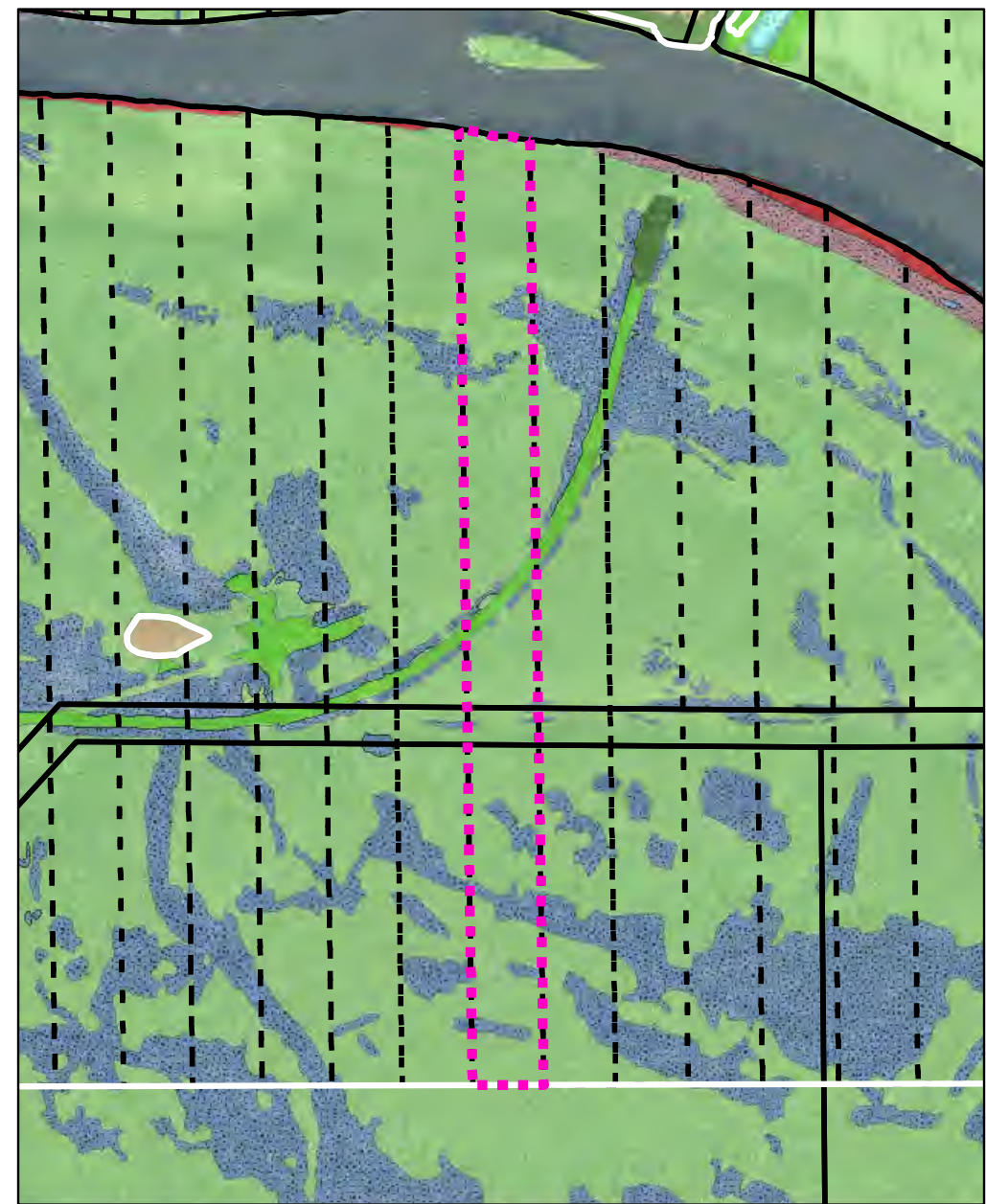
Rev 0 — July 27th, 2021

LAND USE VERIFIED

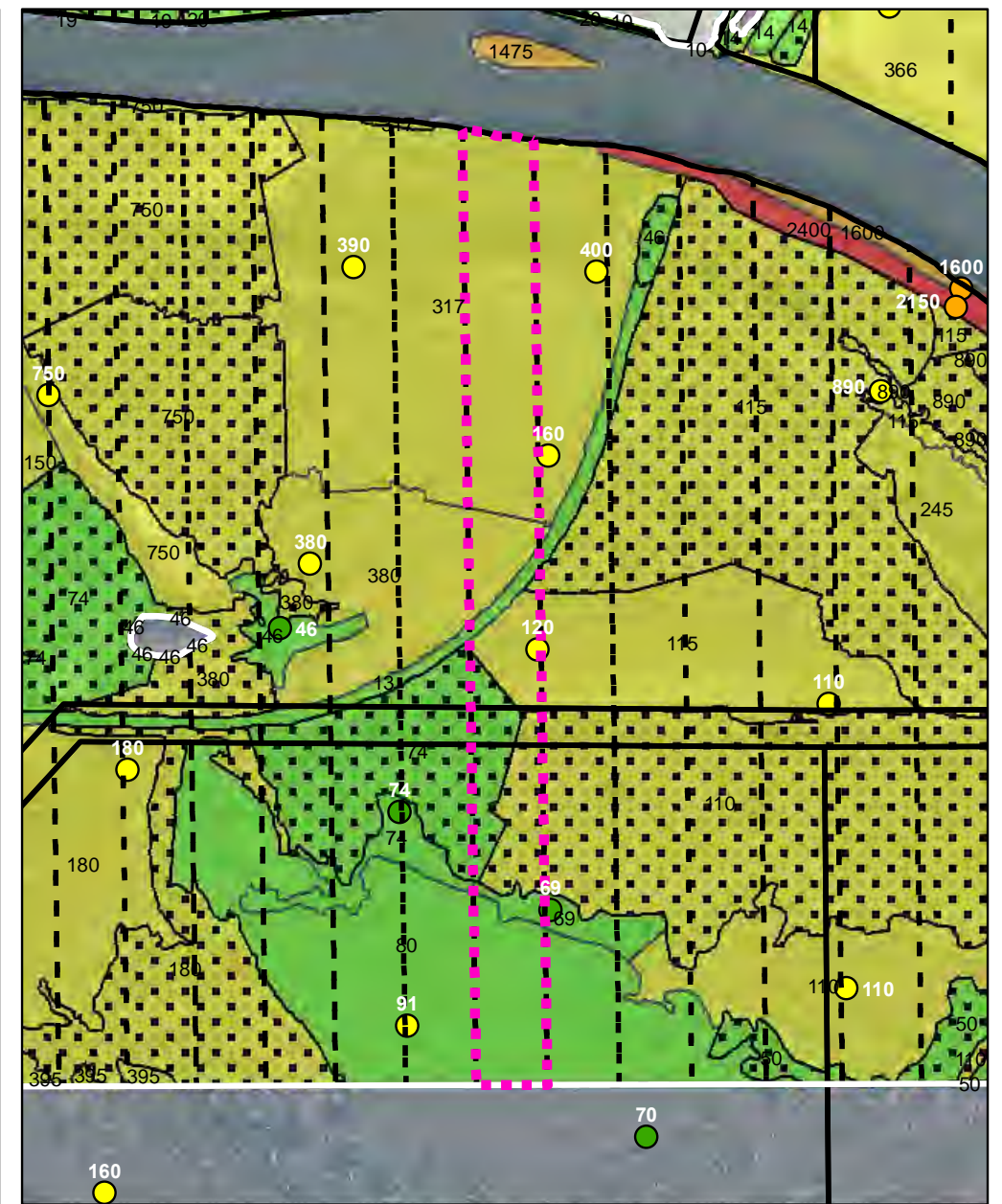
Aerial Background



Geomorphic Polygons



SAC Polygons and Existing Samples



Decision Unit ID – S7_120-123_DU13
Tittabawassee River Floodplain Post-Removal Site Control Plan
Appendix B

Figure
S7_120-
123_13

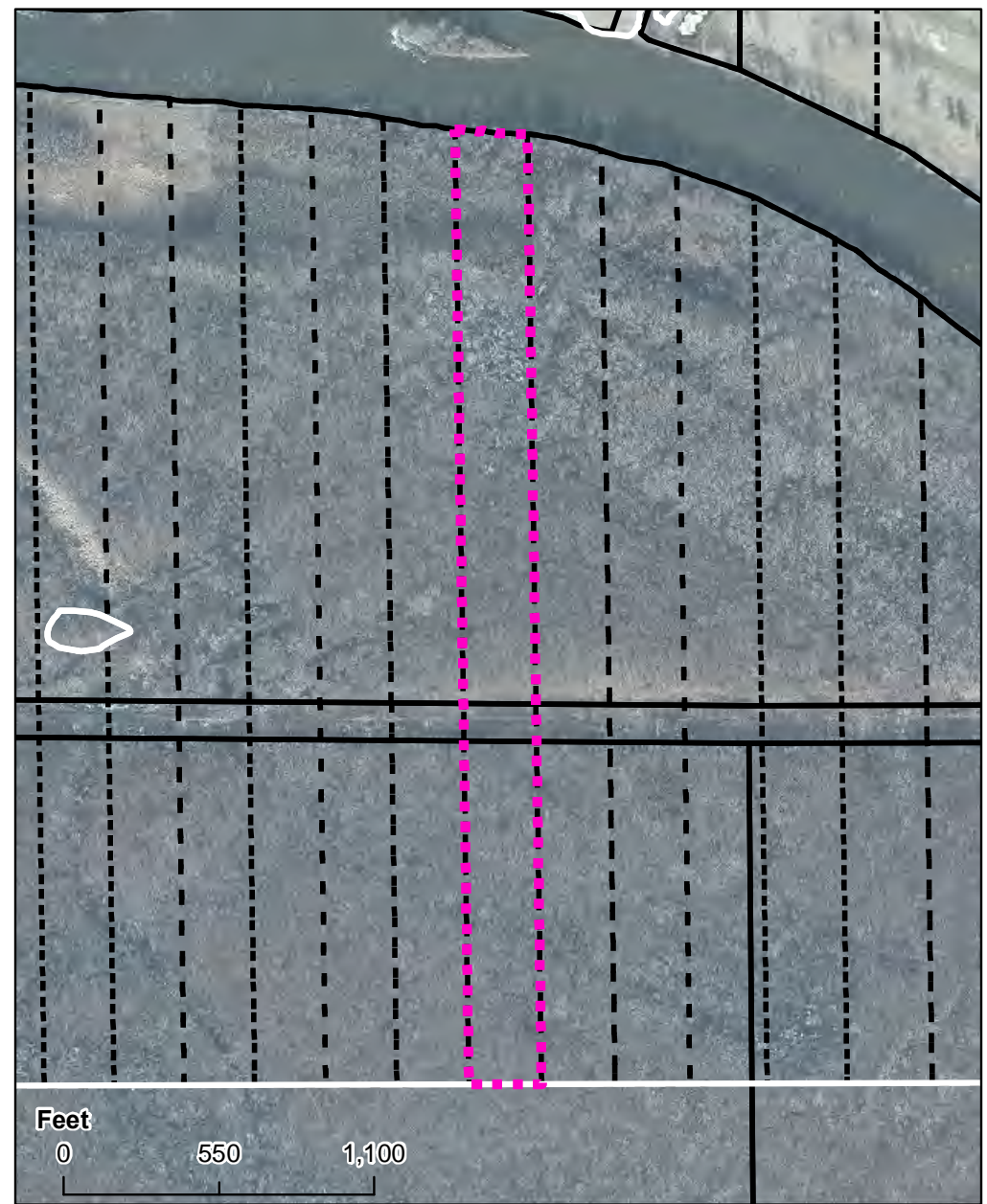
Area in 8-year Floodplain: 499.24 acres

Area of DU: 20.00 acres

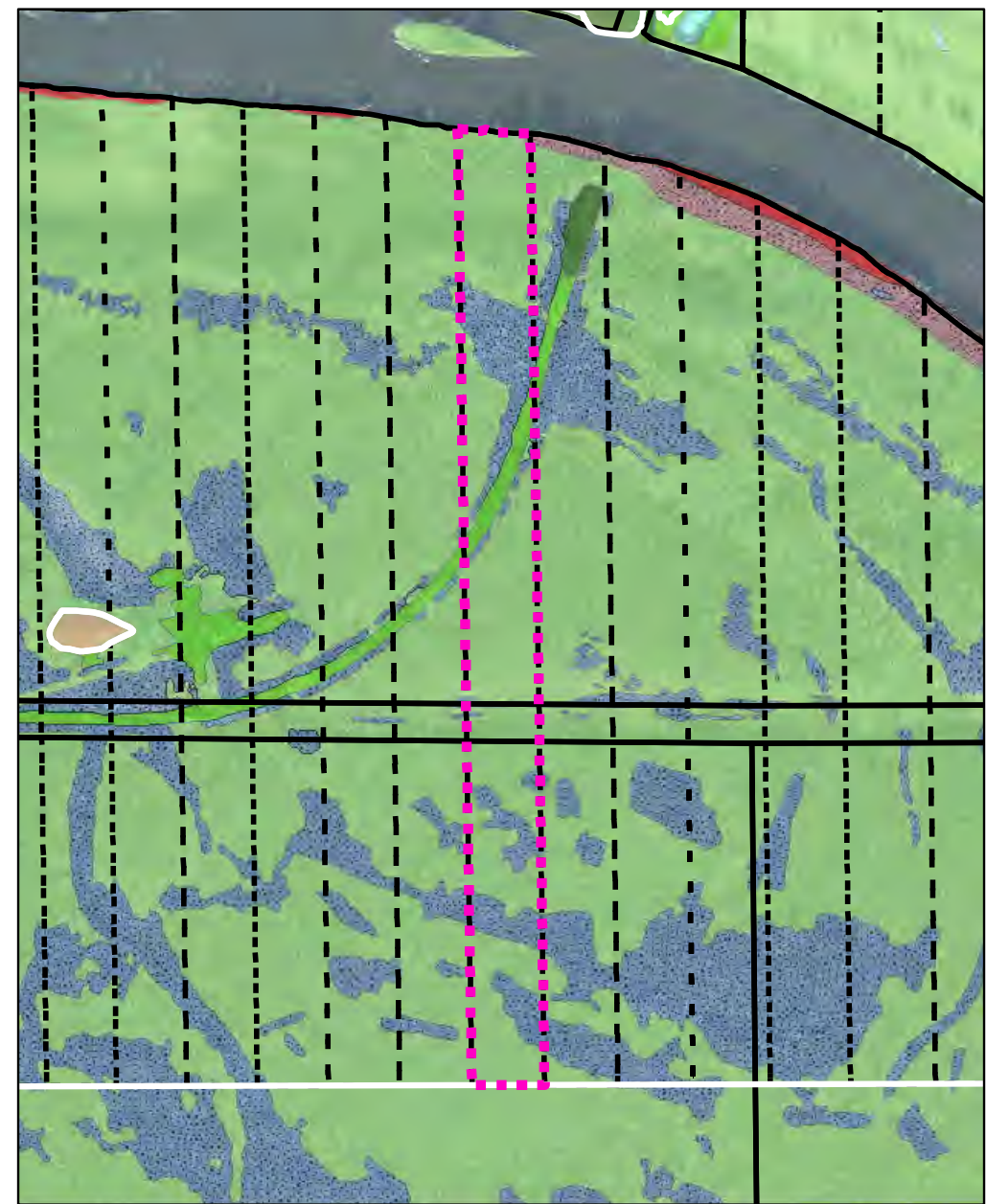
Rev 0 — July 27th, 2021

LAND USE VERIFIED

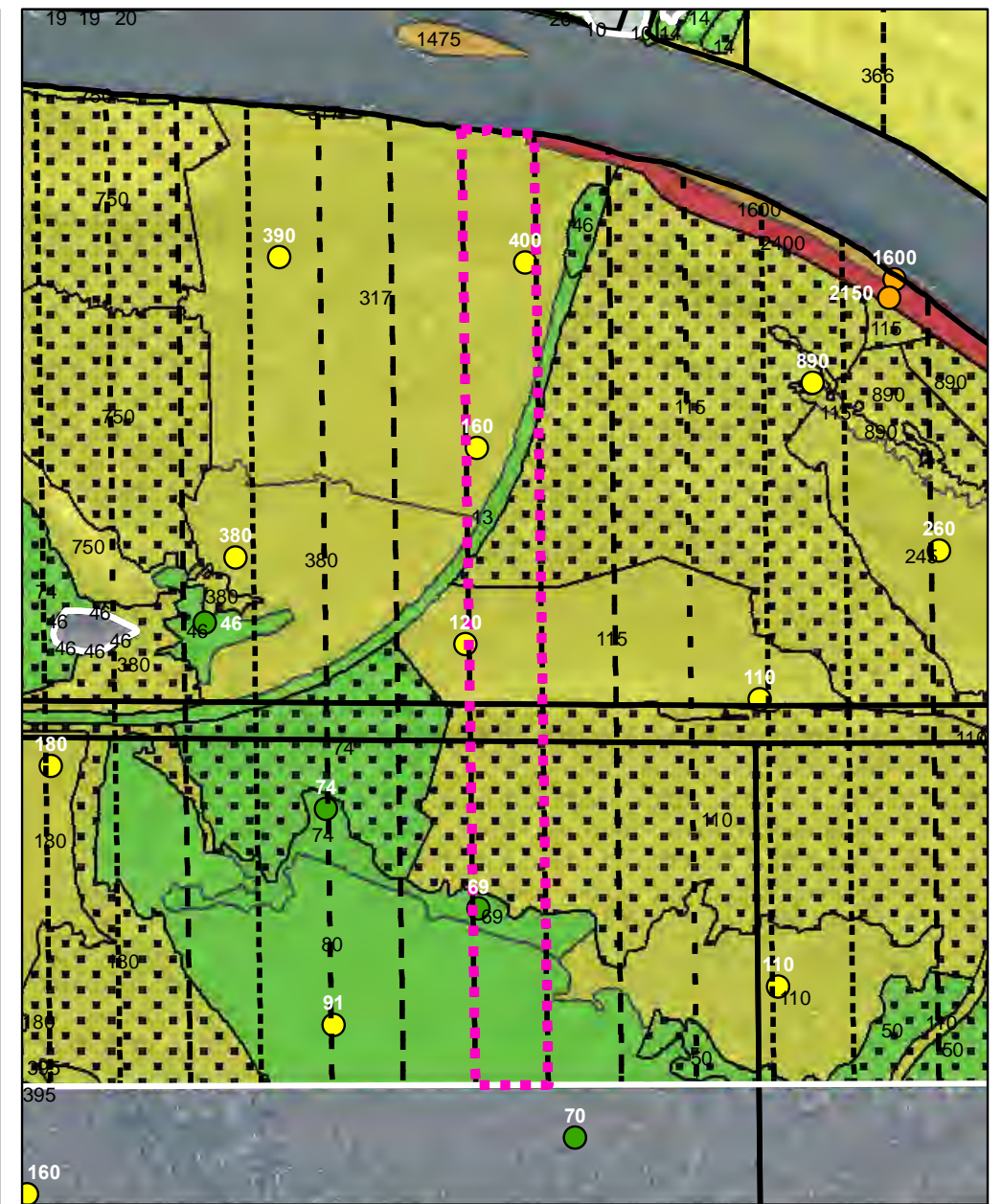
Aerial Background



Geomorphic Polygons



SAC Polygons and Existing Samples



Decision Unit ID – S7_120-123_DU14
Tittabawassee River Floodplain Post-Removal Site Control Plan
Appendix B

Figure
S7_120-
123_14

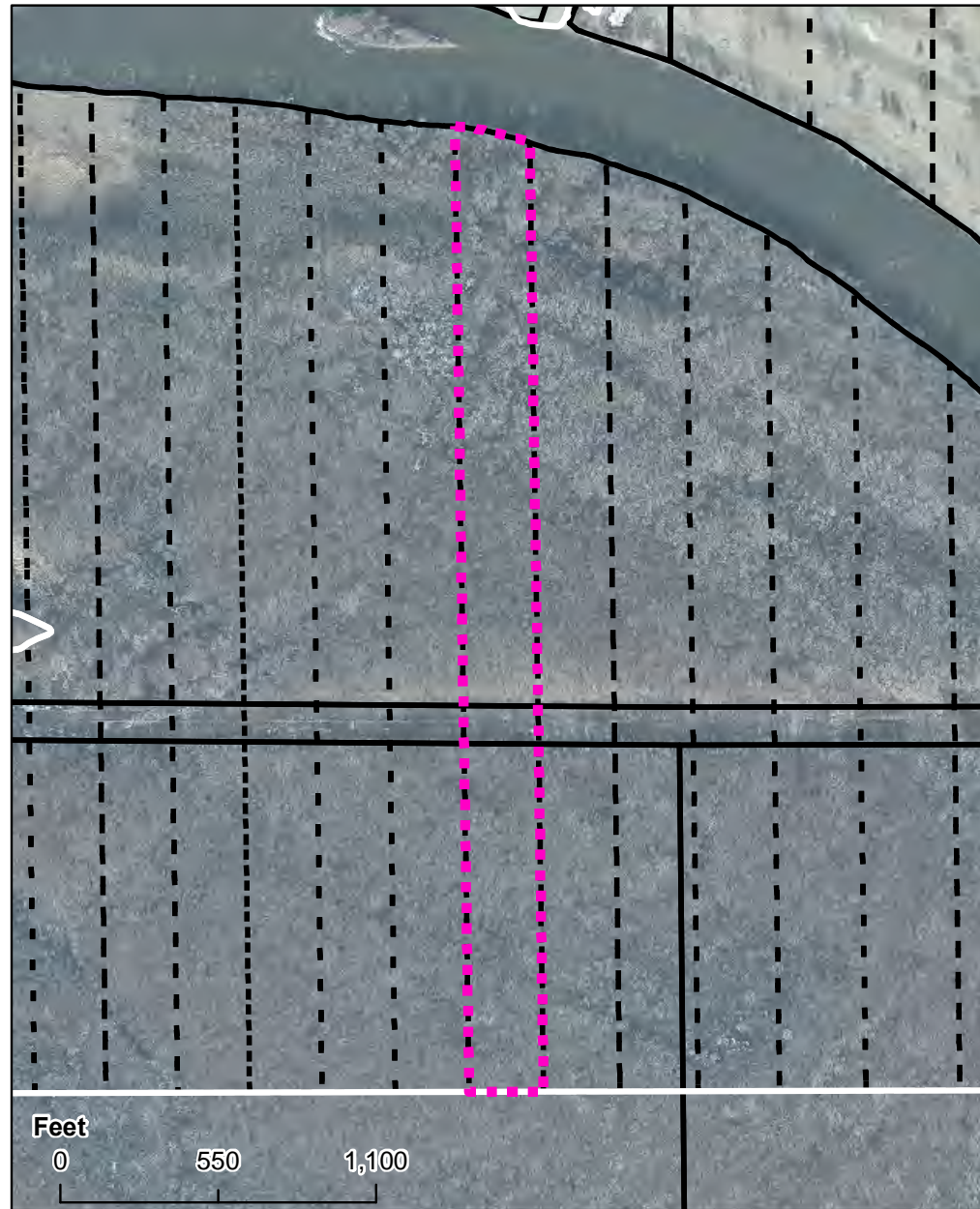
Area in 8-year Floodplain: 499.24 acres

Area of DU: 20.01 acres

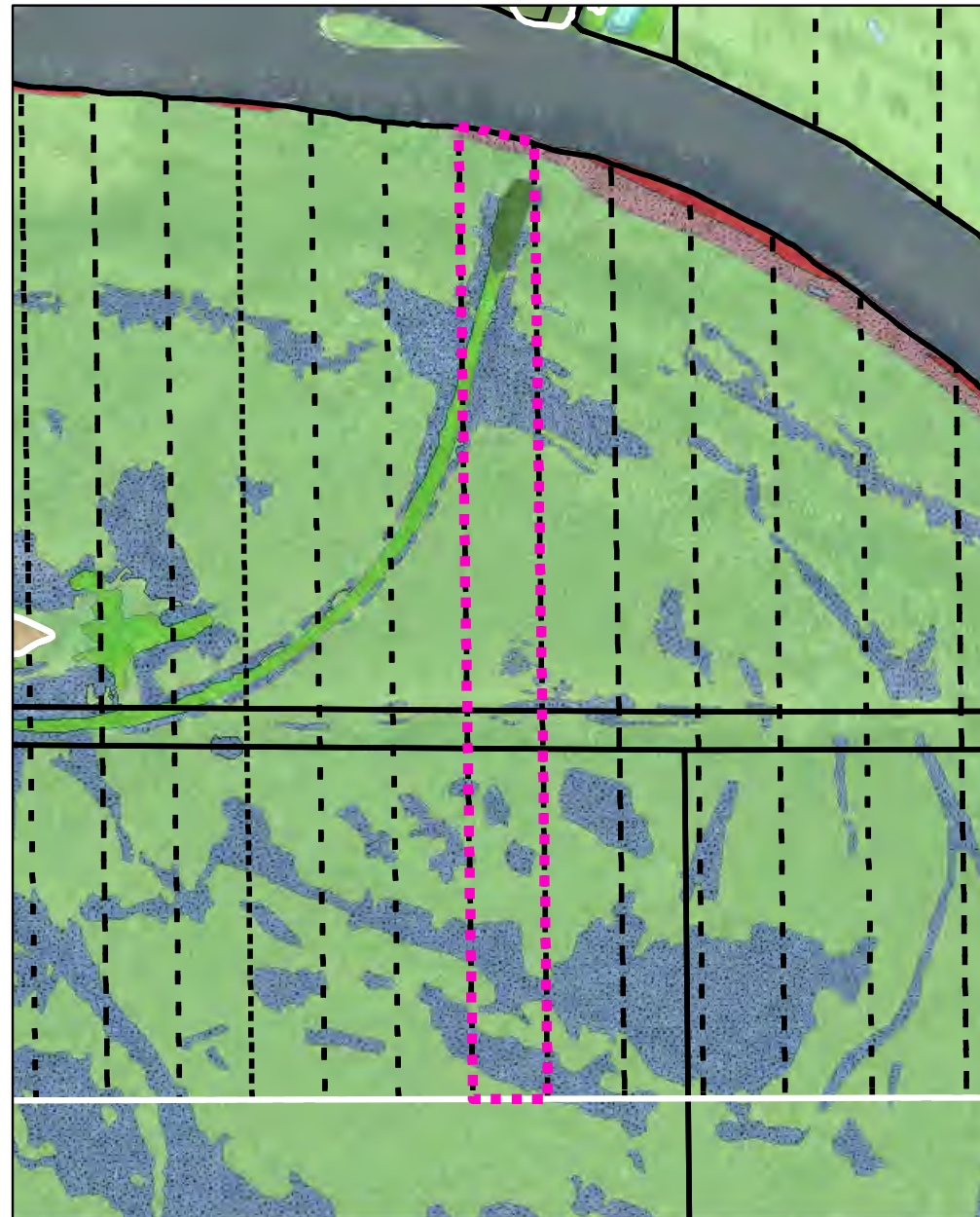
Rev 0 — July 27th, 2021

LAND USE VERIFIED

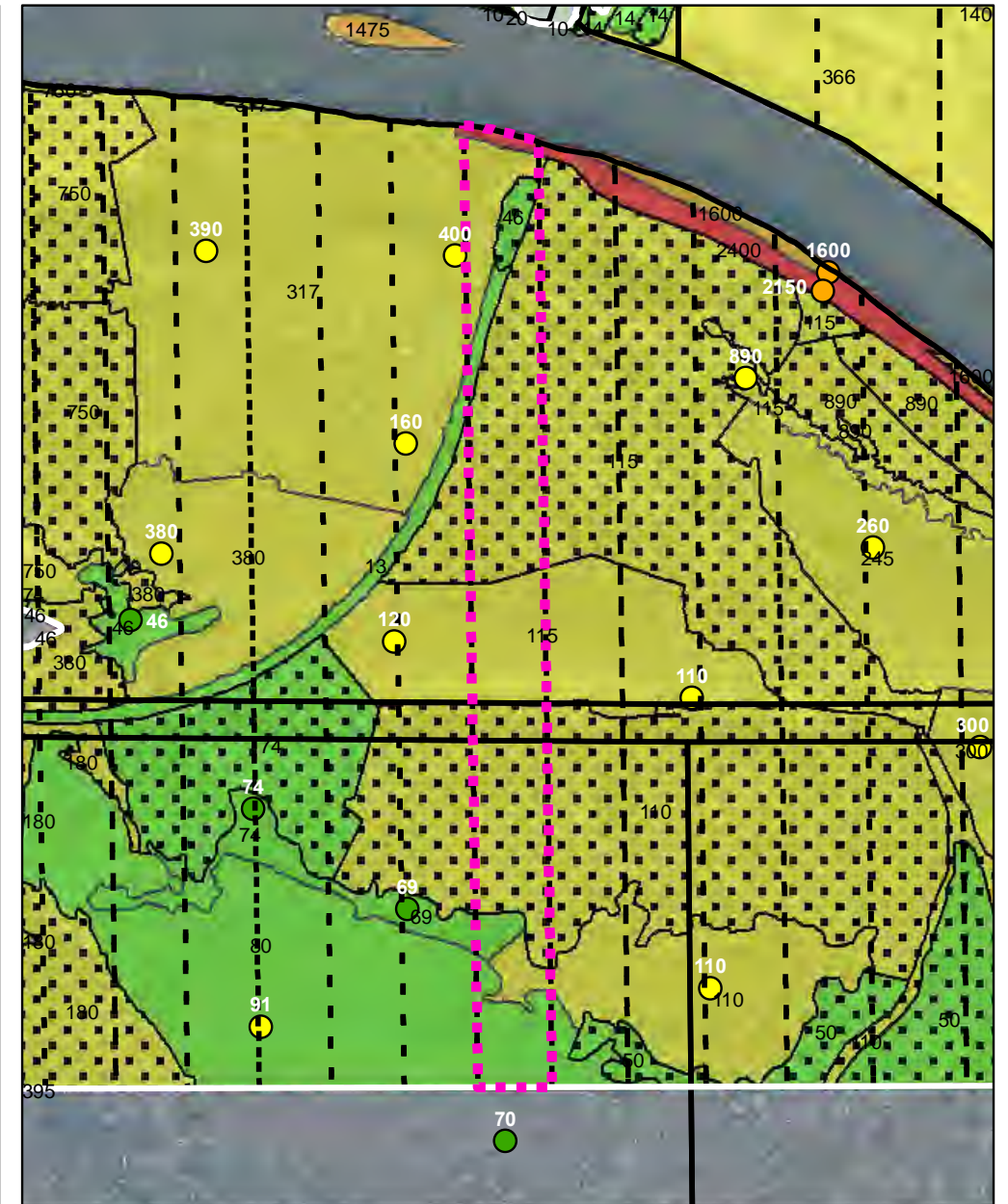
Aerial Background



Geomorphic Polygons



SAC Polygons and Existing Samples



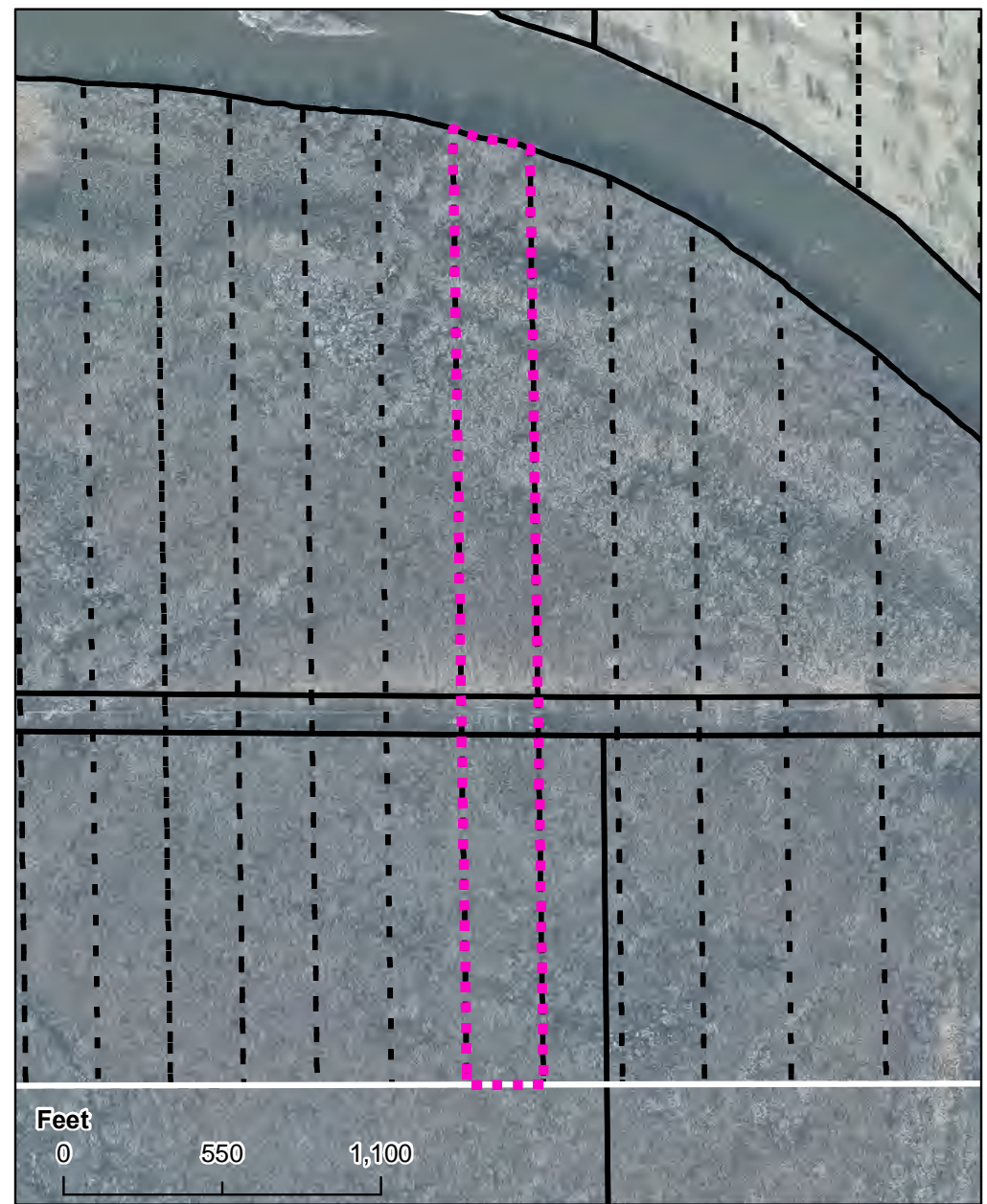
Area in 8-year Floodplain: 499.24 acres

Area of DU: 20.01 acres

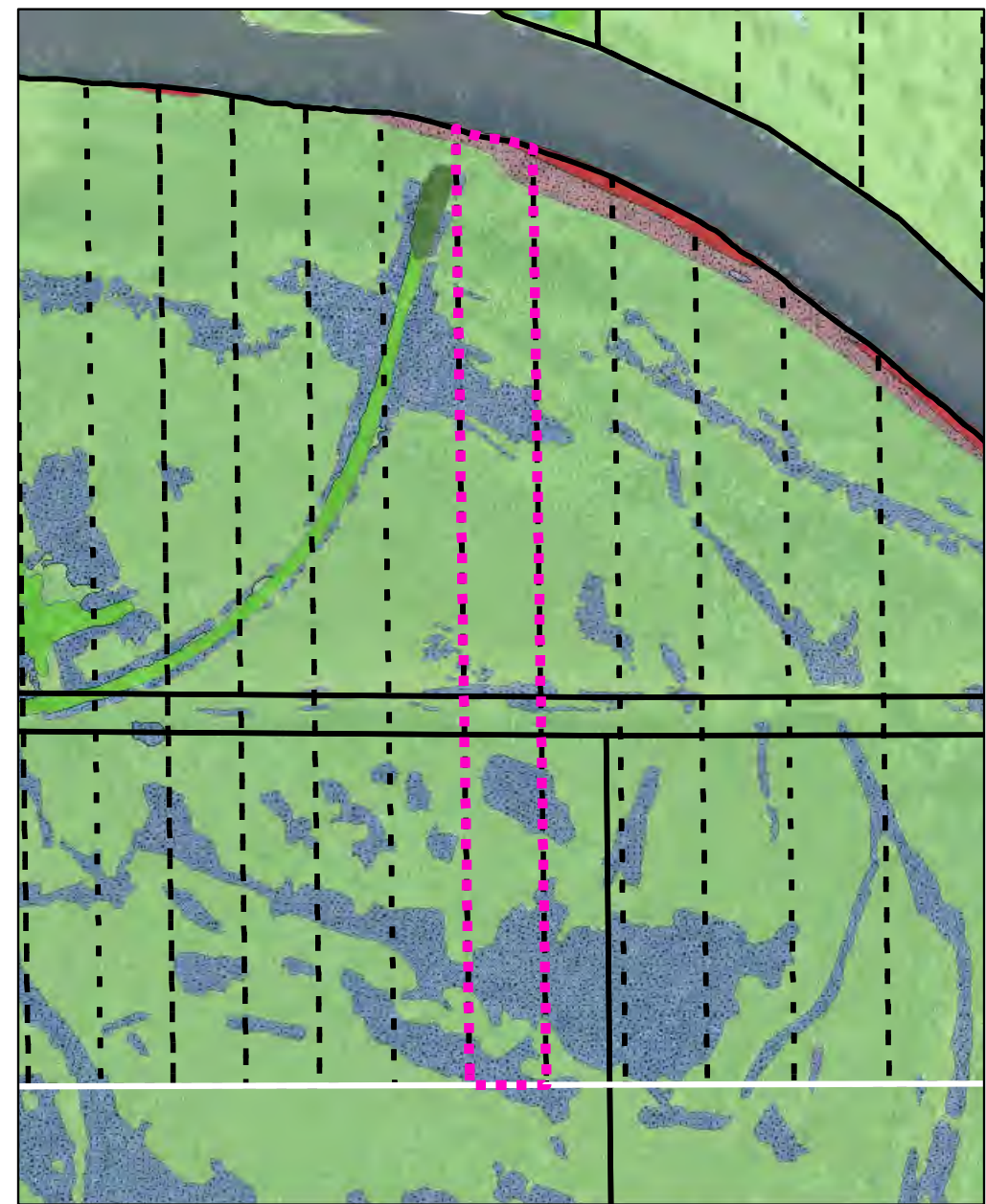
Rev 0 — July 27th, 2021

LAND USE VERIFIED

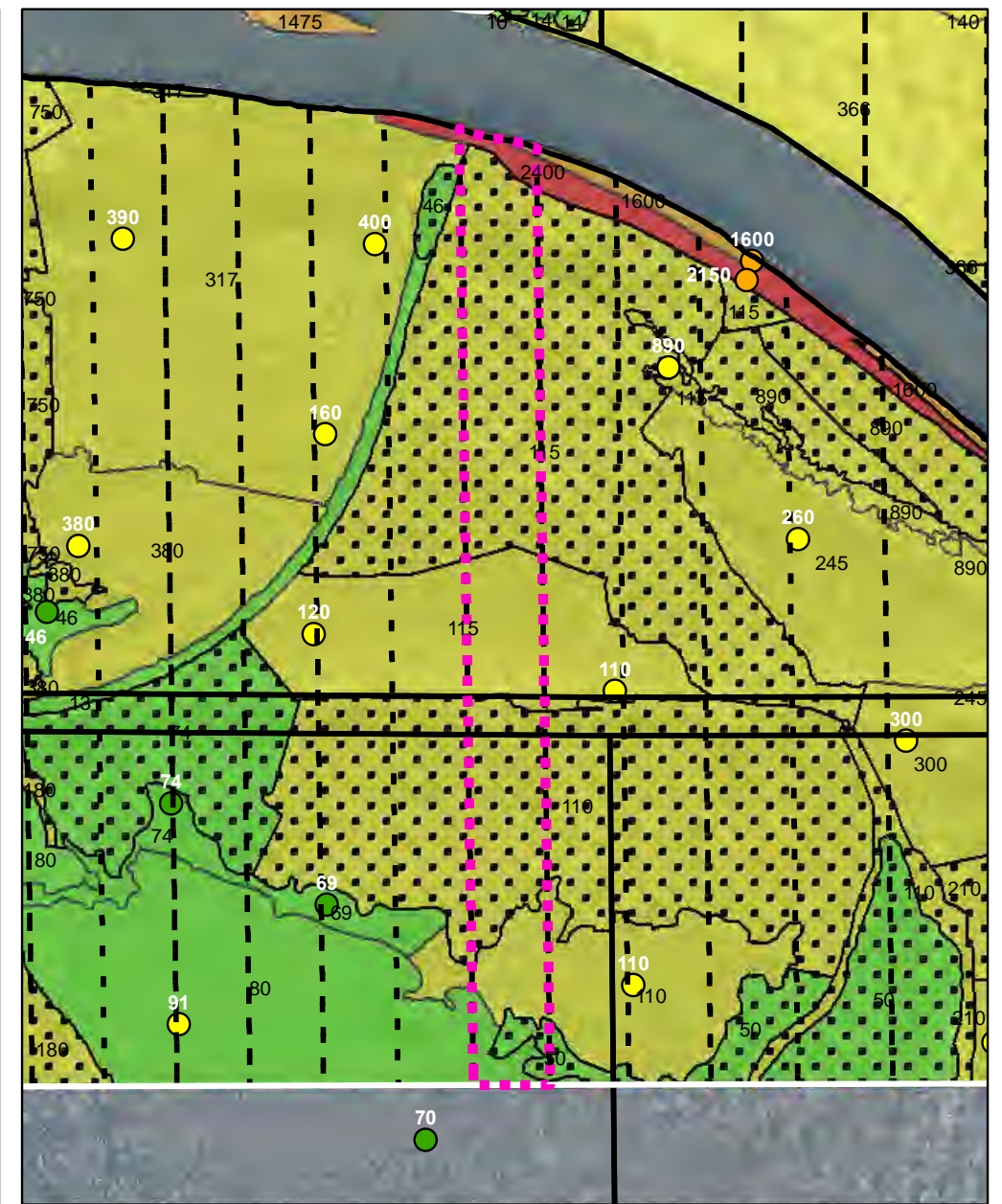
Aerial Background



Geomorphic Polygons



SAC Polygons and Existing Samples



Decision Unit ID – S7_120-123_DU16
Tittabawassee River Floodplain Post-Removal Site Control Plan
Appendix B

Figure
S7_120-
123_16

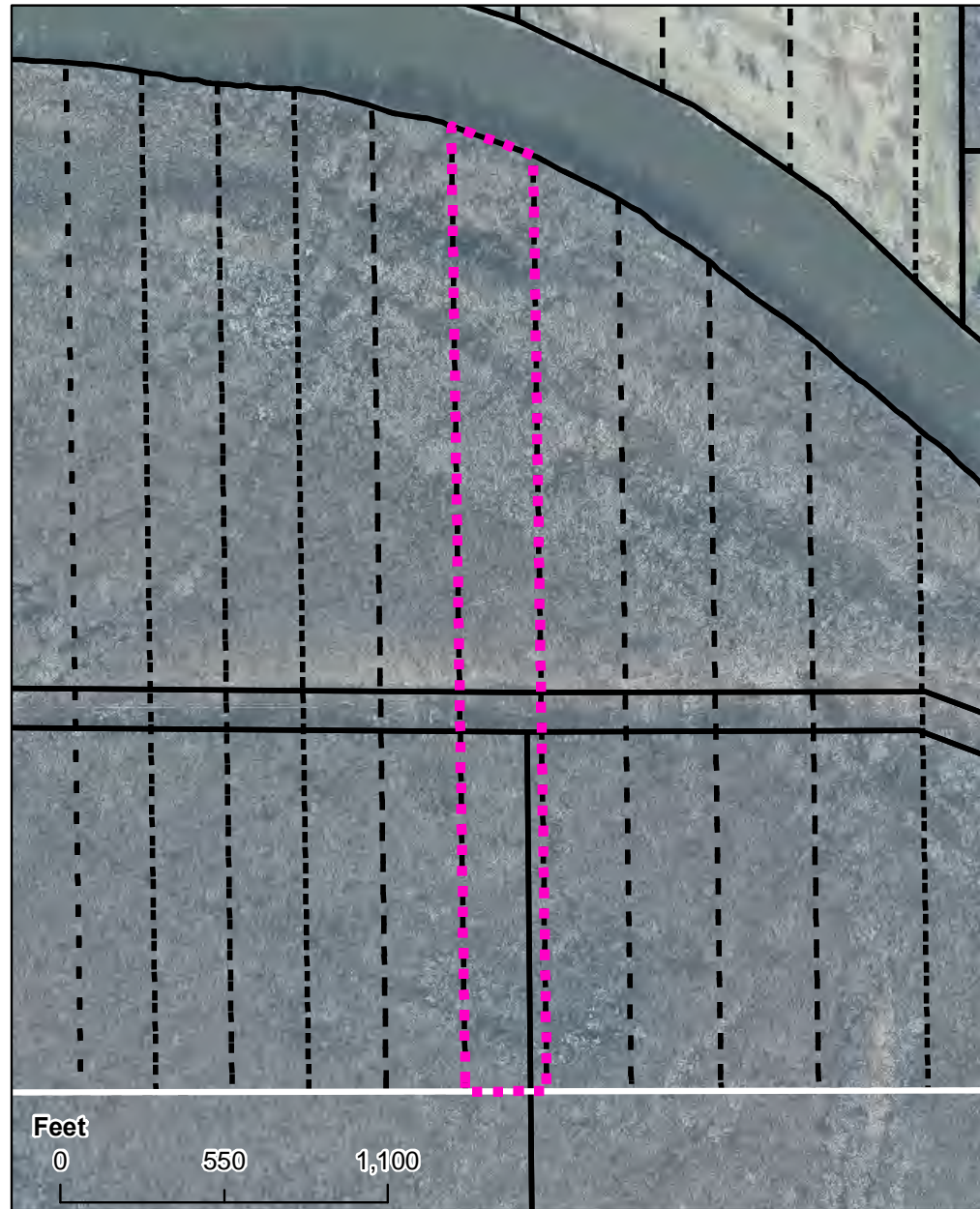
Area in 8-year Floodplain: 499.24 acres

Area of DU: 20.08 acres

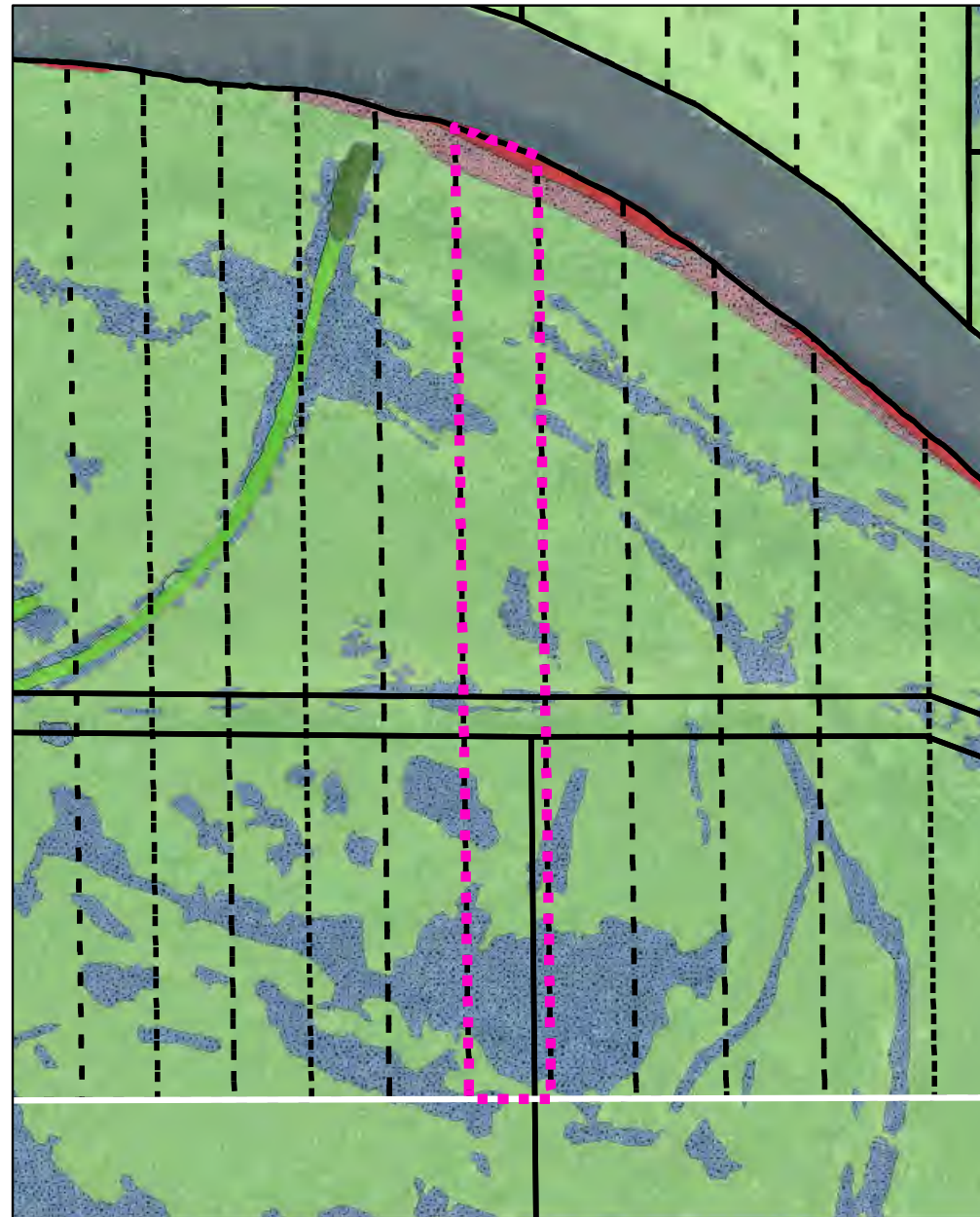
Rev 0 — July 27th, 2021

LAND USE VERIFIED

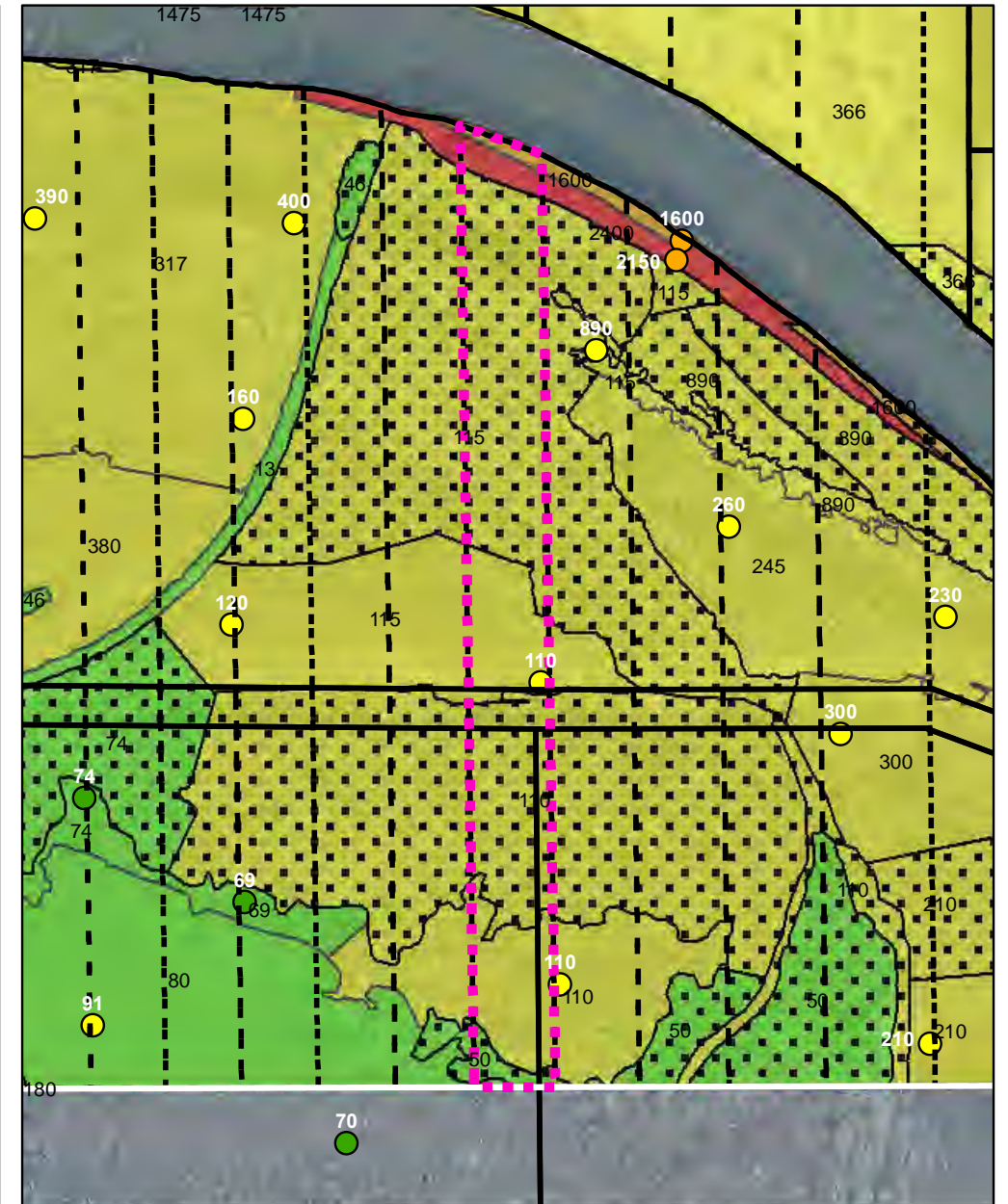
Aerial Background



Geomorphic Polygons



SAC Polygons and Existing Samples



Decision Unit ID – S7_120-123_DU17
Tittabawassee River Floodplain Post-Removal Site Control Plan
Appendix B

Figure
S7_120-
123_17

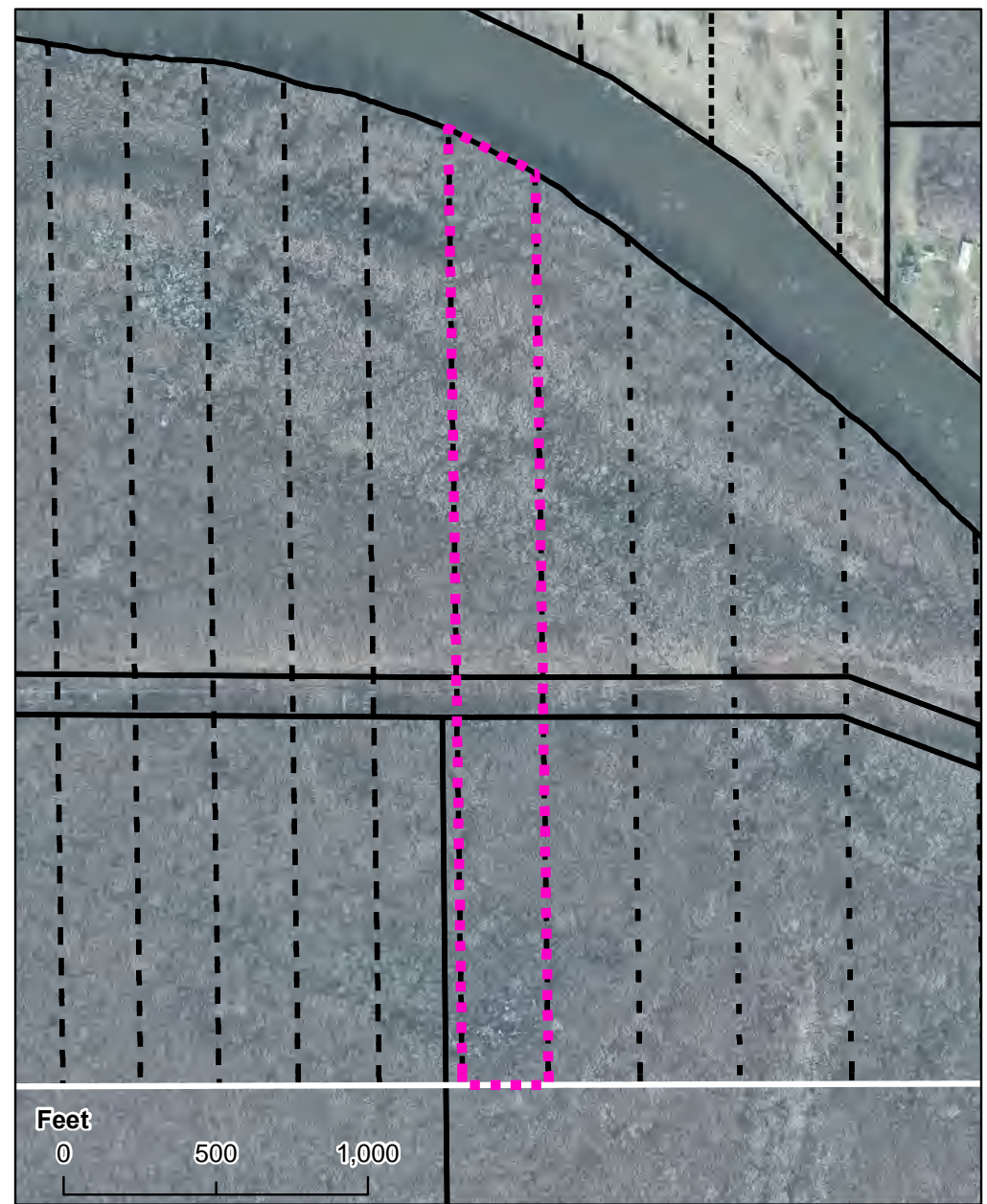
Area in 8-year Floodplain: 499.24 acres

Area of DU: 20.02 acres

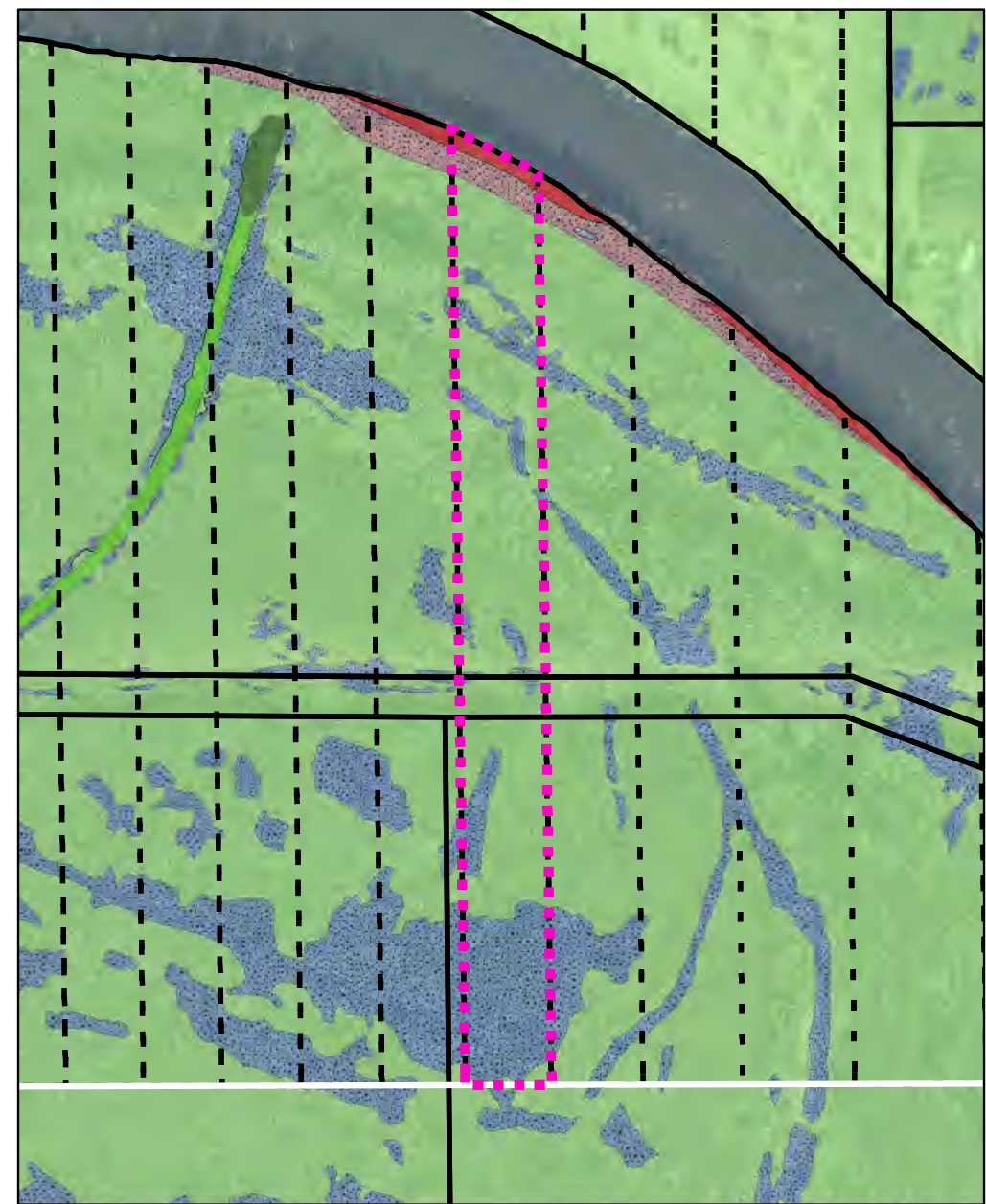
Rev 0 — July 27th, 2021

LAND USE VERIFIED

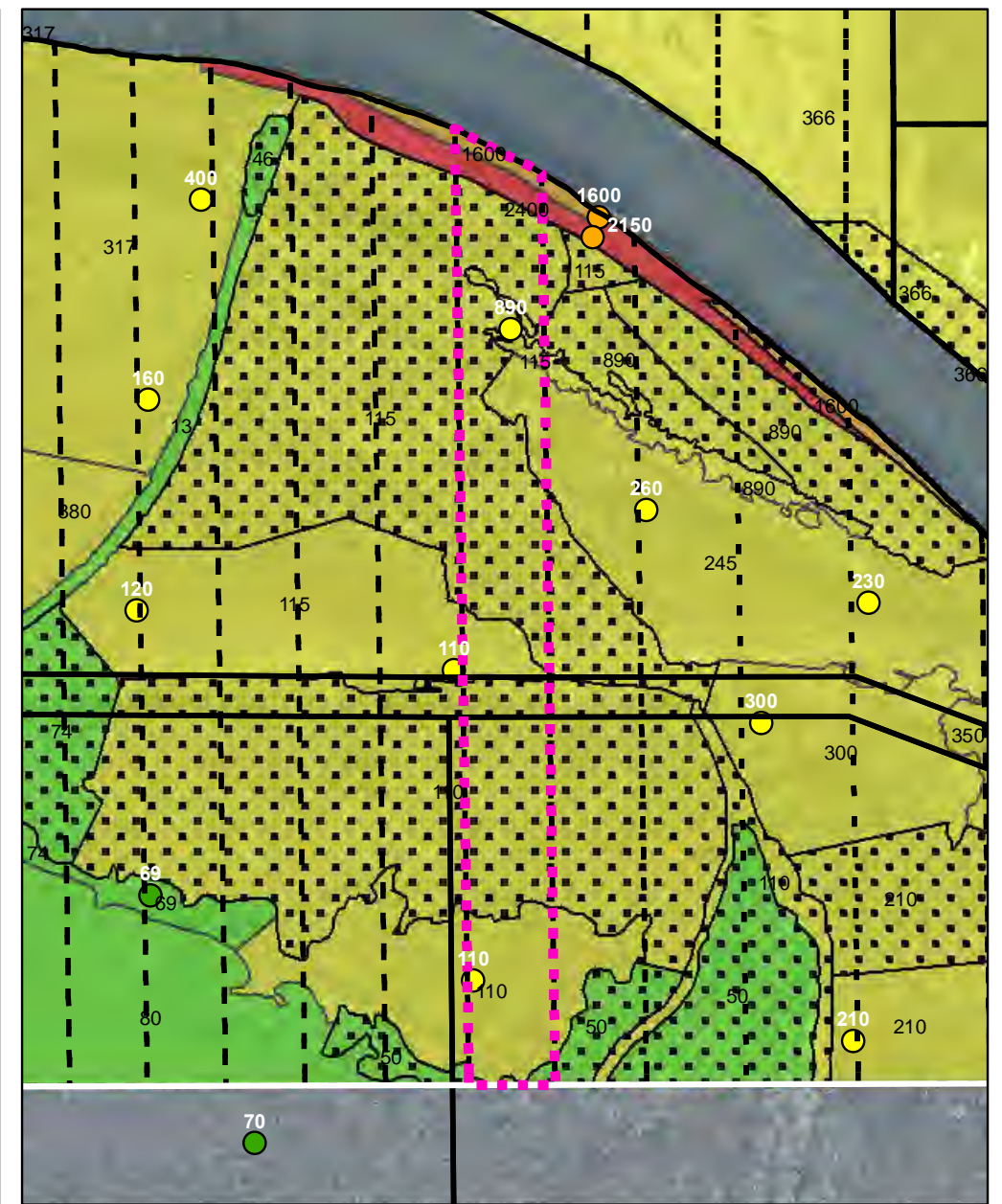
Aerial Background



Geomorphic Polygons



SAC Polygons and Existing Samples



Decision Unit ID – S7_120-123_DU18
Tittabawassee River Floodplain Post-Removal Site Control Plan
Appendix B

Figure
S7_120-
123_18

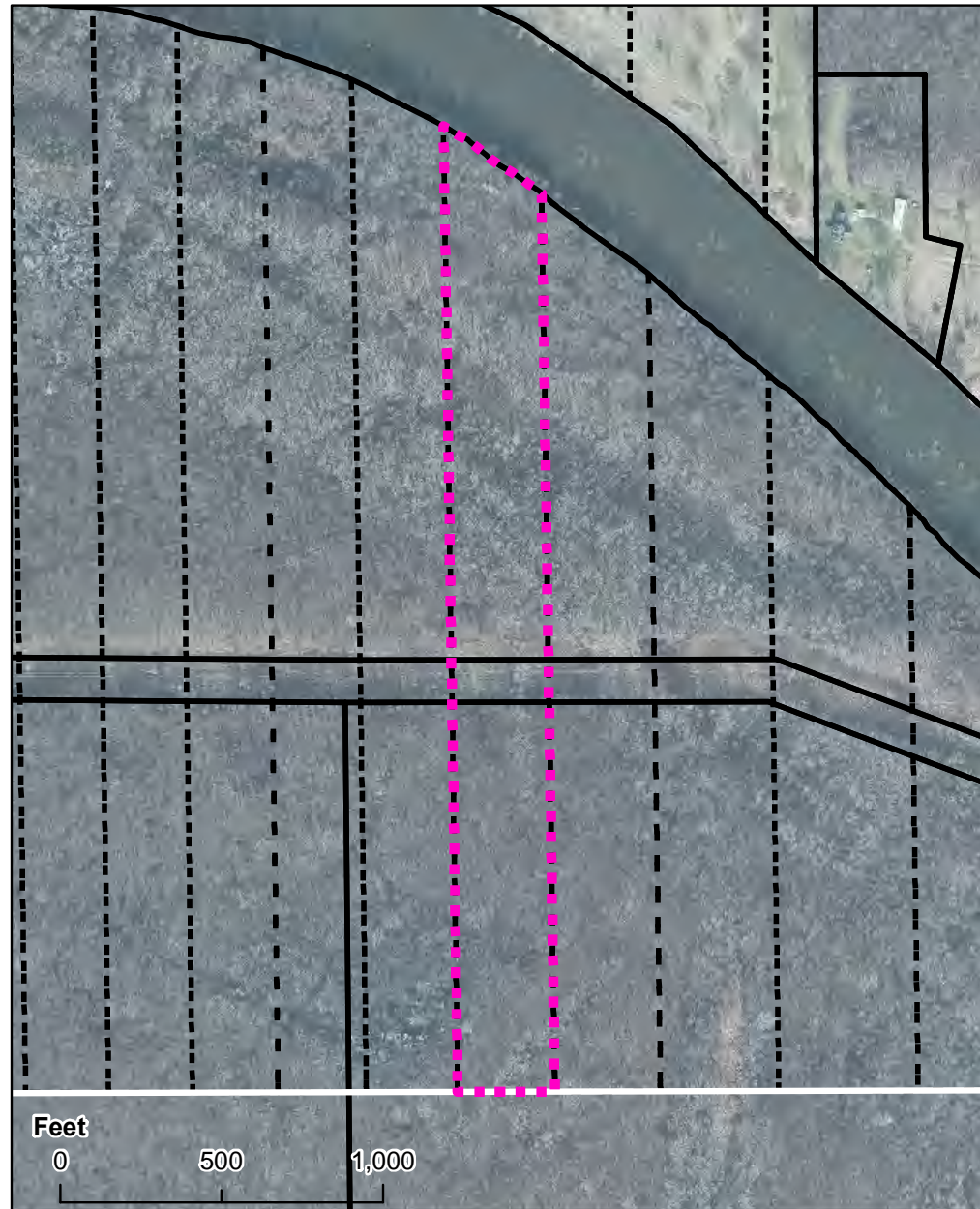
Area in 8-year Floodplain: 499.24 acres

Area of DU: 20.03 acres

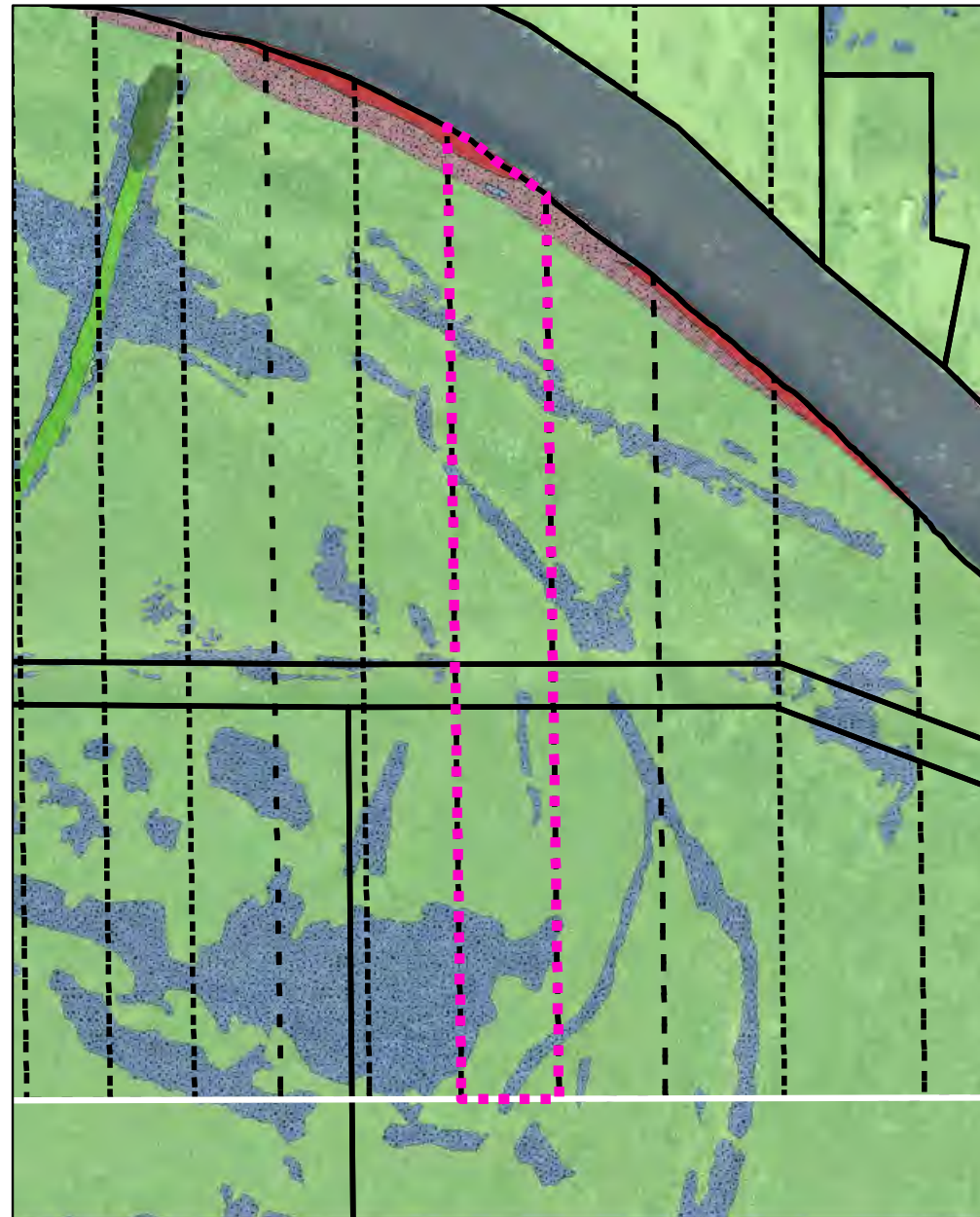
Rev 0 — July 27th, 2021

LAND USE VERIFIED

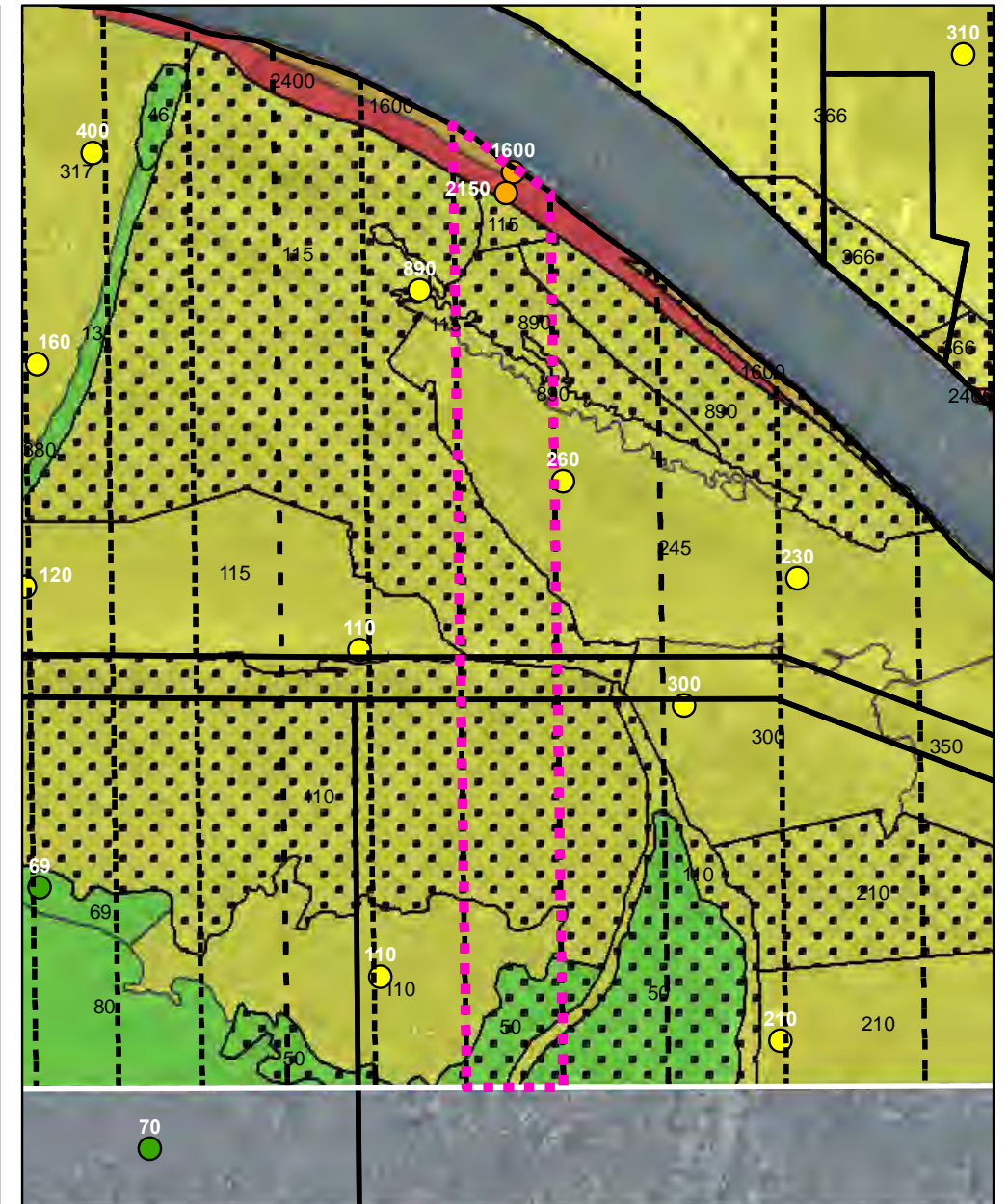
Aerial Background



Geomorphic Polygons



SAC Polygons and Existing Samples



Decision Unit ID – S7_120-123_DU19
Tittabawassee River Floodplain Post-Removal Site Control Plan
Appendix B

Figure
S7_120-
123_19

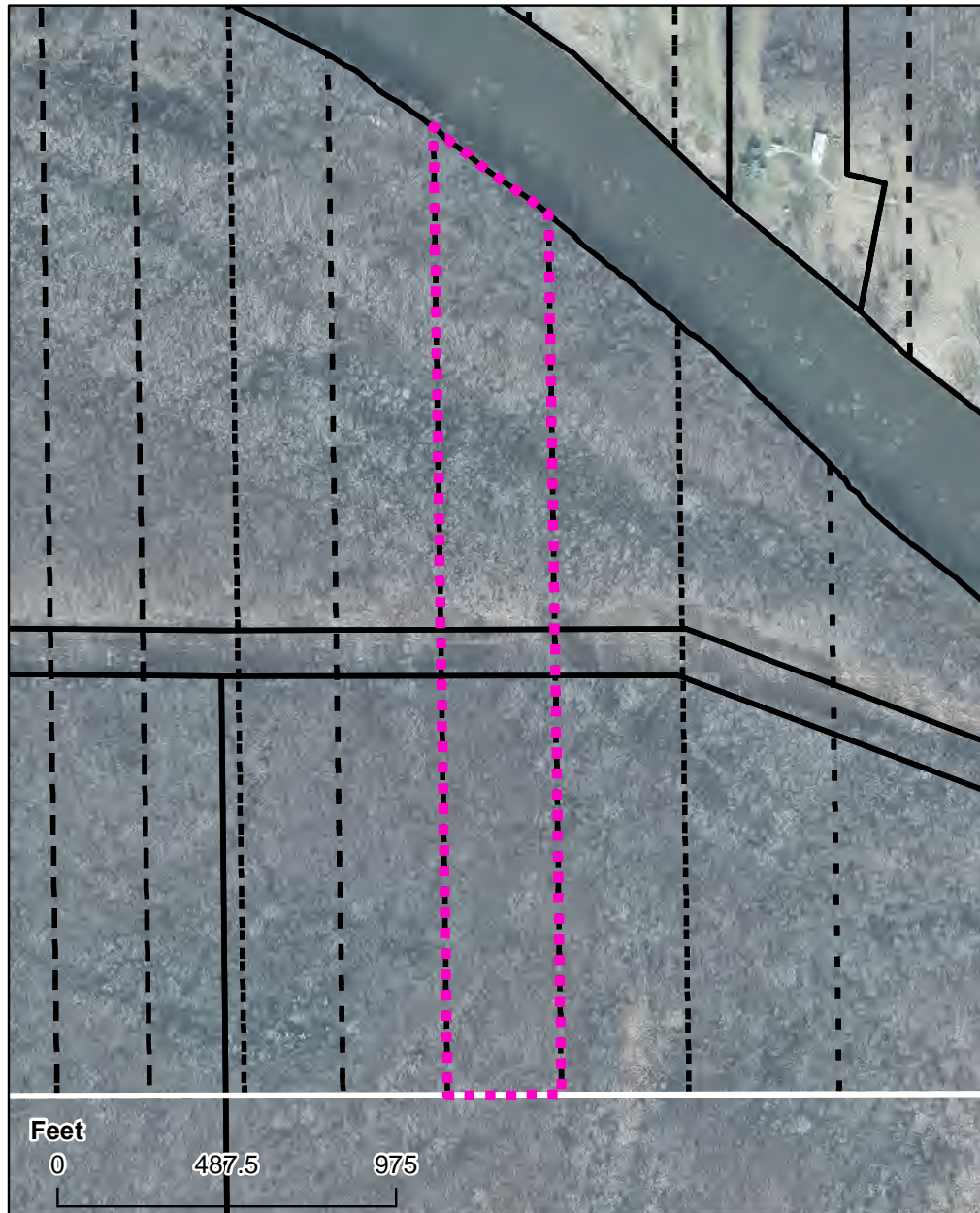
Area in 8-year Floodplain: 499.24 acres

Area of DU: 20.04 acres

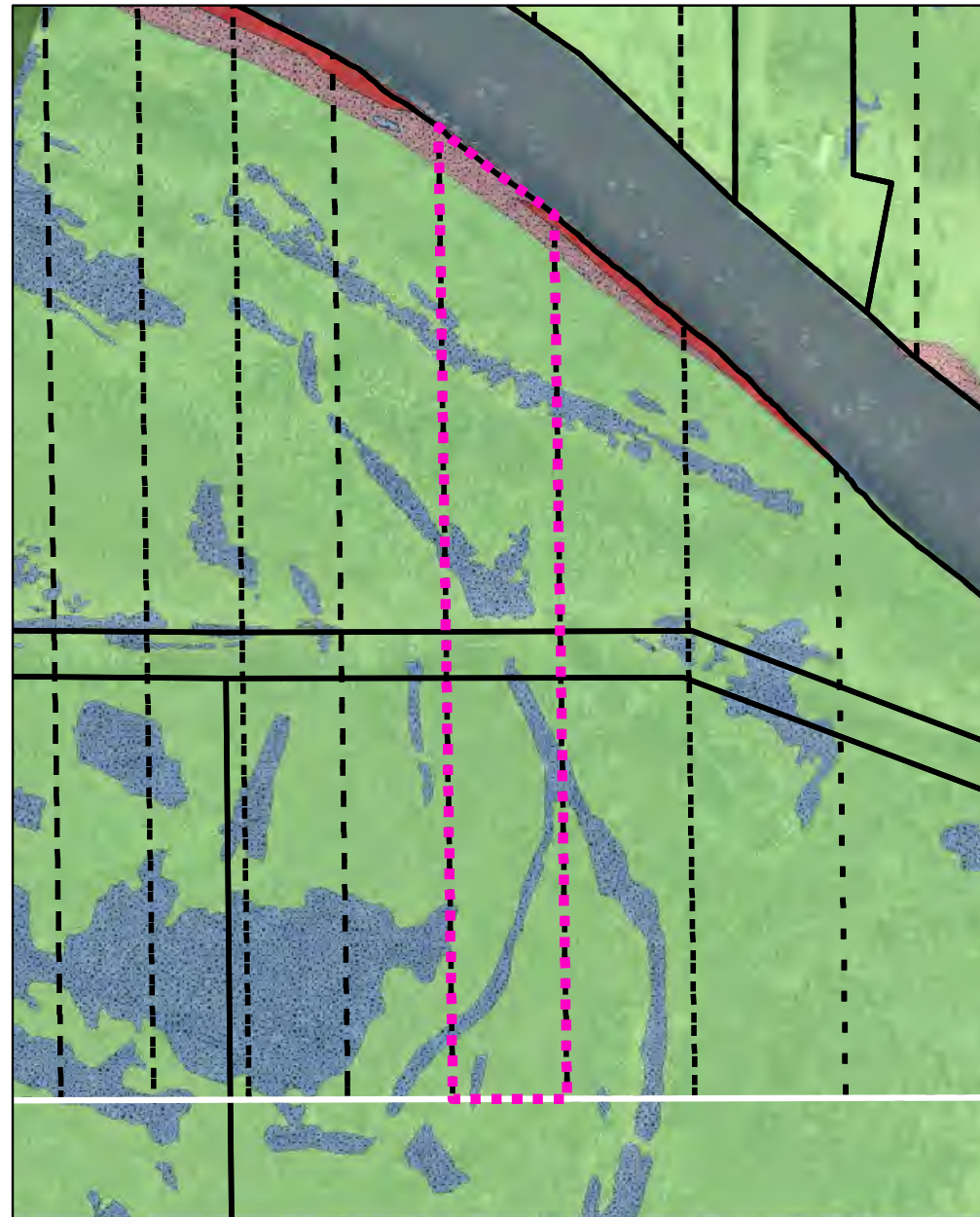
Rev 0 — July 27th, 2021

LAND USE VERIFIED

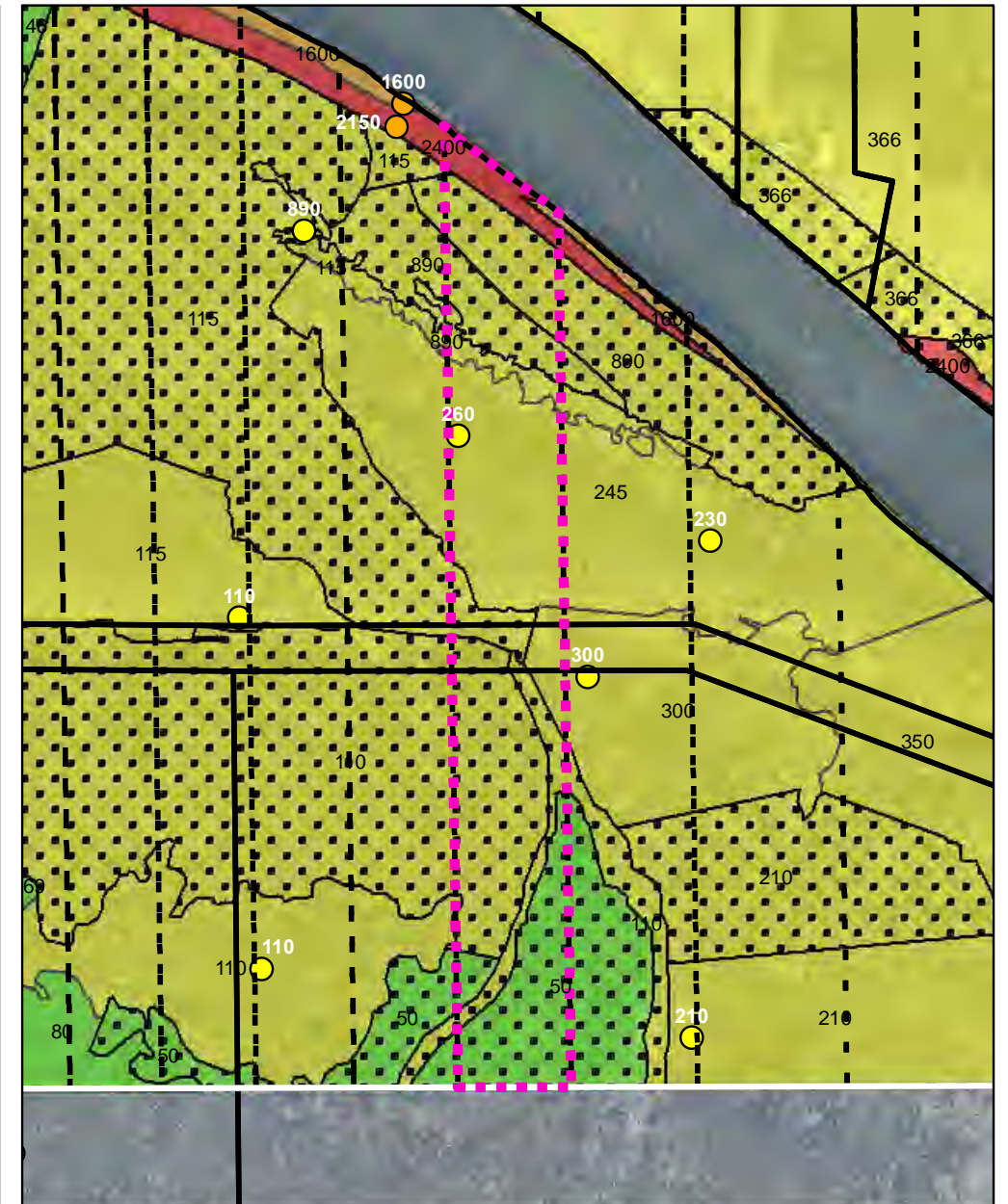
Aerial Background



Geomorphic Polygons



SAC Polygons and Existing Samples



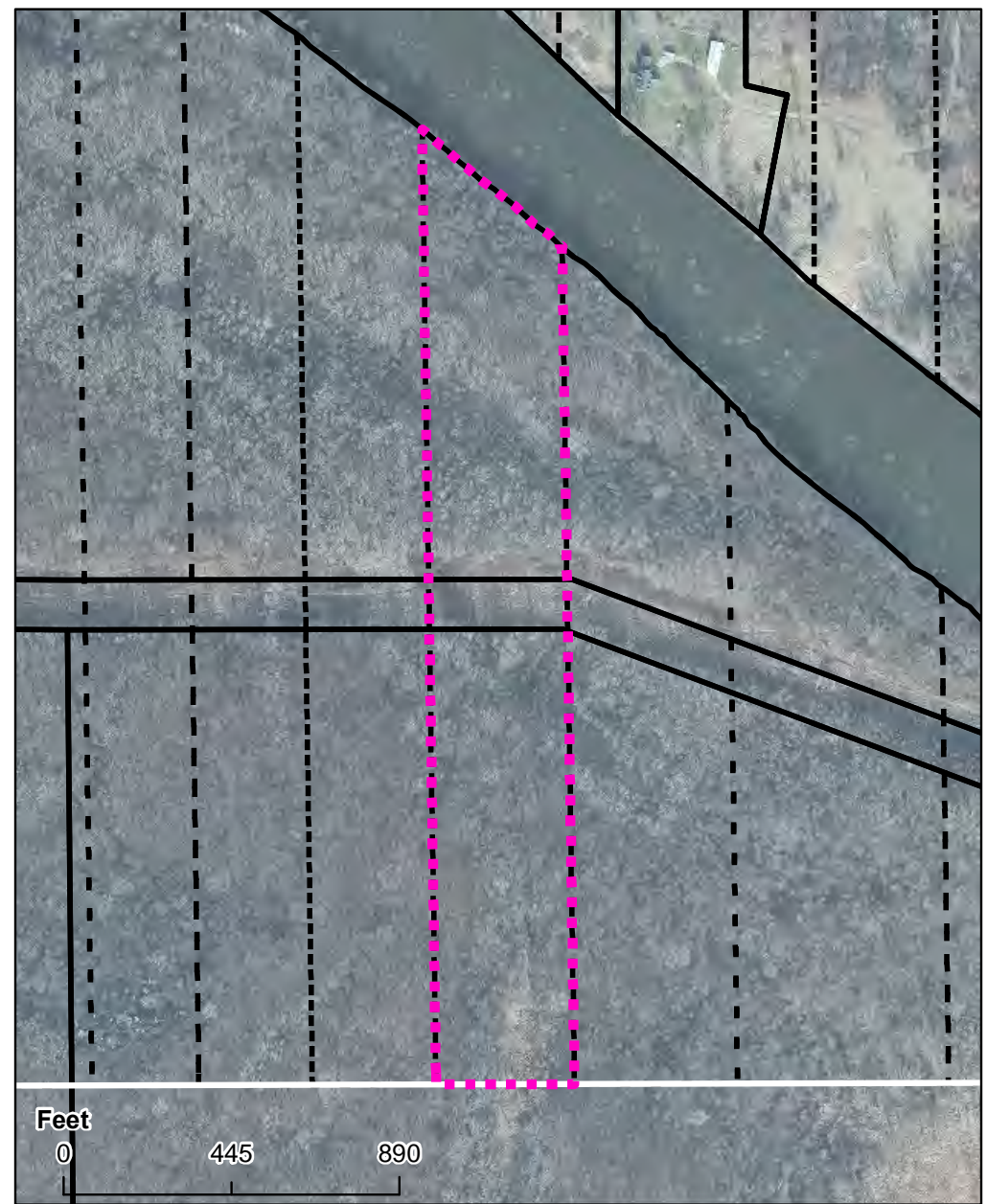
Area in 8-year Floodplain: 499.24 acres

Area of DU: 20.07 acres

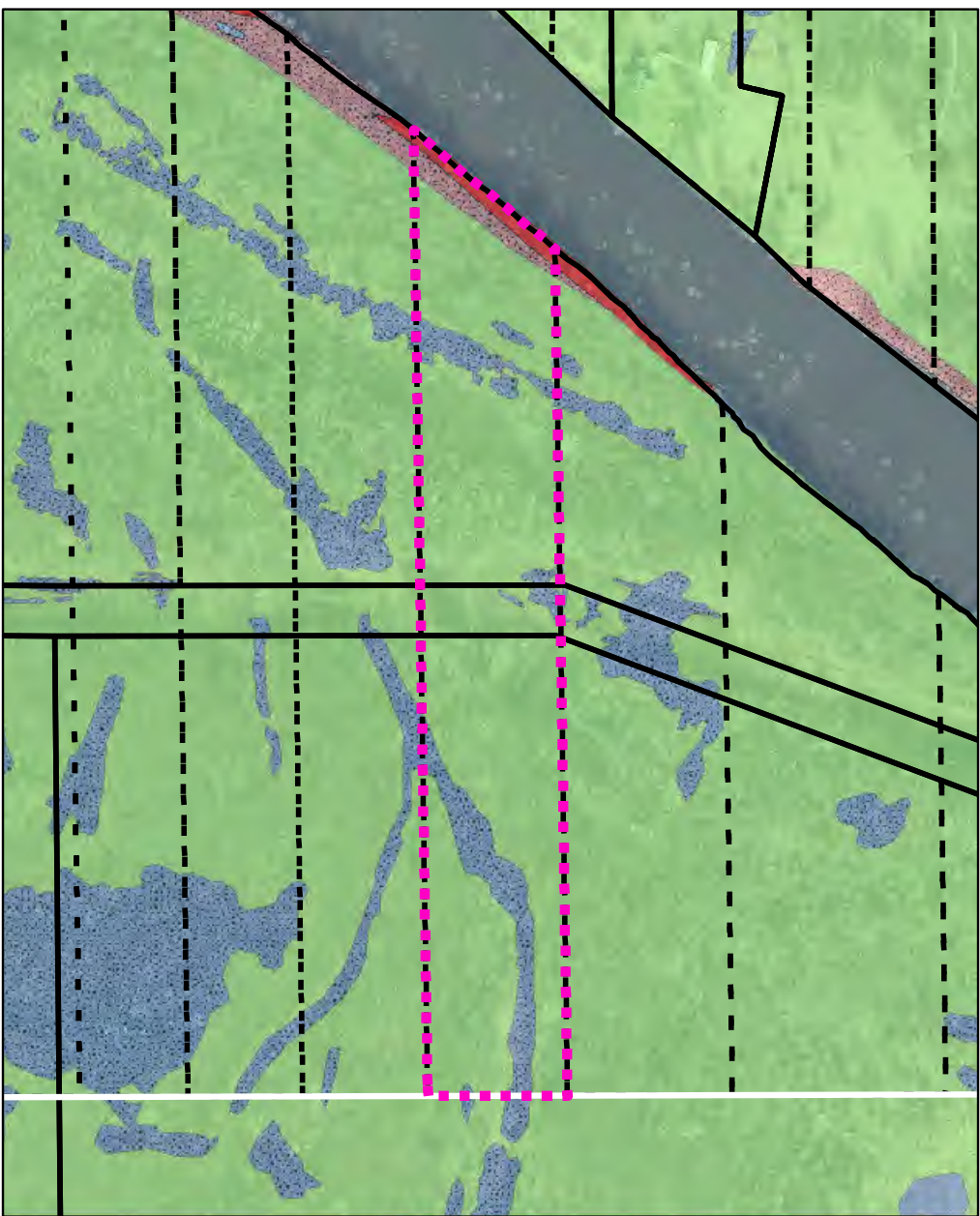
Rev 0 — July 27th, 2021

LAND USE VERIFIED

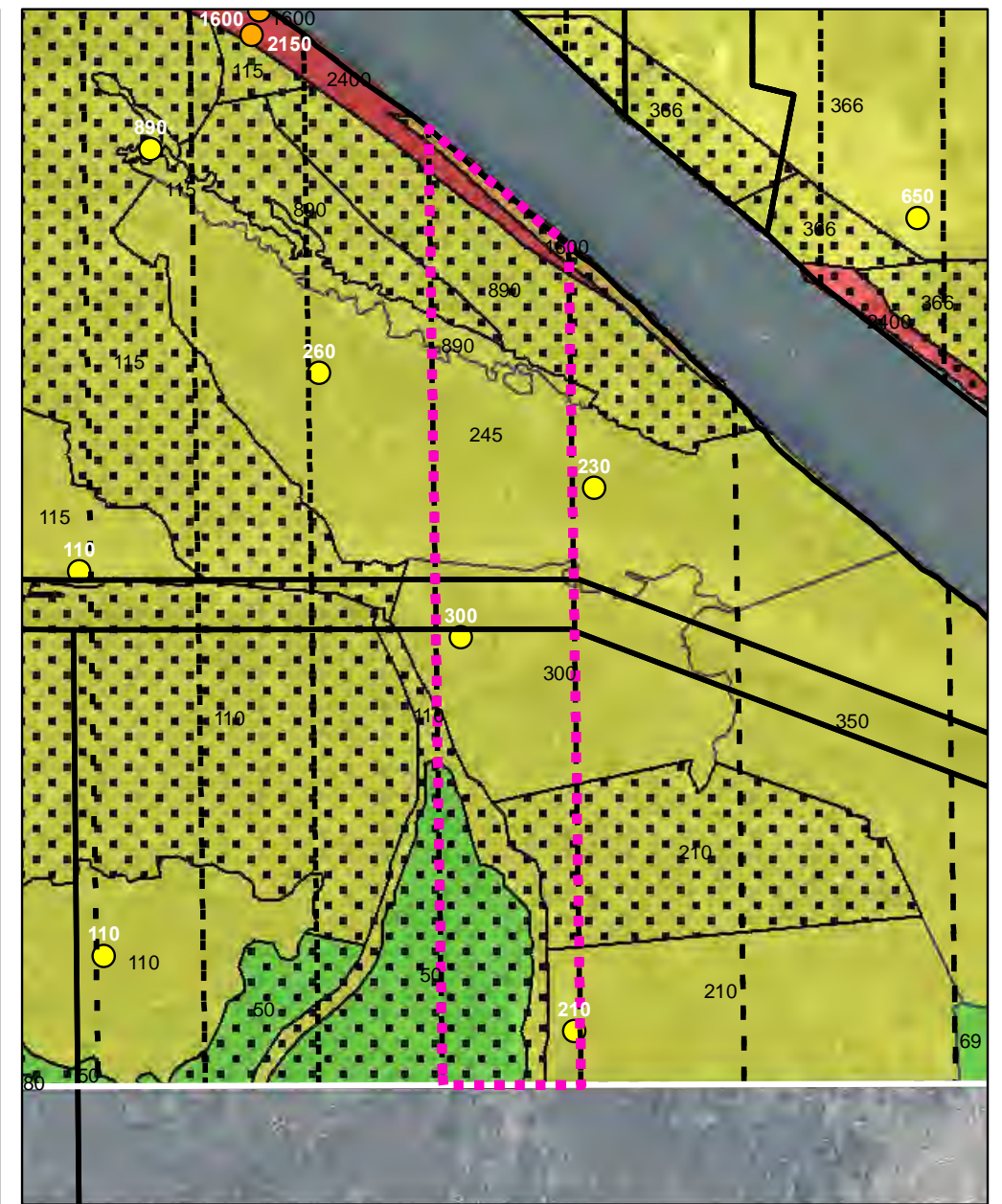
Aerial Background



Geomorphic Polygons



SAC Polygons and Existing Samples



Decision Unit ID – S7_120-123_DU21
Tittabawassee River Floodplain Post-Removal Site Control Plan
Appendix B

Figure
S7_120-
123_21

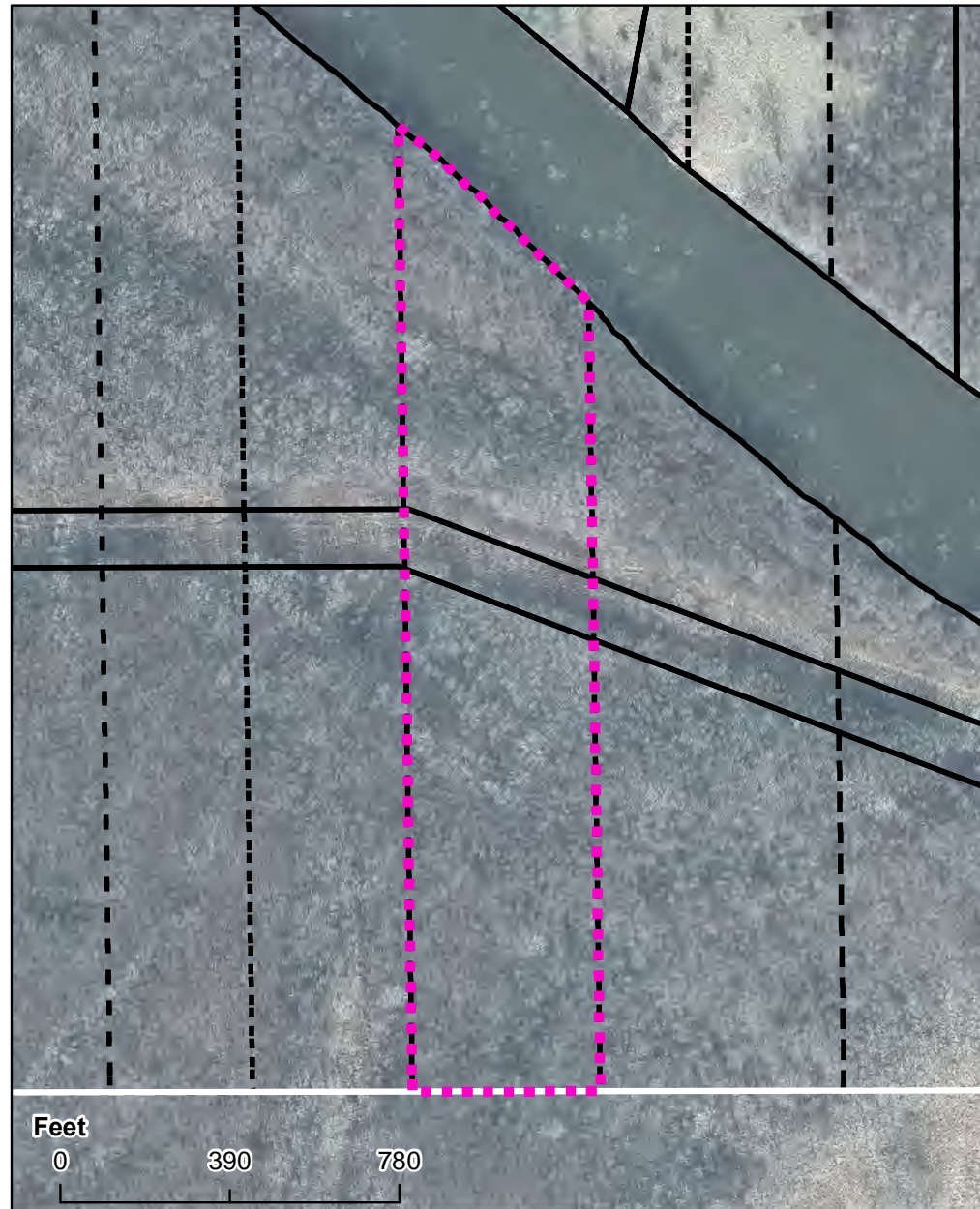
Area in 8-year Floodplain: 499.24 acres

Area of DU: 20.15 acres

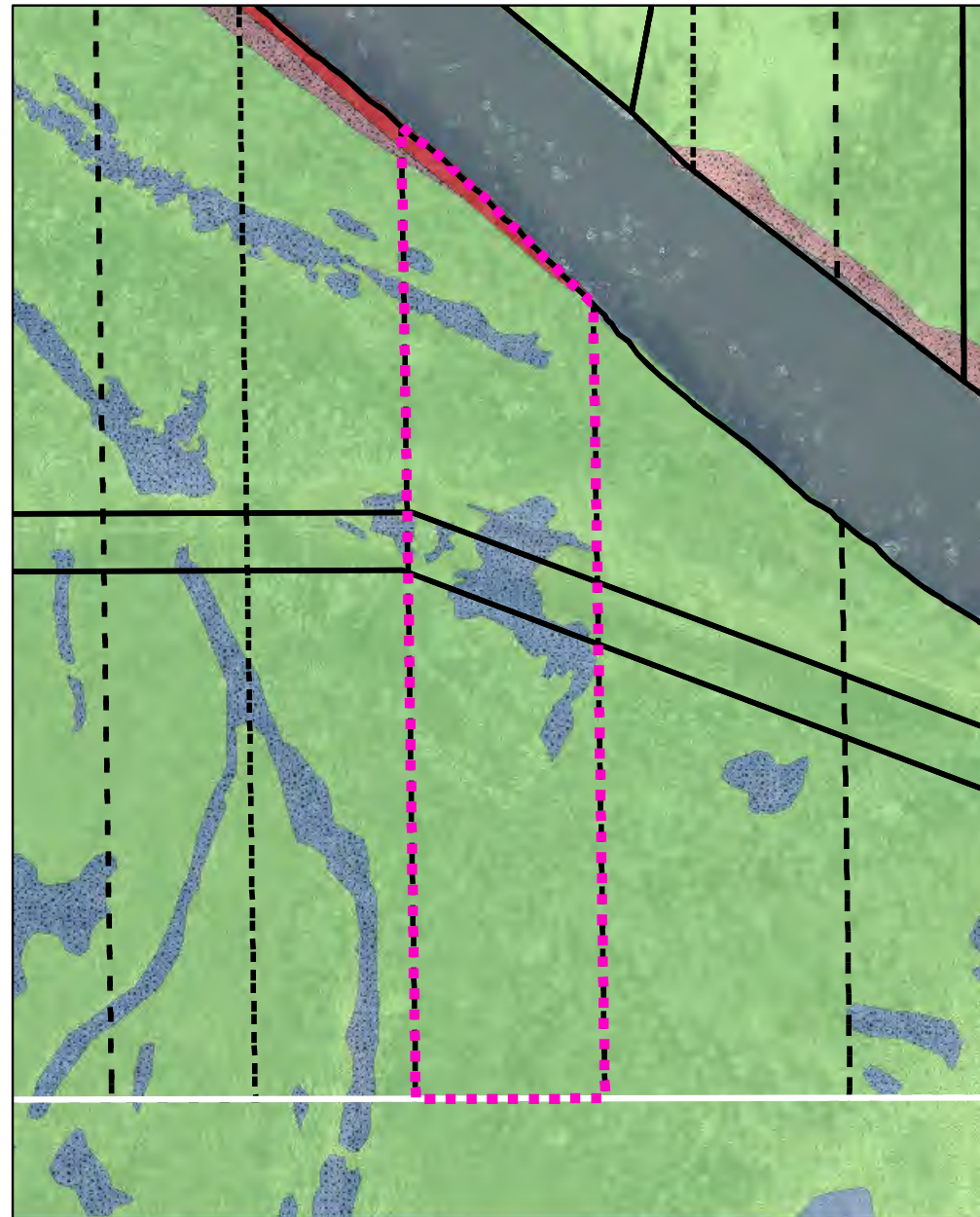
Rev 0 — July 27th, 2021

LAND USE VERIFIED

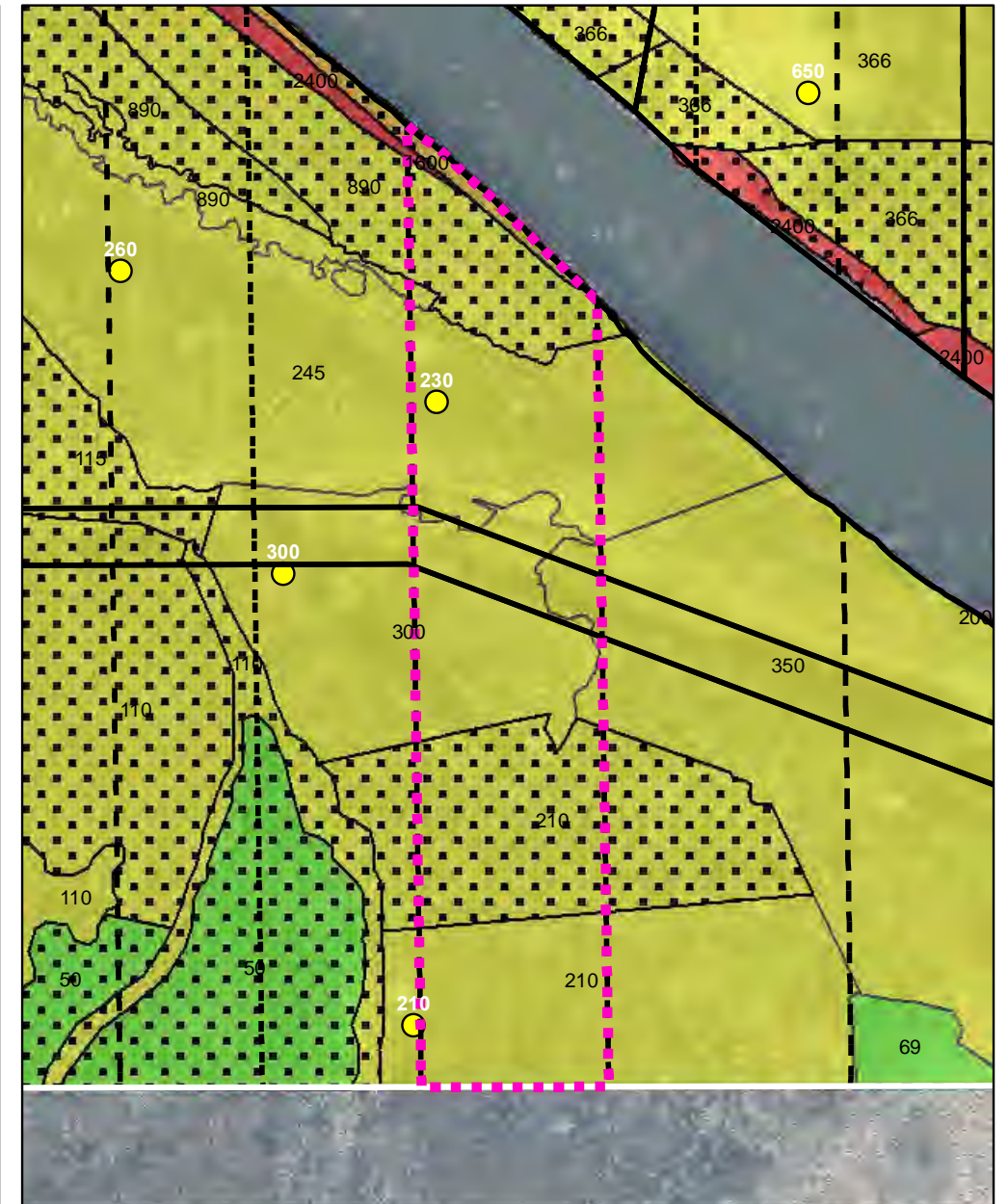
Aerial Background



Geomorphic Polygons



SAC Polygons and Existing Samples



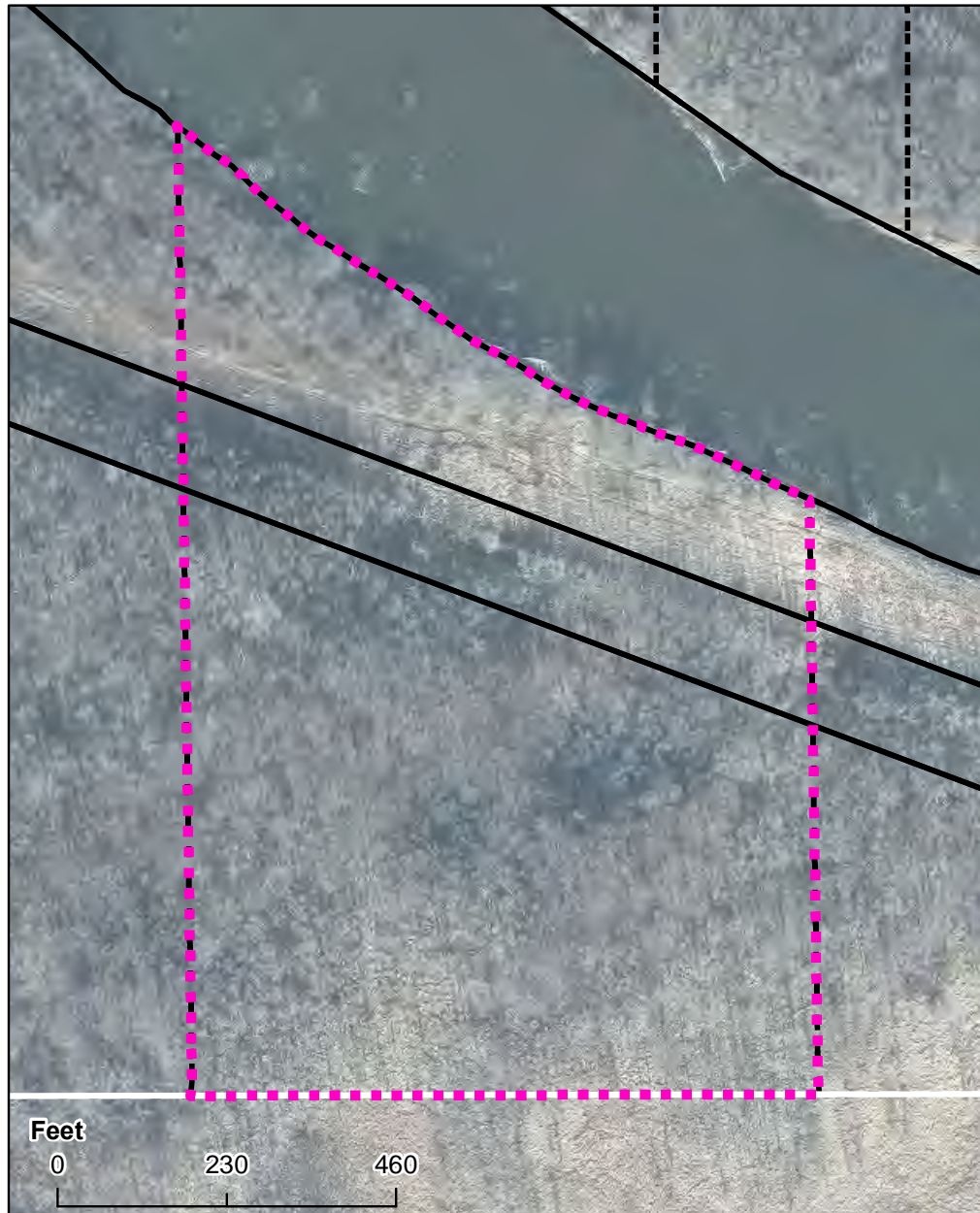
Area in 8-year Floodplain: 499.24 acres

Area of DU: 20.14 acres

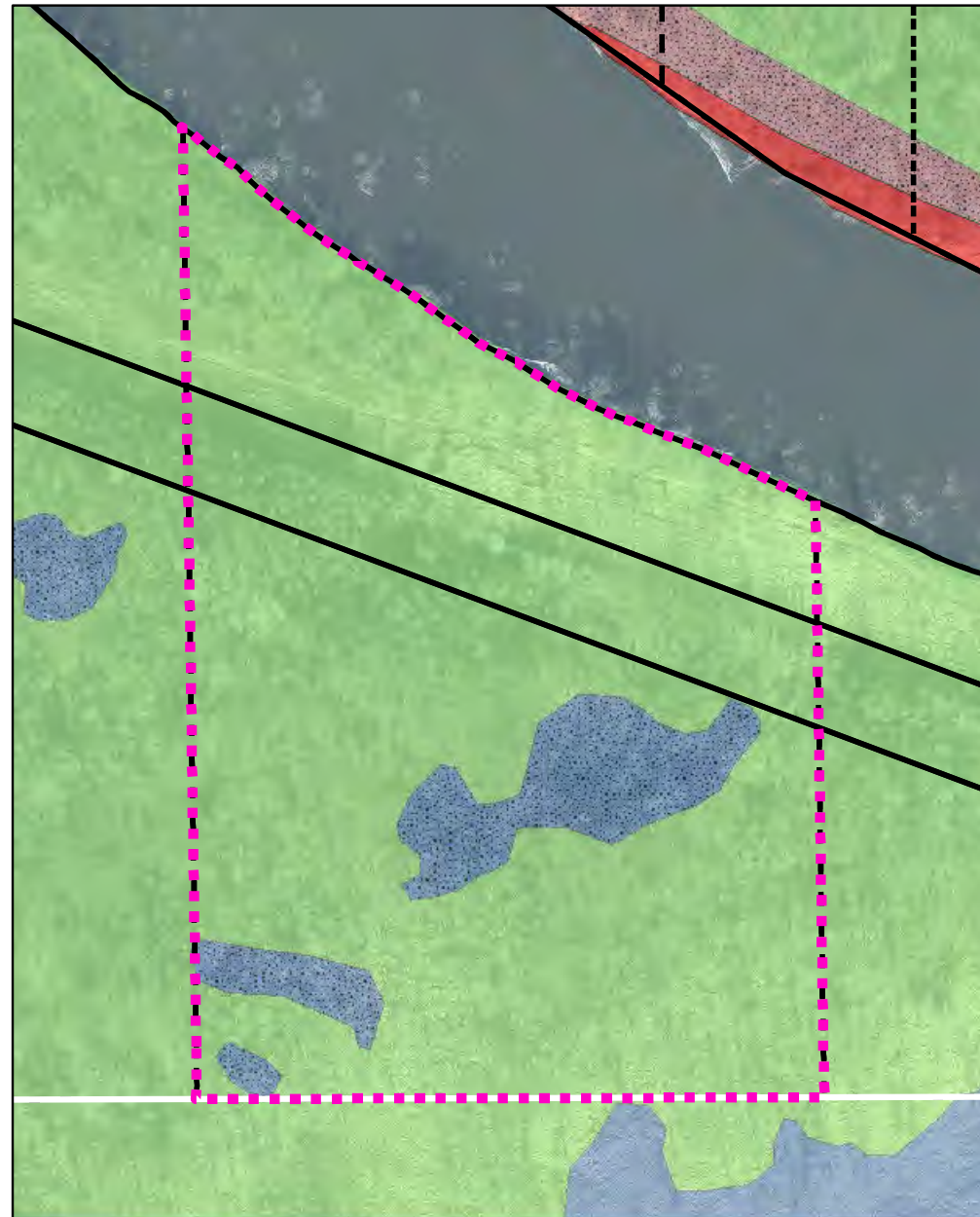
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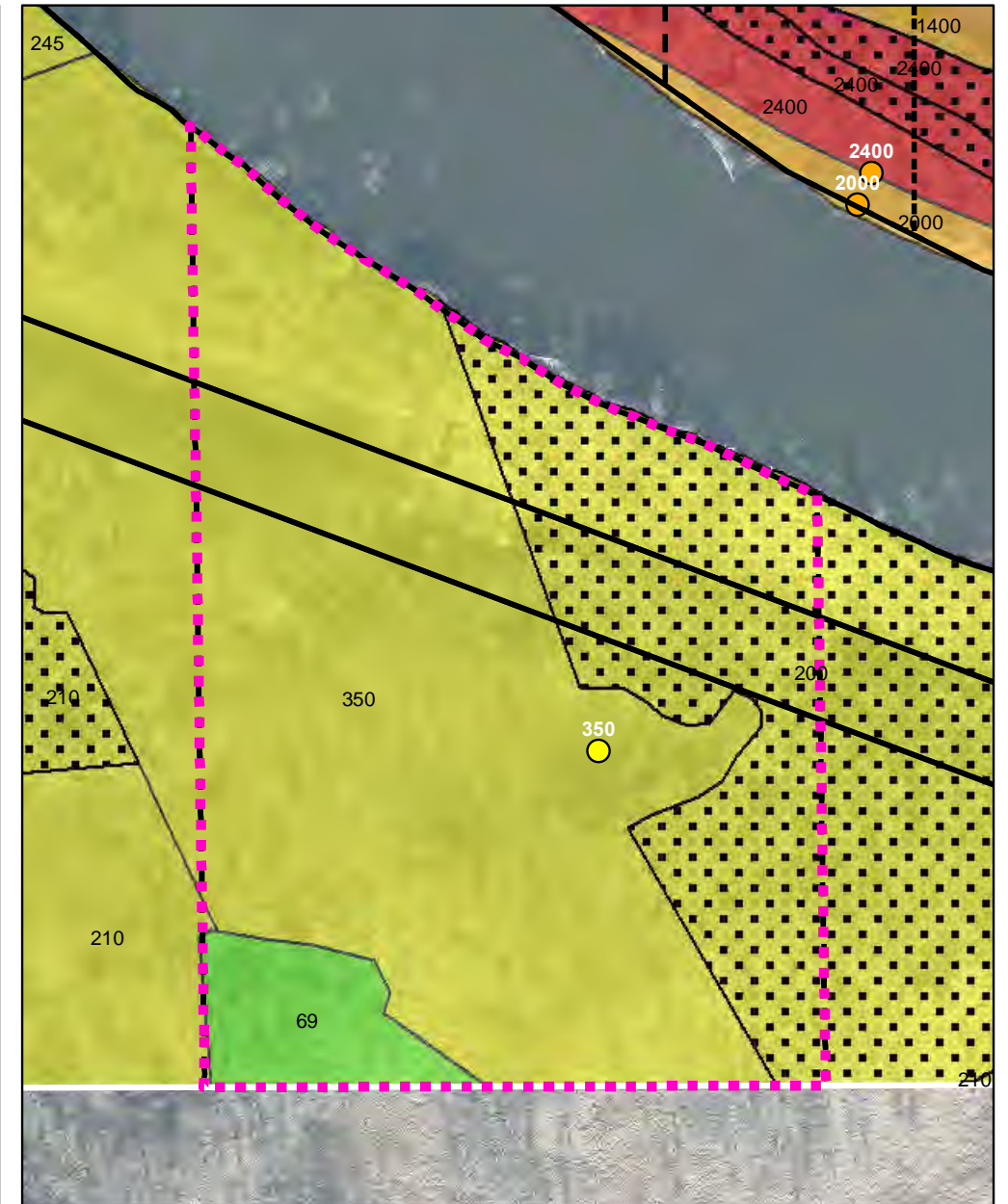
Aerial Background



Geomorphic Polygons



SAC Polygons and Existing Samples



Decision Unit ID – S7_120-123_DU24
Tittabawassee River Floodplain Post-Removal Site Control Plan
Appendix B

Figure
S7_120-
123_24

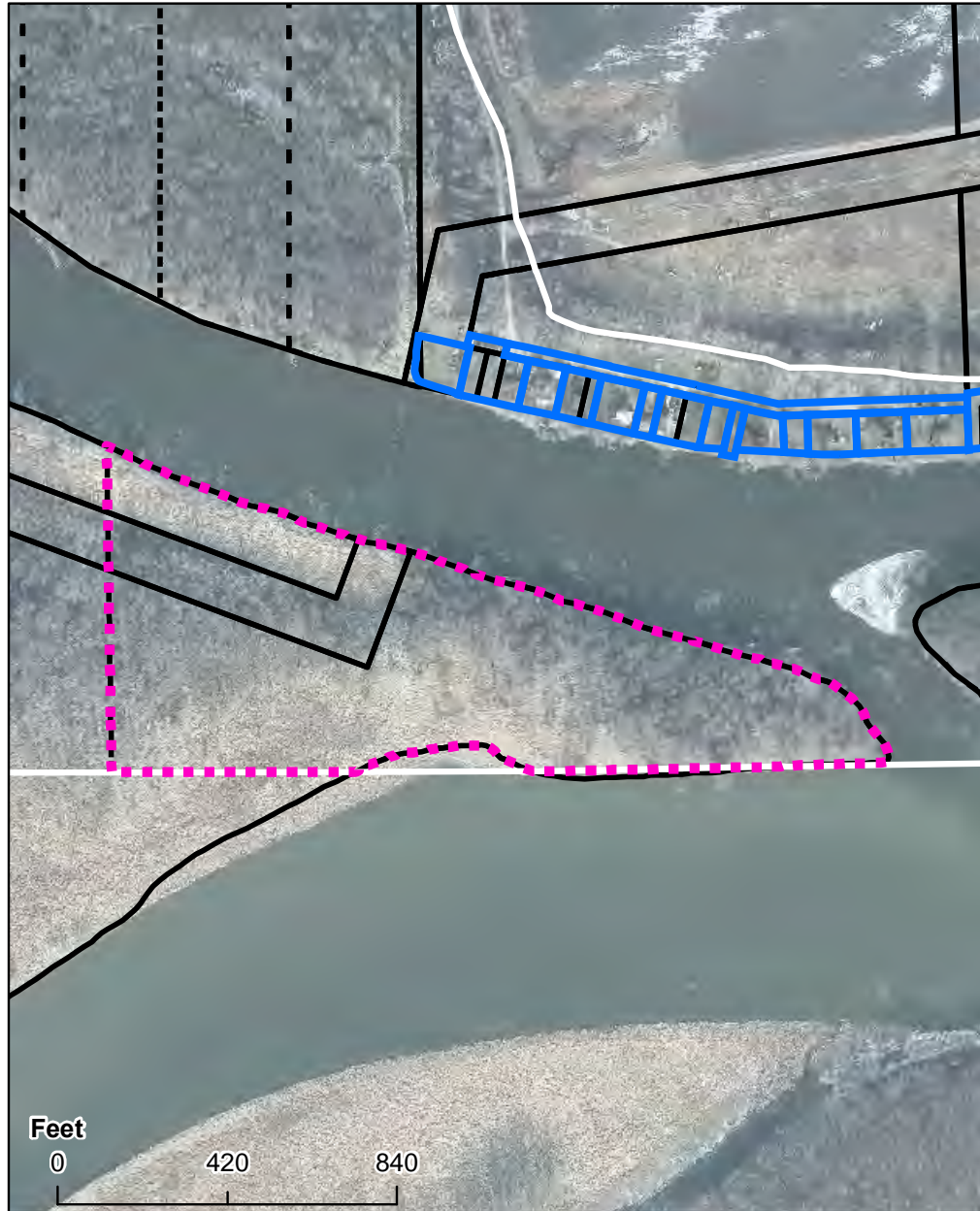
Area in 8-year Floodplain: 499.24 acres

Area of DU: 20.32 acres

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Aerial Background



Geomorphic Polygons



SAC Polygons and Existing Samples

