Permit Application

Environmental Impact Assessment

White Pine North Project

Volume IIM

Appendices E-2 through E-5

White Pine Copper LLC

White Pine, Michigan

September 2026

Project I.D.: 23W200

Solving our clients' toughest science and engineering challenges.

E-2

EGLE Wetland Identification Report

STATE OF MICHIGAN
DEPARTMENT OF
ENVIRONMENT, GREAT LAKES, AND ENERGY
WATER RESOURCES DIVISION

GRETCHEN WHITMER
GOVERNOR

PHILLIP D. ROOS
DIRECTOR

January 21, 2025

VIA EMAIL

Randall Phillips
Barr Engineering
3033 Orchard Vista Drive SE
Suite 200
Grand Rapids, Michigan 49546

Dear Randall Phillips:

SUBJECT: Wetland Identification Report
MiEnviro Site Name: 66-White Pine Copper-Carp Lake Twp
MiEnviro WIP Application Submission Number: HQ6-65JR-KA16Y

The Department of Environment, Great Lakes, and Energy's (EGLE), Water Resources Division (WRD) conducted a Level 3 Wetland Identification Program (WIP) review of an assessment area consisting of approximately 1,030 acres on property (Property Tax ID Numbers: 03 054 101 00, 03 054 201 10, 03 136 001 06, 03 031 001 00, 03 030 001 00, 03 019 002 00, 03 019 001 00, 03 019 003 00, 03 020 001 00, 03 017 001 10, 03 016 002 00, 03 021 001 00, 03 015 002 00, 03 022 002 00, 03 027 002 00) located in Town 51N, Range 41W, Sections: 15,16,17,19,20,21,22,27,30,31; and Town 51N, Range 42W, Sections: 24,25,36 ; Carp Lake Township (Figures 1 and 2) during September 11 and 12, 2024. The review was conducted in accordance with Part 303, Wetlands Protection, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (NREPA); and Rule 4(1), Wetland Identification and Assessment (R 281.924), of the Administrative Rules for Part 303. This is a report of our findings in response to your WIP application.

Staff from the WRD reviewed pertinent information such as historical aerial imagery, topographic mapping data, soils survey data, and surface hydrology data. The on-site investigation was conducted with your wetland consultant present and included a review of plants, hydrology, and soils.

Staff confirm most of the wetland boundary lines delineated by your consultant. Several relatively small wetland areas scattered throughout the WIP site were overlooked and omitted by the consultant. Evidence showed that the areas exhibit wetland hydrology during a typical growing season.

Table 1 and the site maps (Figures: 1, 2, and 3a through 3k) of the WIP assessment area were created by combining information from your consultant and the WRD. The new table and maps identify areas containing regulated wetland, unregulated wetland, and non-wetland (upland).

The vast majority (i.e., 242 acres) of total wetland acreage (i.e., 272 acres) on site is regulated by the WRD because of wetland size and/or contiguity to a pond, lake, or stream.

For the areas identified as regulated wetland on site (Table 1; Figures: 2, 3a through 3k) please be advised that any of the following activities require a permit under Part 303:

a) Deposit or permit the placing of fill material in a regulated wetland.
b) Dredge, remove, or permit the removal of soil or minerals from regulated wetland.
c) Construct, operate, or maintain any use or development in a regulated wetland.
d) Drain surface water from a regulated wetland.

For those areas identified as unregulated wetlands and non-wetland (upland) on the site maps (Figures: 2, 3a through 3k) and Table 1, the WRD lacks jurisdiction under Part 303 for activities occurring there. Most of the unregulated wetlands are not regulated by the WRD because they are not contiguous to the Great Lakes, an inland lake or pond, or a river or stream; and are less than five acres in size. Four relatively large wetlands on site are unregulated because they were incidentally created as part of construction and operation of water treatment ponds, lagoons, or storm water facilities in compliance with the requirements of state or federal water pollution control laws.

This Wetland Identification Report is limited to findings pursuant to Part 303 and does not constitute a determination of jurisdiction under other programs administered by EGLE. Any land use activities undertaken within the assessment area may be subject to regulation pursuant to the NREPA under the following programs:

Part 91, Soil Erosion and Sedimentation Control
Part 301, Inland Lakes and Streams
Floodplain Regulatory Authority found in Part 31, Water Resources Protection

Please be aware that this Wetland Identification Report does not constitute a determination of the jurisdiction under local ordinances or federal law. The United States Army Corps of Engineers (USACE) retains regulatory authority over certain wetlands pursuant to Section 404 of the federal Clean Water Act (CWA), and specifically those wetlands associated with traditionally navigable waters of the state. Navigable waters are generally the Great Lakes, their connecting waters, and river systems and lakes connected to these waters. In other areas of the state, the WRD is responsible for identification of wetland boundaries for purposes of compliance with the CWA under an agreement with the United States Environmental Protection Agency. Your assessment area may be within those areas also regulated by the USACE. Additional information may be obtained by contacting the USACE at 313-226-2218.

You may request the WRD reassess the wetland boundaries and regulatory status of wetlands within any portion of the assessment area, should you disagree with the findings, within 60 days of the date of this report. A written request to reassess the Wetland Identification assessment area must be accompanied by supporting evidence with regard to wetland vegetation, soils, or hydrology that are different from, or in addition to, the information relied upon by WRD staff in preparing this report. The request should be submitted to:

Wetland Identification Program
Department of Environment, Great Lakes, and Energy
Water Resources Division
P.O. Box 30458
Lansing, Michigan 48909-7958

Please use the MiEnviro submission number assigned to this project site if submitting a permit application or otherwise corresponding with our office.

The findings contained in this report do not convey, provide, or otherwise imply approval of any governing act, ordinance, or regulation, nor does it waive the obligation to acquire any applicable federal, state, county, or local approvals. This Wetland Identification Report is not a permit for any activity that requires a permit from EGLE.

The findings contained in this report are binding on EGLE until January 21, 2028, a period of three years from the date of this Wetland Identification Report unless a reassessment has been conducted. Please contact me at GyekisK@Michigan.gov; 517-243-5002; or EGLE, P.O. Box 30458, Lansing, Michigan 48909-7958, if you have any questions regarding this report.

Sincerely,

Keto Gyekis
Wetland Identification Program Coordinator
Water Resources Division

Enclosures
cc: Carp Lake Township Clerk
U.S. Army Corps of Engineers
Ontonagon County Soil Erosion Enforcement Agent (CEA)
Ontonagon County Health Department
Timothy Greenleaf, Barr Engineering
Amanda Zeidler, White Pine Copper LLC
Ryan McCone, EGLE
Kayla Conklin, EGLE
Linda Hansen, EGLE

Table 1: WIP Assessment Summary ~ WIP - HQ6-65JR-KA16Y

Wetland Name	EGLE Regulated	Acreage (on site)
1	NO	7.34
2	YES	0.05
3	YES	22.24
4	YES	0.02
5	YES	0.09
6	YES	0.40
7	YES	0.07
8	YES	0.03
9	YES	0.05
10	YES	0.02
11	YES	4.77
12	YES	0.08
13	YES	0.21
14	YES	0.05
15	YES	0.05
16	YES	0.02
17	YES	0.03
18	YES	0.02
19	YES	0.05
20	YES	0.11
21	YES	0.02
22	YES	0.07
23	YES	0.02
24	YES	0.03
25	YES	0.32
26	YES	0.08
27	YES	0.01
28	YES	0.02
29	NO	0.04
30	YES	0.16
31	YES	0.02
32	YES	0.02
33	NO	0.06
34	YES	0.00
35	YES	0.03
36	YES	0.01
37	YES	0.13
38	YES	0.01
39	YES	0.05
40	YES	0.04
41	YES	0.03
42	YES	0.04
43	YES	0.01
44	YES	0.05
45	YES	0.03
46	YES	0.04
47	YES	0.68
48	YES	0.18
49	YES	0.00
50	YES	0.10
51	YES	0.01
52	YES	0.17
53	YES	0.02
54	YES	14.00
55	YES	0.07
56	YES	0.04
57	YES	0.05
58	YES	0.02
59	NO	0.01
60	YES	0.10
61	NO	0.01
62	YES	0.01
63	YES	0.02
64	YES	0.06
65	YES	0.09
66	YES	0.03
67	YES	0.07
68	YES	0.29
69	YES	12.48
70	YES	0.01
71	YES	0.03
72	YES	0.07
73	YES	0.15
74	YES	0.06
75	YES	0.25
76	YES	0.02
77	NO	0.04
78	YES	0.04
79	YES	30.98
80	YES	0.01
81	YES	0.08
82	YES	0.01
83	YES	0.02
84	YES	0.02
85	YES	0.02
86	YES	0.06
87	YES	0.02
88	YES	2.26
89	YES	0.04
90	YES	0.09
91	YES	57.65
92	YES	0.01
93	YES	0.04
94	YES	0.05
95	YES	0.04
96	YES	0.09
97	YES	0.02
98	NO	0.04
99	YES	0.04
100	NO	0.02
101	YES	0.04
102	NO	0.11
103	YES	0.02
104	NO	0.03
105	YES	0.03
106	NO	0.04
107	YES	0.01
108	NO	0.02
109	YES	0.01
110	YES	0.02
111	YES	0.02
113	YES	0.03
114	YES	5.19
115	YES	0.05
116-east	YES	1.42
116	NO	2.69
117	YES	0.02
118	NO	8.85
119	YES	0.03
121	YES	0.05
123	YES	0.07
125	YES	0.02
127	YES	0.02
129	YES	0.06
131	YES	0.09
133	YES	0.24
135	YES	0.05
137	YES	0.01
138	YES	0.01
139	YES	0.11
140	YES	0.00
141	YES	0.01
142	YES	0.17
143	YES	0.03
144	YES	0.07
145	YES	0.03
146	YES	0.02
147	YES	0.01
148	YES	0.01
149	YES	0.36
150	YES	0.01
151	YES	0.04
152	YES	0.09
153	YES	0.02
154	YES	0.07
155	YES	0.01
156	YES	0.13
157	YES	0.26
158	YES	0.03
159	YES	0.15
160	YES	0.05
161	YES	0.07
162	YES	0.07
163	YES	0.02
164	YES	0.00
165	YES	0.01
166	YES	0.01
167	YES	0.37
168	YES	0.37
169	YES	0.01
170	YES	0.01
171	YES	0.58
172	YES	0.07
173	YES	0.11
174	YES	0.05
175	YES	0.02
176	NO	9.71
177	YES	0.00
179	YES	1.45
180	YES	0.24
181	NO	0.01
182	YES	0.03
183	NO	0.01
184	YES	2.75
185	NO	0.03
187	NO	0.02
188	YES	2.35
189	NO	0.07
190	YES	1.11
191	YES	0.08
192	YES	0.06
193	YES	0.17
194	YES	0.07
195	NO	0.03
196	YES	0.03
197	YES	0.03
198	YES	0.93
199	YES	0.36
200	YES	0.25
201	YES	0.04
202	YES	4.20
203	YES	0.19
204	YES	0.00
205	YES	10.24
206	YES	0.09
207	YES	0.02
208	YES	0.11
209	YES	0.32
210	YES	0.02
211	YES	0.09
212	YES	0.82
213	YES	0.04
214	NO	0.05
215	YES	0.04
216	NO	0.08
217	YES	0.03
218	YES	1.23
219	YES	0.05
220	YES	0.14
221	YES	1.23
222	YES	0.13
223	YES	0.00
224	YES	0.30
225	YES	0.01
227	YES	0.02
228	YES	0.04
229	YES	0.25
230	YES	0.07
231	YES	0.02
232	YES	0.06
233	YES	3.37
234	YES	8.05
235	YES	0.43
236	YES	0.04
237	YES	0.08
238	YES	0.05
239	YES	0.05
240	YES	0.27
241	YES	9.25
242	YES	0.00
243	YES	0.07
244	YES	0.01
245	YES	0.46
246	YES	0.12
247	YES	0.02
248	YES	0.62
249	YES	0.06
250	YES	0.01
251	YES	2.75
252	YES	0.07
253	YES	0.02
254	YES	0.89
255	YES	1.75
256	YES	3.20
257	YES	2.76
258	YES	12.95
259	YES	0.12
260	YES	0.03
261	YES	0.03
262	NO	0.08
263	YES	0.01
264	YES	0.02
265	NO	0.35
266	NO	0.01
268	NO	0.01
270	NO	0.09
272	NO	0.01
274	NO	0.04
276	YES	0.01
112-A	YES	0.00
112-B	YES	1.06
120-A	YES	0.82
120-B	YES	0.46
122-A	YES	0.35
122-B	YES	0.17
124-A	NO	0.01
124-B	YES	0.28
126-A	NO	0.01
126-B	YES	0.04
128-A	YES	0.00
128-B	YES	0.09
130-A	YES	0.02
130-B	YES	0.05
132-A	NO	0.03
132-B	YES	0.06
134-A	YES	0.10
134-B	NO	0.05
134-C	YES	0.06
226-A	YES	0.03
226-B	YES	0.07



Figure 1 | WIP Site Location
White Pine Copper
Carp Lake Twp
Ontonagon County
WIP - HQ6-65JR-KA16Y

0 2.25 4.5 Miles

WIP Assessment Area

EGLE
MICHIGAN DEPARTMENT OF ENVIRONMENT, GREAT LAKES, AND ENERGY

Map created: Jan. 2025
K. Gyekis,
Wetlands, Lakes, and Streams Unit
EGLE WRD

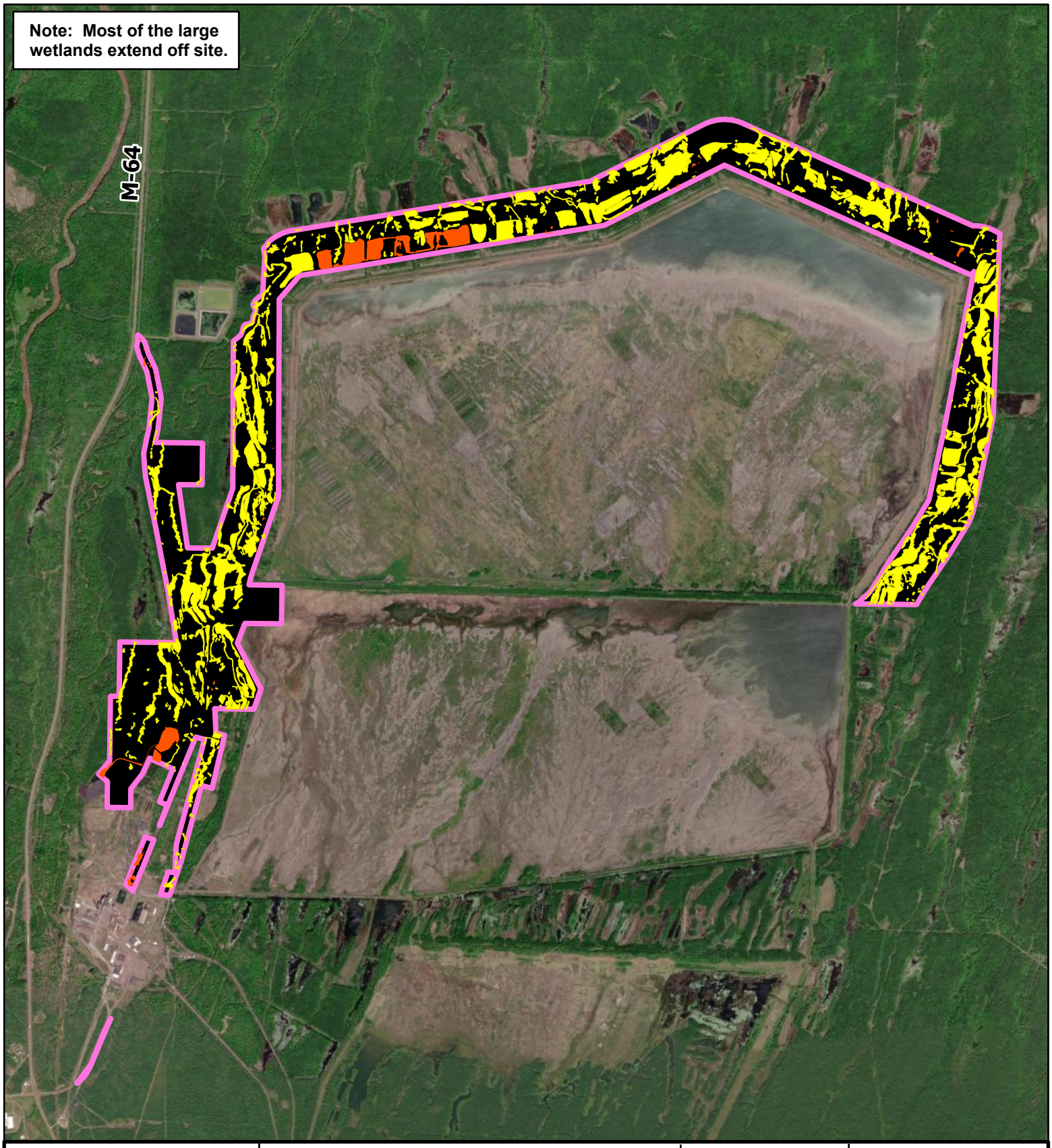


Figure 2 | WIP Site Overview
White Pine Copper
Carp Lake Twp
Ontonagon County
WIP - HQ6-65JR-KA16Y

0 1,500 3,000 Ft

WIP Assessment Area [1,030 ac]
EGLE Regulated Wetland ; by Part 303 of NREPA
EGLE Unregulated Wetland

This drawing showing those areas containing wetland and not containing wetland is an approximation of the boundaries flagged on-site.

This drawing does not authorize or permit activities requiring a permit in accordance with Part 303 of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended.

EGLE
MICHIGAN DEPARTMENT OF ENVIRONMENT, GREAT LAKES, AND ENERGY

Map created: Jan. 2025
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Wetlands, Lakes, and Streams Unit
EGLE WRD

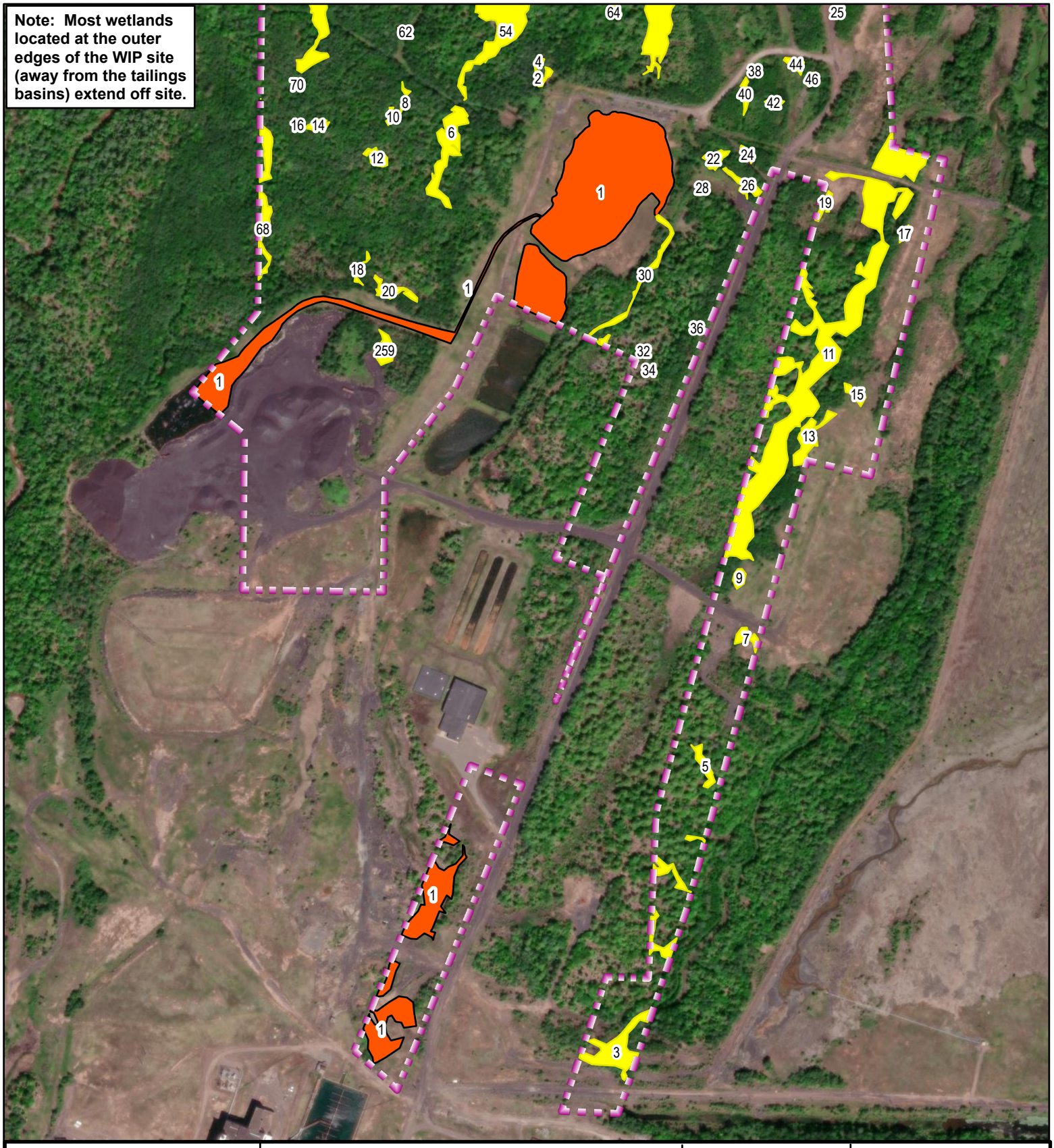


Figure 3a | WIP Site Detail
White Pine Copper
Carp Lake Twp
Ontonagon County
WIP - HQ6-65JR-KA16Y

WIP Assessment Area Boundary

EGLE Regulated Wetland ~ by Part 303 of NREPA

EGLE Unregulated Wetland

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EGLE
MICHIGAN DEPARTMENT OF ENVIRONMENT, GREAT LAKES, AND ENERGY

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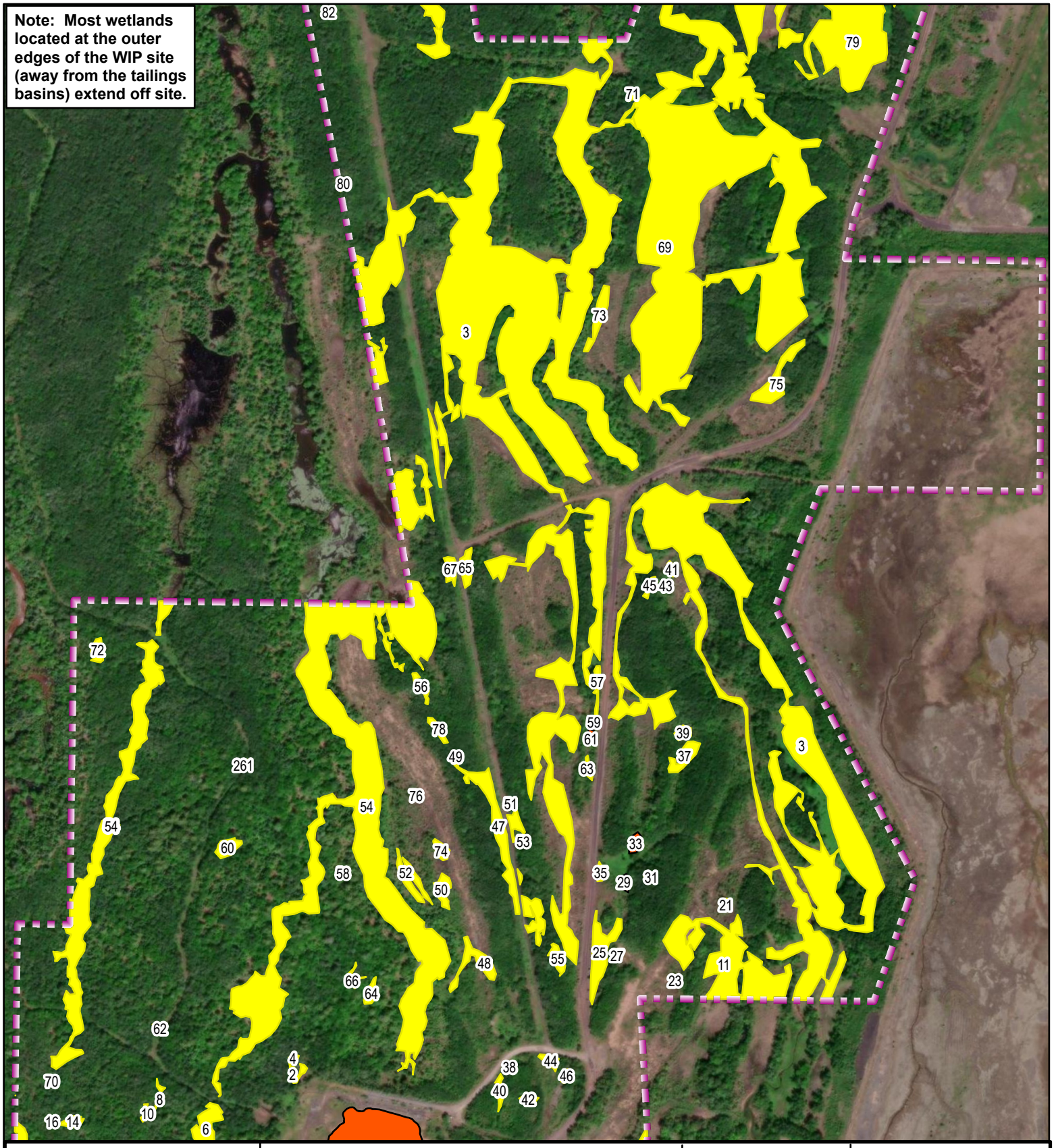


Figure 3b | WIP Site Detail
White Pine Copper
Carp Lake Twp
Ontonagon County
WIP - HQ6-65JR-KA16Y

0 250 500 Ft

WIP Assessment Area Boundary
EGLE Regulated Wetland ~ by Part 303 of NREPA
EGLE Unregulated Wetland

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EGLE
MICHIGAN DEPARTMENT OF ENVIRONMENT, GREAT LAKES, AND ENERGY

Map created: Jan. 2025
K. Gyekis,
Wetlands, Lakes, and Streams Unit
EGLE WRD

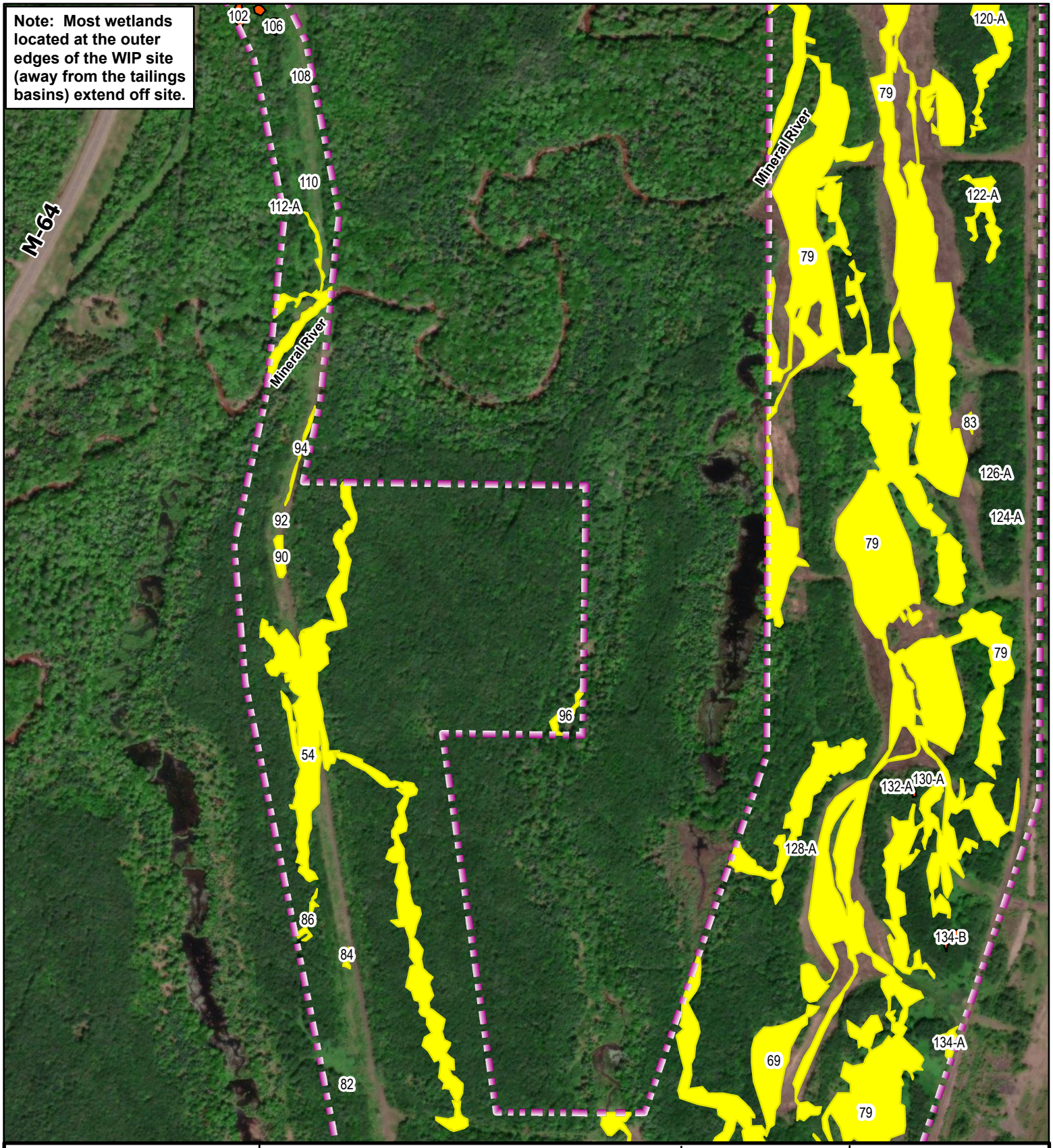


Figure 3c | WIP Site Detail
White Pine Copper
Carp Lake Twp
Ontonagon County
WIP - HQ6-65JR-KA16Y

0 250 500 Ft

WIP Assessment Area Boundary

EGLE Regulated Wetland ~ by Part 303 of NREPA

EGLE Unregulated Wetland

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EGLE
MICHIGAN DEPARTMENT OF ENVIRONMENT, GREAT LAKES, AND ENERGY

Map created: Jan. 2025
K. Gyekis,
Wetlands, Lakes, and Streams Unit
EGLE WRD

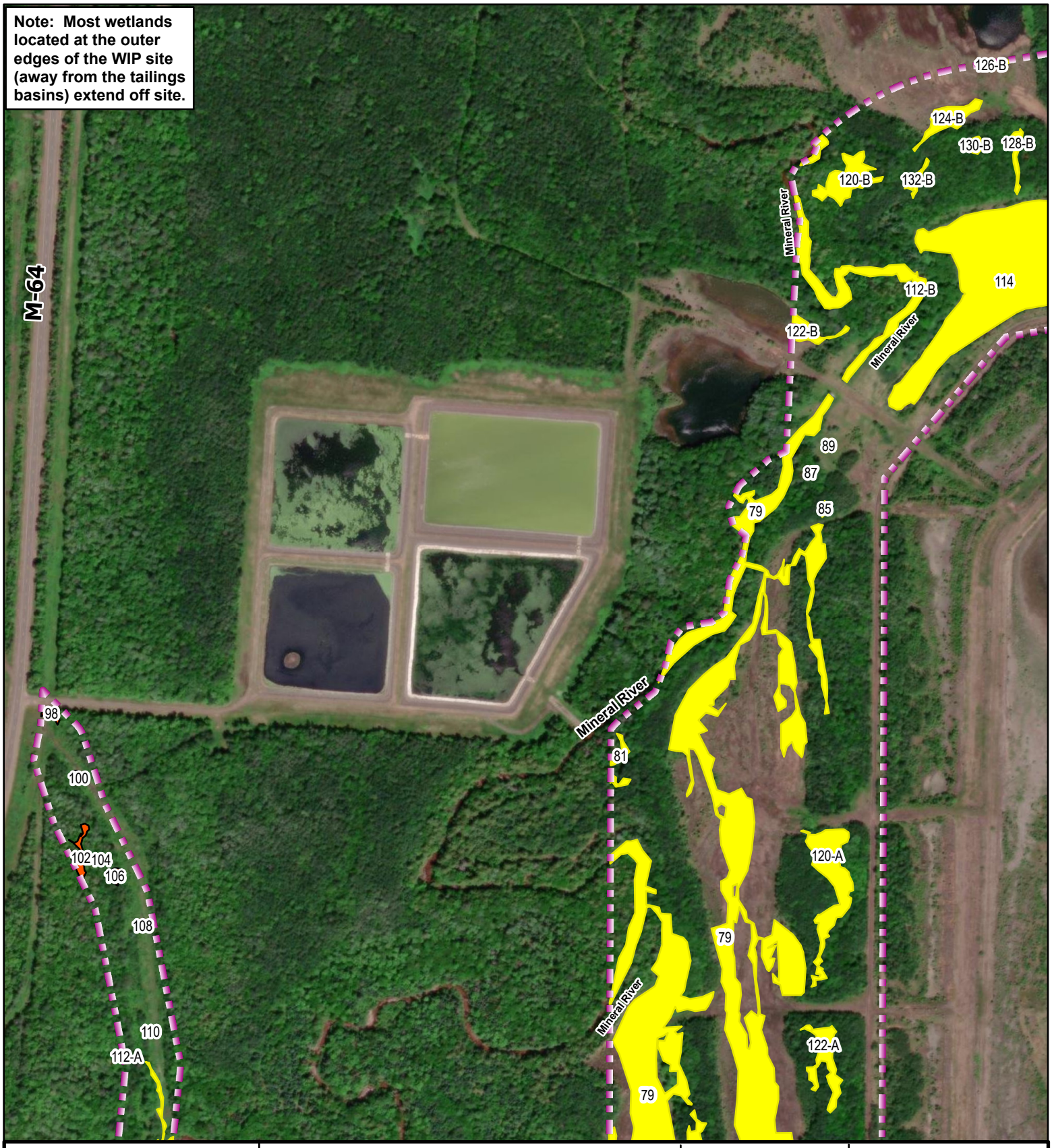


Figure 3d | WIP Site Detail
White Pine Copper
Carp Lake Twp
Ontonagon County
WIP - HQ6-65JR-KA16Y

0 250 500 Ft

- WIP Assessment Area Boundary
- EGLE Regulated Wetland ~ by Part 303 of NREPA
- EGLE Unregulated Wetland

This drawing showing those areas containing wetland and not containing wetland is an approximation of the boundaries flagged on-site.

This drawing does not authorize or permit activities requiring a permit in accordance with Part 303 of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended.

EGLE
MICHIGAN DEPARTMENT OF ENVIRONMENT, GREAT LAKES, AND ENERGY

Map created: Jan. 2025
K. Gyekis,
Wetlands, Lakes, and Streams Unit
EGLE WRD



Figure 3e | WIP Site Detail
White Pine Copper
Carp Lake Twp
Ontonagon County
WIP - HQ6-65JR-KA16Y

WIP Assessment Area Boundary

EGLE Regulated Wetland ~ by Part 303 of NREPA

EGLE Unregulated Wetland

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EGLE
MICHIGAN DEPARTMENT OF ENVIRONMENT, GREAT LAKES, AND ENERGY

Map created: Jan. 2025
K. Gyekis,
Wetlands, Lakes, and Streams Unit
EGLE WRD

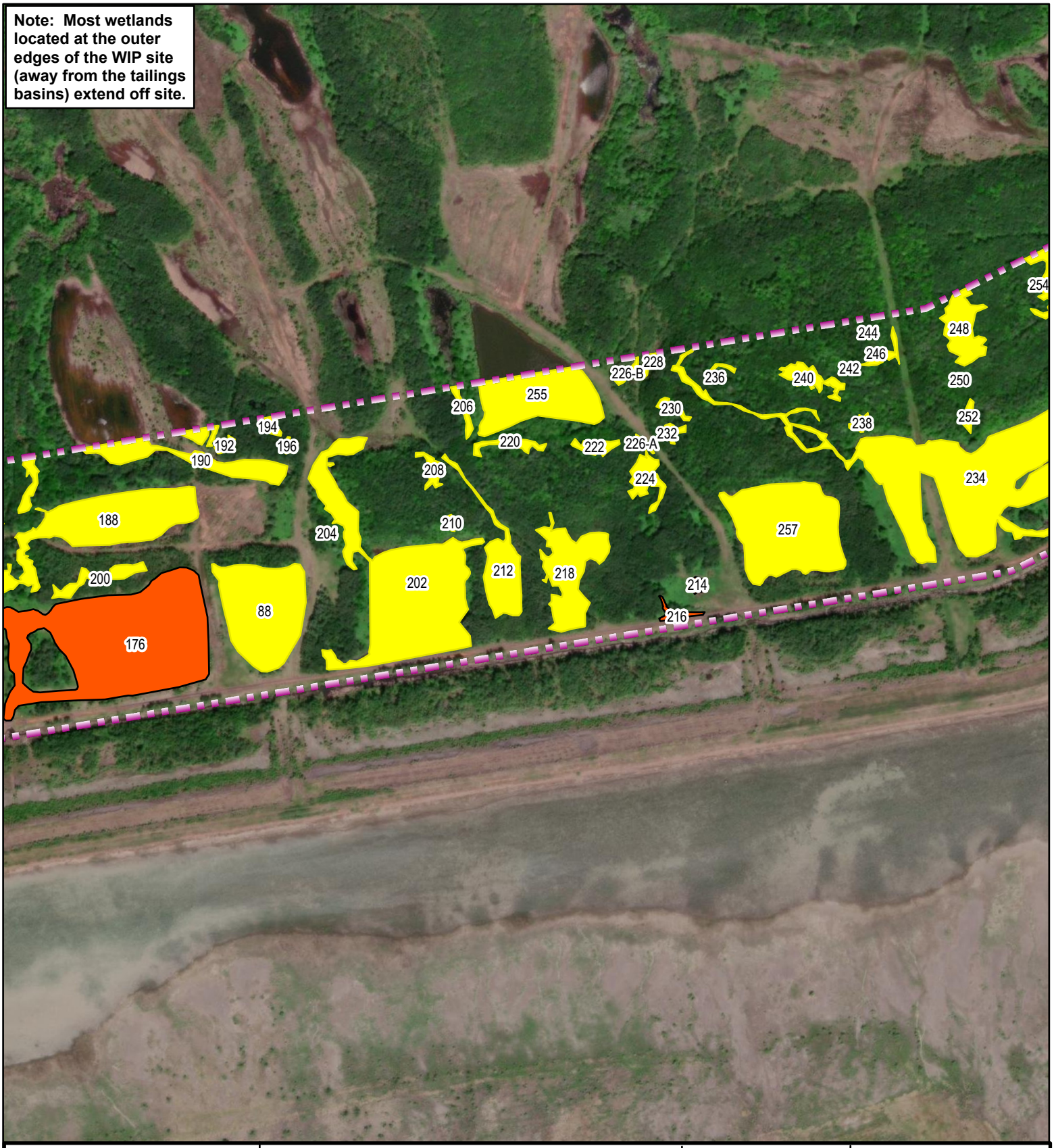


Figure 3f | WIP Site Detail
White Pine Copper
Carp Lake Twp
Ontonagon County
WIP - HQ6-65JR-KA16Y

0 250 500 Ft

WIP Assessment Area Boundary
EGLE Regulated Wetland ~ by Part 303 of NREPA
EGLE Unregulated Wetland

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EGLE
MICHIGAN DEPARTMENT OF ENVIRONMENT, GREAT LAKES, AND ENERGY

Map created: Jan. 2025
K. Gyekis,
Wetlands, Lakes, and Streams Unit
EGLE WRD

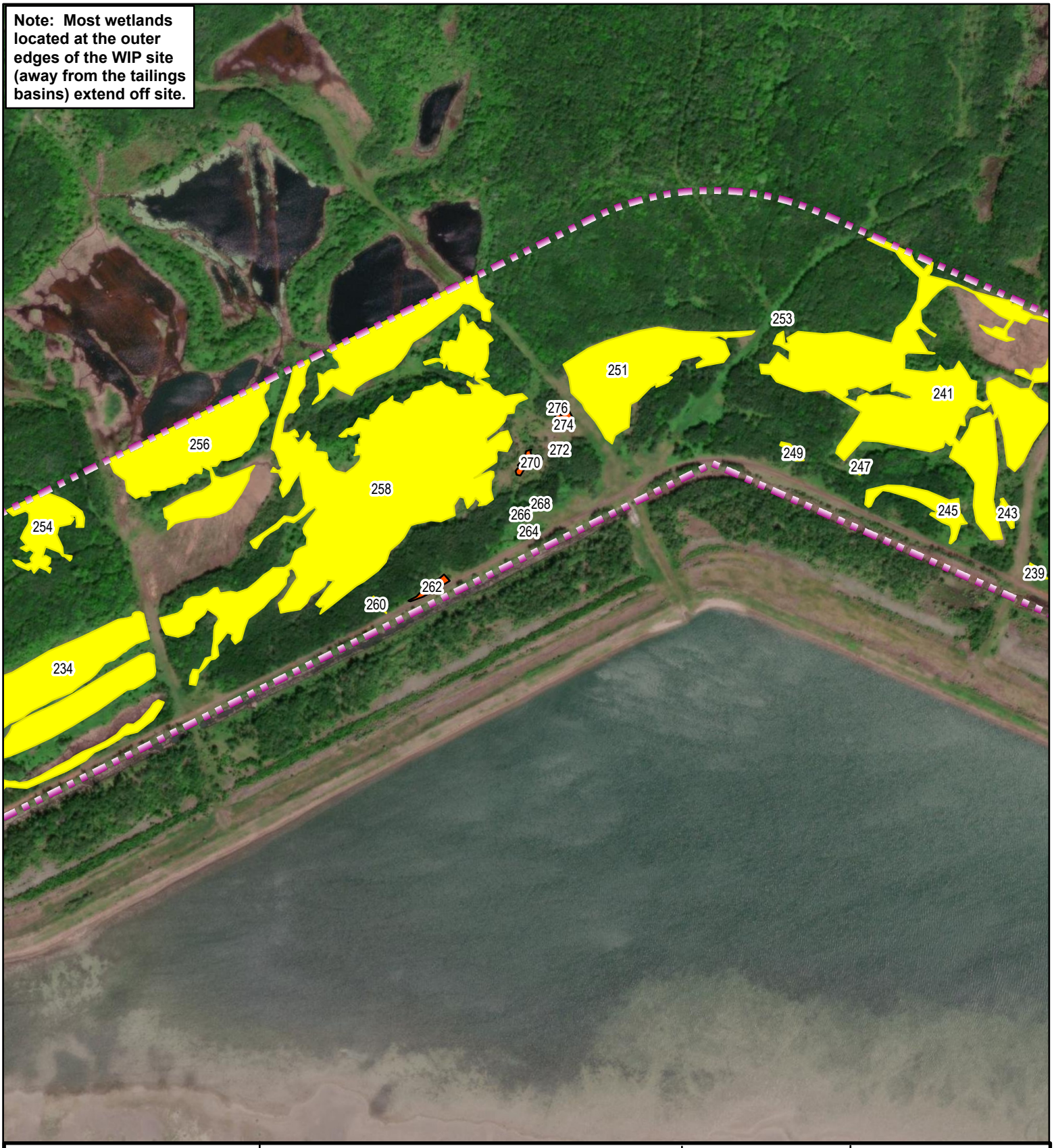


Figure 3g | WIP Site Detail
White Pine Copper
Carp Lake Twp
Ontonagon County
WIP - HQ6-65JR-KA16Y

0 250 500 Ft

WIP Assessment Area Boundary
EGLE Regulated Wetland ~ by Part 303 of NREPA
EGLE Unregulated Wetland

This drawing showing those areas containing wetland and not containing wetland is an approximation of the boundaries flagged on-site.

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EGLE
MICHIGAN DEPARTMENT OF ENVIRONMENT, GREAT LAKES, AND ENERGY

Map created: Jan. 2025
K. Gyekis,
Wetlands, Lakes, and Streams Unit
EGLE WRD

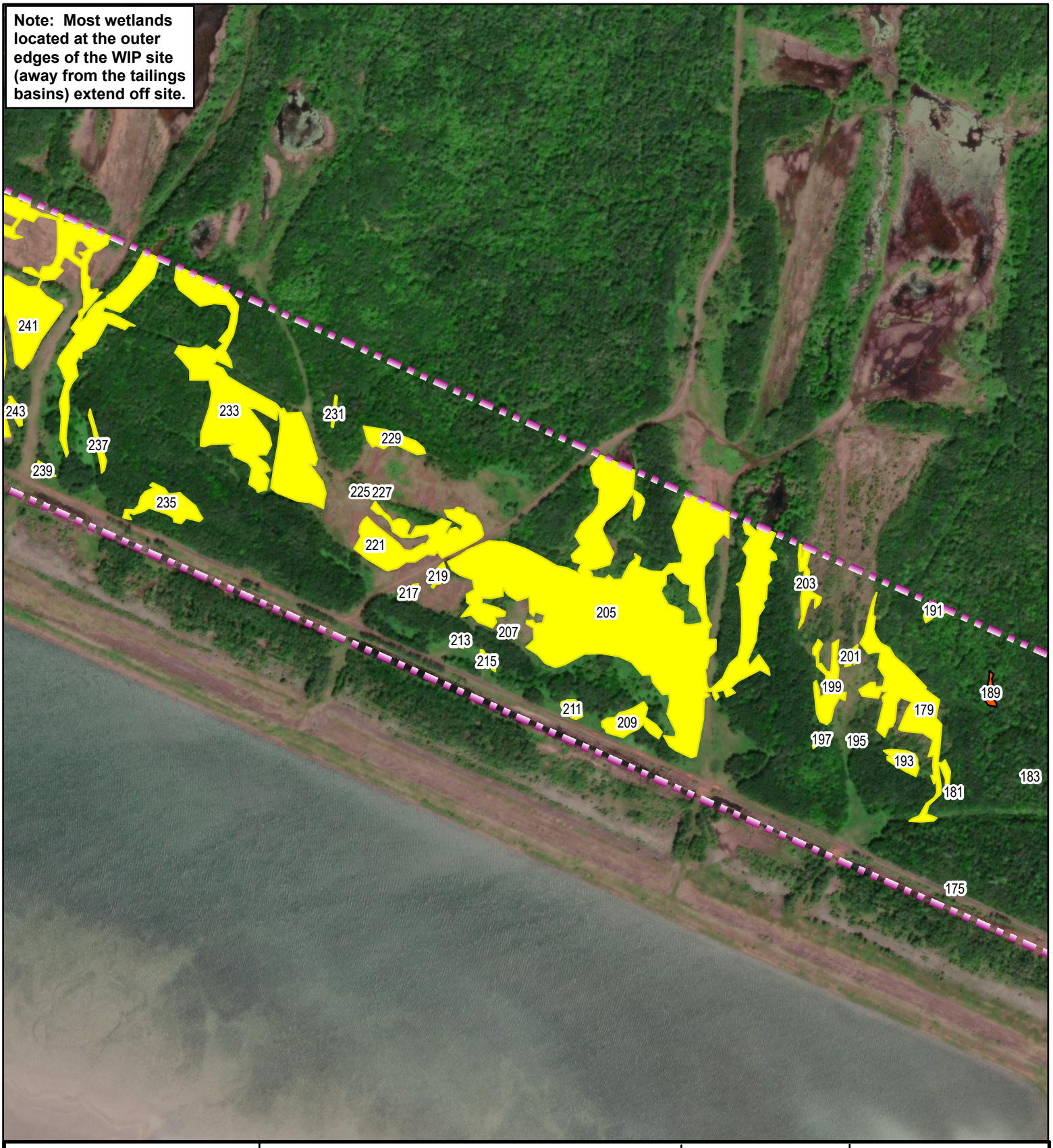


Figure 3h | WIP Site Detail
White Pine Copper
Carp Lake Twp
Ontonagon County
WIP - HQ6-65JR-KA16Y

0 250 500 Ft

WIP Assessment Area Boundary
EGLE Regulated Wetland ~ by Part 303 of NREPA
EGLE Unregulated Wetland

This drawing showing those areas containing wetland and not containing wetland is an approximation of the boundaries flagged on-site.

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EGLE
MICHIGAN DEPARTMENT OF ENVIRONMENT, GREAT LAKES, AND ENERGY

Map created: Jan. 2025
K. Gyekis,
Wetlands, Lakes, and Streams Unit
EGLE WRD

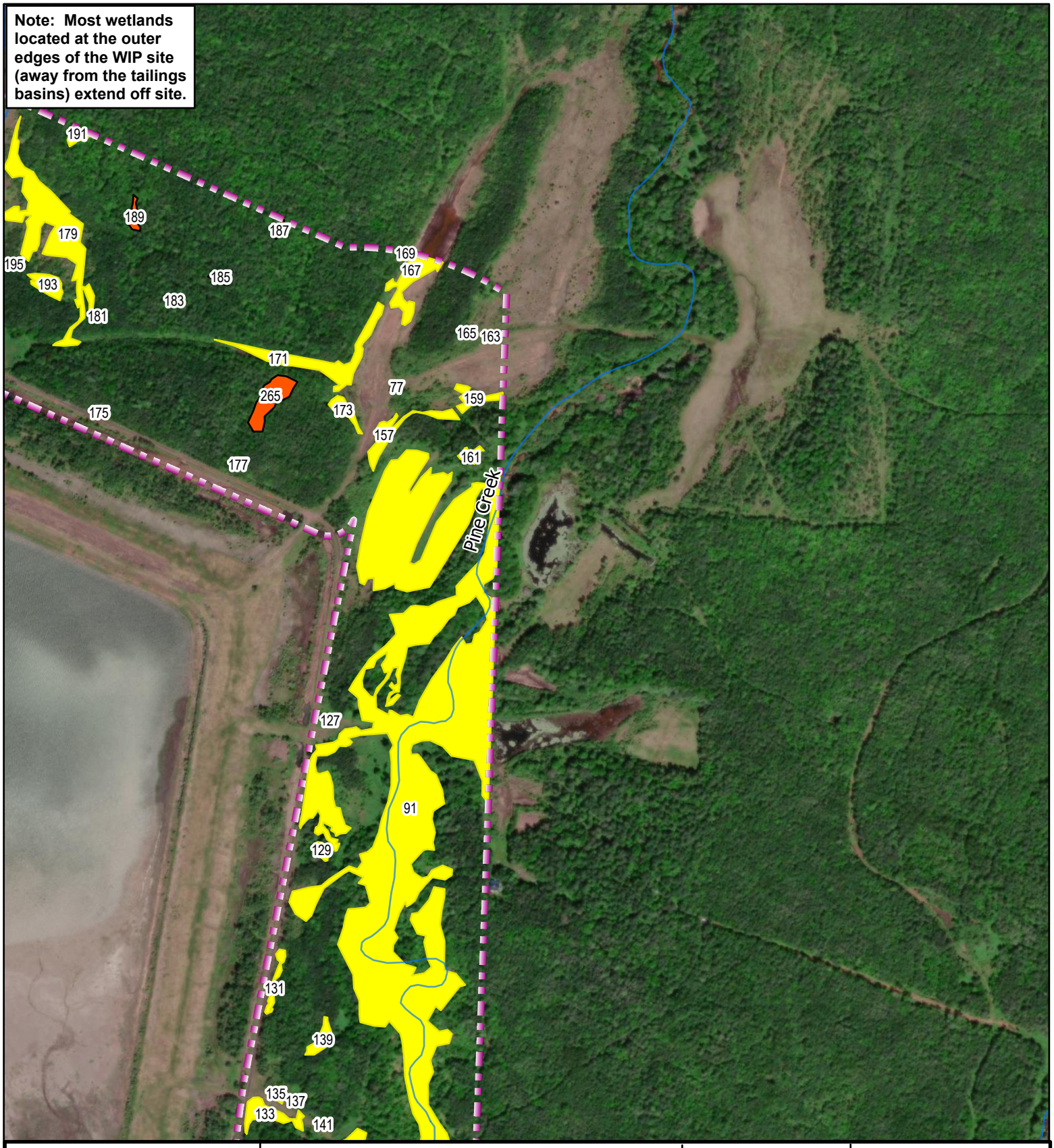


Figure 3i | WIP Site Detail
White Pine Copper
Carp Lake Twp
Ontonagon County
WIP - HQ6-65JR-KA16Y

0 250 500 Ft

- Stream
- WIP Assessment Area Boundary
- EGLE Regulated Wetland ~ by Part 303 of NREPA
- EGLE Unregulated Wetland

This drawing showing those areas containing wetland and not containing wetland is an approximation of the boundaries flagged on-site.

This drawing does not authorize or permit activities requiring a permit in accordance with Part 303 of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended.

EGLE
MICHIGAN DEPARTMENT OF ENVIRONMENT, GREAT LAKES, AND ENERGY

Map created: Jan. 2025
K. Gyekis,
Wetlands, Lakes, and Streams Unit
EGLE WRD



Figure 3j | WIP Site Detail
White Pine Copper
Carp Lake Twp
Ontonagon County
WIP - HQ6-65JR-KA16Y

0 250 500 Ft

- Stream
- WIP Assessment Area Boundary
- EGLE Regulated Wetland ~ by Part 303 of NREPA
- EGLE Unregulated Wetland

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EGLE
MICHIGAN DEPARTMENT OF ENVIRONMENT, GREAT LAKES, AND ENERGY

Map created: Jan. 2025
K. Gyekis,
Wetlands, Lakes, and Streams Unit
EGLE WRD

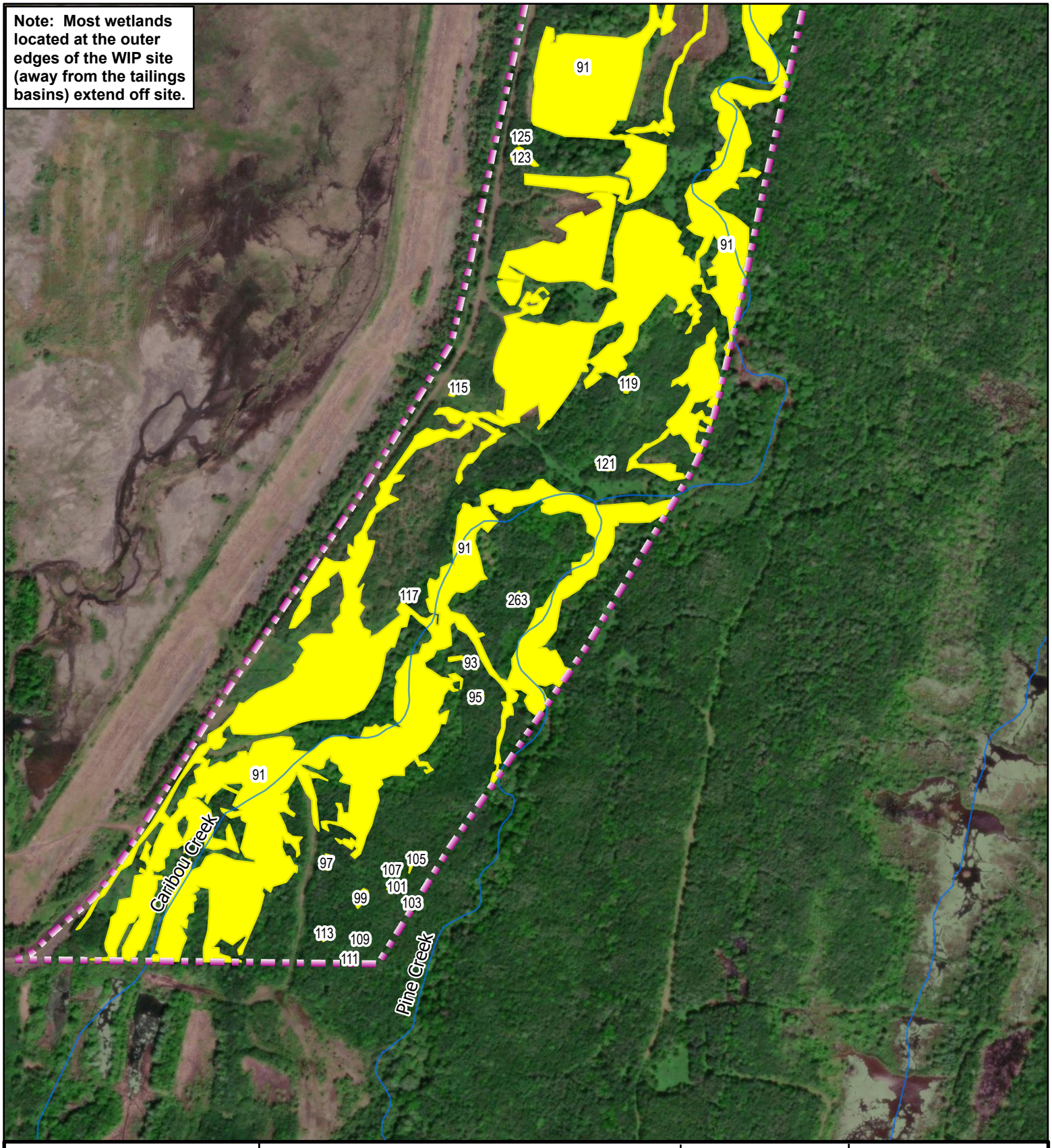


Figure 3k | WIP Site Detail
White Pine Copper
Carp Lake Twp
Ontonagon County
WIP - HQ6-65JR-KA16Y

0 250 500 Ft

- Stream
- WIP Assessment Area Boundary
- EGLE Regulated Wetland ~ by Part 303 of NREPA
- EGLE Unregulated Wetland

This drawing showing those areas containing wetland and not containing wetland is an approximation of the boundaries flagged on-site.

This drawing does not authorize or permit activities requiring a permit in accordance with Part 303 of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended.

EGLE
MICHIGAN DEPARTMENT OF ENVIRONMENT, GREAT LAKES, AND ENERGY

Map created: Jan. 2025
K. Gyekis,
Wetlands, Lakes, and Streams Unit
EGLE WRD

E-3

2024 Stream Characterization Report

2024 Stream Characterization Report

White Pine North Project, Carp Lake Township, Ontonagon County, Michigan

Prepared for
White Pine Copper, LLC

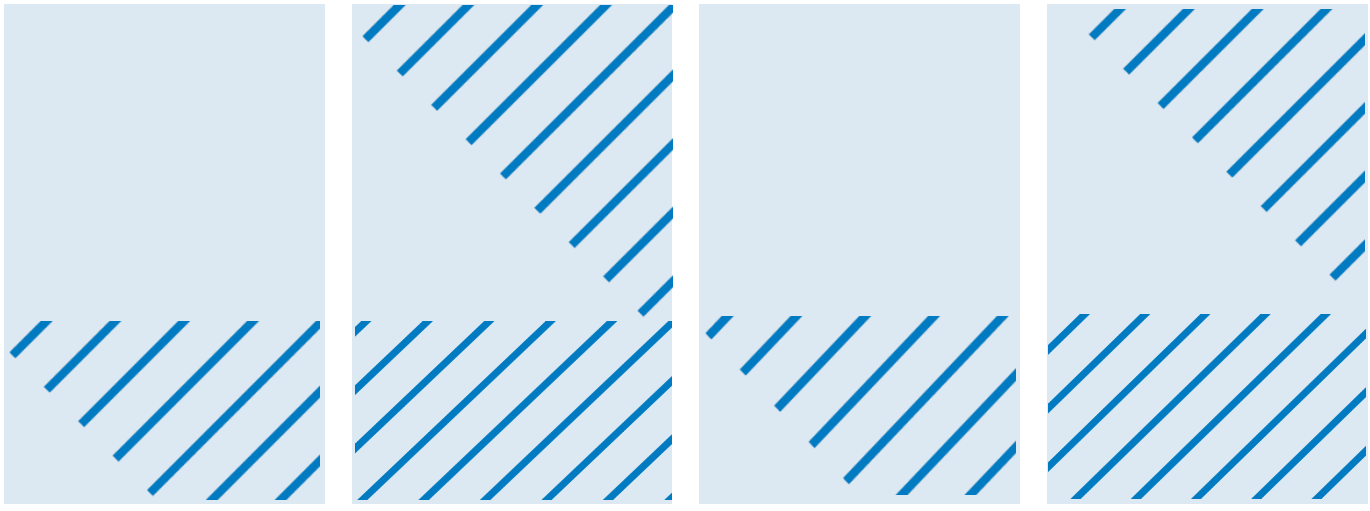
Prepared by
Barr Engineering Co.

March 7, 2025

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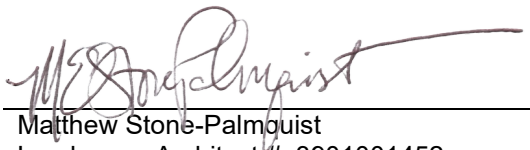
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Certification

I hereby certify that this stream characterization report was prepared by me or under my direct supervision. It reflects a comprehensive assessment of the physical, chemical, and biological conditions on on-site streams and complies with applicable environmental standards and regulations.



Matthew Stone-Palmquist
Landscape Architect #: 3901001452

March 11, 2025
Date

2024 Stream Characterization Report

White Pine North Project, Carp Lake Township, Ontonagon County, Michigan

March 7, 2025

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1 Introduction

1.1 Study Purpose

Barr Engineering Co. (Barr) was retained by White Pine Copper, LLC (WPC) to characterize streams at the White Pine North Project (Project). The focus of the study completed by Barr was to characterize "streams[1]" as are regulated by the State of Michigan under Part 301 of the Natural Resources and Environmental Protection Act (NREPA; PA 451 of 1994, as amended) and in accordance with the Michigan Stream Quantification Tool (MiSQT) developed and published by the Michigan Department of Environment, Great Lakes and Energy Water Resources Division (EGLE WRD). This report presents stream characterization activities and findings from field surveys conducted in summer 2024.

1.2 Study Team

This study was completed by a qualified team of experienced professionals with a background in stream assessments. Key team members and their roles are listed below.

Field Assessments and Reporting

- David Baldus—Water Resources Scientist; MiSQT assessments and reporting.
- Jill Geyer—Water Resources Engineer; MiSQT assessments and reporting.
- Colleen Long—Senior GIS Specialist; mapping and GIS analysis.
- Peter Hinck, PE—Senior Water Resources Engineer; technical advisor.

Project Leadership

- Matt Stone-Palmquist, PLA—Senior Landscape Architect/Sr. Ecologist; study lead.
- Tim Greenleaf, PE—Senior Civil/Environmental Engineer; project principal.

1.3 Background and Project Description

WPC is a joint venture between Kinterra Copper USA, LLC (66% ownership) and Highland Copper Corporation (34% ownership). WPC is seeking to develop the brownfield site of White Pine Mine located approximately 3 miles south of Lake Superior, east of M-64, in Carp Lake Township, Ontonagon County Michigan shown in Figure 1. White Pine Mine was part of the Upper Peninsula of Michigan's historical copper mining district. Underground mining on site began in the late 1800's. In 1952, the Copper Range Company began construction of a fully functioning underground mine and surface processing facilities including a concentrator, smelter, and refinery. Tailings were placed in three tailings areas: North Dam 1, North Dam 2, and the South Dam. Mining and processing ceased in 1997 and a State of Michigan

[1] NATURAL RESOURCES AND ENVIRONMENTAL PROTECTION ACT, Act 451 of 1994
324.30101 Definitions.
Sec. 30101.
(i) "Inland lake or stream" means…:
(ii) A natural or artificial lake, pond, or impoundment; a river, stream, or creek which may or may not be serving as a drain as defined by the drain code…or any other body of water that has definite banks, a bed, and visible evidence of a continued flow or continued occurrence of water, including the St. Marys, St. Clair, and Detroit Rivers.

Consent Decree was established. WPC is planning to mine underground east of, and separate from, the historic underground mine workings of White Pine Mine. Copper ore will be extracted using conventional drill and blast room and pillar mining methods. A processing plant will be constructed on site to produce a copper concentrate, and processing will include crushing, grinding, flotation, concentrate thickening, and filtration. Tailings will be managed through re-use of one or more of the existing tailings dams.

Based on the Project concept, WPC will need to secure several environmental permits and approvals from EGLE WRD. Those permits and approvals relevant to streams in the vicinity of the Project include:

- A Mining Permit and Environmental Impact Assessment issued and approved under Part 632 of NREPA, and rules specified in R 425.202 et seq.; and
- An Inland Lakes and Streams Permit for disturbances to streams issued in accordance with Part 301 of NREPA and rules specified in R 281.811 et seq.

The baseline studies required for the Project are rooted in the requirements for the Part 632 Environmental Impact Assessment specified in R 425.202 et seq. and the Part 301 Inland Lakes and Streams Protection. Permits under both parts may be needed if any construction or mining activities have the potential to result in direct and/or indirect impacts to streams. Direct impacts include excavation and filling of streams while indirect impacts result in changes to the drainage or flow of the stream.

Delineations and characterization of potentially directly and indirectly impacted streams will be needed to satisfy applications for both the Part 632 Mining Permit/Environmental Impact Assessment and the Part 301, Inland Lakes and Streams Permit. Under Part 632 Rule 425.202(2)(m), the Environmental Impact Assessment requires baseline data and characterization of streams within the mining and affected area.

This report addresses the footprint of new surface facilities. Within this footprint, streams were characterized to assess and quantify functions and values to a level of detail sufficient to fulfill EGLE WRD requirements. Streams located over the orebody, east of the current Survey Area, will be assessed under a separate study.

1.4 Study Area

The Study Area consists of two areas, which are shown in Figure 2, including:

1. **Proposed Surface Facilities:** This footprint includes locations for proposed surface facility development by WPC including the surface footprint, the toe of the potential tailings dam expansion area, the transmission line corridor, and the railroad corridor.
2. **Survey Area:** The “Survey Area” is a subset of the Proposed Surface Facilities footprint and consists of the proposed surface facilities footprint in locations where WPC presently has surface rights. The Survey Area is where detailed, in-field assessments of streams were planned for this study.

The National Hydrography Dataset (NHD) stream lines, shown in Figure 3, were used to identify potential stream locations for study relative to the Survey Area. Figure 4 shows locations where streams were identified during field reconnaissance in addition to locations that have a NHD flow line, but field reconnaissance did not identify streams being present. This difference is attributed to past disturbance in the watershed that has affected the accuracy of the NHD stream lines particularly in areas where the headwaters of streams were cutoff by the historical tailings dams. As flowing water is an active agent of

erosion in streams, and over time creates changes in stream patterns, it is not uncommon to observe differences between the present stream channel and NHD stream lines.

1.5 Available Data Sources

The following data sources were made available by WPC:

- 1978, Environmental Assessment Report White Pine Copper Division (Baker).
- 1999, Remedial Investigation Report – White Pine Mine (MFG Inc.).
- 2011, Mine Permit Application for Copperwood including descriptions of soil, geology, hydrology, ecology, flora, and fauna, of a similar site approximately 20 miles to the west of the Project.
- 2014-2015, ecological surveys including vegetation, wetlands, water quality (surface and groundwater resources), and land cover (timber stand) data for the Project area.

The following data sources are publicly available:

- General topographic mapping of the site (Lidar, USG topo quads (ref. (1)).
- NHD stream alignments (ref. (2)).
- High Resolution aerial photos.
- Nearby Stream Gages – State and USGS Gages:
    - Mineral River DS of Native CK NR Silver City, MI – 040325155.
    - West Branch Ontonagon River Near Bergland, MI – 04036000.
    - Ontonagon River Near Rockland, MI – 04040000.
- Hydraulic Geometry Regional Curves (various authors).
- State Watersheds – MI DNR Major Watersheds (ref. (3)).
- Stream Evaluator – MI DNR Survey: https://www.mcgi.state.mi.us/smdt/.
- Biological Monitoring of Michigan's Rivers and Streams. EGLE WRD. https://storymaps.arcgis.com/stories/32872a04c68d43c9acfc12948d2a3748.

The available data sources provide useful background information regarding the conditions of the site but do not contain sufficient data to complete MiSQT analysis of the on-site streams. As a result, stream geomorphology, biology, and physicochemical data were collected to characterize streams in the Survey Area that may be directly impacted based on current project definition and understanding.

2 Methods

2.1 Desktop Review

To support stream characterization activities, a desktop evaluation was conducted for the streams identified in the Survey Area. The desktop evaluation activities assessed contributing watershed area, stream length, and land cover. For streams in the Survey Area, initial reach segmentation was evaluated through desktop evaluation according to MiSQT reach break criteria (Ref (4)). Reach break criteria includes the confluence of a tributary to the main stem, culverts, changes to valley morphology, stream type, bed material composition, and level of anthropogenic modifications.

2.2 Field Data Collection

Field data collection for the Survey Area followed MiSQT procedures (Ref (4)). Each stream was evaluated for Existing Conditions Score and Functional Feet. Note, Functional Feet calculations were based on an approximation of total stream length using field data from surveyed reaches and an approximation of channel centerlines from aerial photography.

Barr completed initial field reconnaissance to confirm presence/absence of surveyable channels, locate areas for stream surveys, and determine safe access to these areas on June 10 and 11, 2024. A photolog from initial field reconnaissance is provided in Appendix A.

All streams identified through desktop assessment within the Survey Area were field verified to confirm the presence of stream features. The desktop review was based heavily on the review of NHD flow lines and available topography data. Field review of NHD stream locations affirmed no streams present in some locations. Locations without definite banks, a bed, and/or visible evidence of a continued flow of water do not appear to meet the definition of a stream under Part 301 and thus were excluded from stream characterization. Note, field reconnaissance did not include a systematic field-based search of the Survey Area to identify the potential for stream channels unmapped by NHD, however we note that the EGLE Wetland Identification Report prepared for the project involved thorough review of the AOI and does not indicate any additional 301 stream features (ref. (5)).

Initial reach breaks made during desktop assessment were field verified and adjusted based on MiSQT reach break criteria (Ref (4)). Representative sub-reaches were selected for being representative of reach conditions and were 20 times the average bankfull width of the reach or the entire length of the reach.

The MiSQT field parameters that were assessed to perform stream characterization and the general methodology used to collect them are presented in the following sub-sections. Barr performed the geomorphic, hydraulic, and hydrology data collection June 12-14, 2024 and July 8-12, 2024. Figure 5 shows stream geomorphic data collection locations. A photolog from geomorphic field assessments is provided in Appendix B.

2.2.1 Hydrology Parameters

Hydrology parameters evaluated by Barr included reach runoff parameters for the following metrics:

- **Land Use Change Coefficient:** An area weighted land use coefficient was calculated for the lateral drainage area adjacent to the project reach using recent aerial imagery or National Land Cover Database (NCLD) data; and

- **Concentrated Flow Points:** The number of concentrated flow points that enter the project reach per 1,000 linear stream of was assessed from recent aerial imagery and confirmed through field evaluation. Concentrated flow points are channels, erosional features, or other anthropogenic impacts that deliver concentrated flow to the channel.

2.2.2 Hydraulic Parameters

Hydraulic parameters evaluated by Barr include floodplain connectivity parameters for the following metrics:

- **Bank Height Ratio:** The bank height ratio was calculated by dividing the low bank height by the maximum bankfull riffle depth. Bank height ratio was measured at each riffle within the representative sub-reach during the field survey and a length weighted average bank height ratio was calculated for each reach.

- **Entrenchment Ratio:** The entrenchment ratio was calculated by dividing the flood-prone width by the bankfull width. Flood-prone and bankfull width was measured for each riffle within the representative sub-reach by rangefinder in the field. Entrenchment ratio for the sub-reach was calculated as a length weighted average.

2.2.3 Geomorphic Parameters

Geomorphic parameters evaluated by Barr include:

- **Large Wood Debris Index:** Large Woody Debris Index was calculated for a 328-foot (100-meter) segment of each representative sub-reach. Large woody debris pieces and debris dams within this segment were scored in the field following guidance described in the Application of the Large Woody Debris Index: A Field User Manual Version 1 (ref. (6)).

- **Lateral Migration**
    - ***Dominant Bank Erosion Hazard Index/Near Bank Shear Stress (BEHI/NBS):*** Banks on the outside of bends within each representative sub-reach were evaluated in the field for BEHI/NBS scoring. The BEHI/NBS score calculated as a length weighted average is reported as the dominant BEHI/NBS score for each reach. Procedures for this metric are described in Appendix D of the Function-Based Rapid Field Stream Assessment Methodology (ref. (7)), or River Stability Field Guide, Second Edition (ref. (8)).

    - ***Percent Streambank Erosion:*** Percent streambank erosion was calculated from BEHI/NBS survey data. The sum of length of actively eroding banks was divided by the total reach length to calculate percent streambank erosion. Actively Eroding Banks are banks with a BEHI/NBS rating of M/M, M/H, M/VH, M/Ex or banks with a BEHI rating of H, VH, or Ex regardless of NBS rating.

    - ***Percent Streambank Armoring:*** Percent Streambank Armoring was calculated by the sum of the length of all armored banks within the sub-reach divided by the total length of streambank in the sub-reach. Streambank Armoring is any rigid human-made bank stabilization effort such as rip-rap, concrete, or gabion baskets.

- **Bedform Diversity**
    - ***Pool Spacing Ratio:*** Pool Spacing Ratio is the distance between sequential geomorphic pools divided by the bankfull width (assessed at the stable representative riffle). A Pool Spacing Ratio was calculated for each pair of sequential pools. The median value of Pool Spacing Ratios for the reach were entered as the field value.
    - ***Pool Depth Ratio:*** Pool Depth Ratio is the maximum bankfull pool depth (measured at each geomorphic and each significant pool) divided by the mean bankfull riffle depth (assessed at the stable representative riffle). The average of these values was entered as the field value.
    - ***Percent Riffle:*** Riffle length of each riffle in each representative sub-reach was measured from head of riffle to head of pool. The sum of riffle lengths was divided by the total stream length of the sub-reach and multiplied by 100 to generate a percent riffle value.
    - ***Aggradation Ratio:*** Aggradation Ratio is the width-to-depth ratio (W/D) of the widest riffle in the representative sub-reach divided by a reference W/D chosen based on stream type and professional judgement. W/D is calculated by dividing the bankfull width by the mean bankfull depth.
- **Riparian Vegetation**
    - ***Buffer Width:*** Riparian Buffer Width was measured by desktop analysis of aerial photographs and verified in the field. The width of the natural vegetation measured from the stream bank into the floodplain was measured separately for the left and right bank at each vegetation plot. The average of the left and right stream bank buffer width values was entered as the field value.

Geomorphic parameters evaluated by Stantec on behalf of WPC (through a separate Habitat and Land Cover Study) were provided to Barr. These geomorphic parameters include riparian vegetation assessments of the metrics listed below. The data provided by Stantec is provided in Appendix C – Vegetation Data from Stantec and include:

- **Vegetation Plots:** Vegetation metrics were assessed at evenly distributed plots along the representative sub-reach. Sample plot locations were established according to MiSQT Data Collection and Analysis Manual guidance and marked by GPS and visibly staked by Barr, during field surveys. Metrics were collected by Stantec on August 5th and 6th.
    - ***Average DBH*****:** Average diameter at breast height (DBH) was calculated by recording the species and DBH of each living tree in each vegetation plot and calculating the average across all plots. Trees are defined as any woody plant that has at least a 3-inch DBH. DBH is measured at 4.5 feet above ground level.
    - ***Tree Density*****:** Tree density was reported as stems per acre. Trees with multiple stems were counted as a single tree. Tree density was calculated for each plot and the average tree density for the reach was entered as the field value.
    - ***Native Shrub/Sapling Density:*** Native shrub/sapling density was reported as stems per acre. Shrubs/saplings are defined as woody plants that are greater than 3.28 feet in

height and less than 3-inches DBH. The species of each shrub/sapling within each vegetation plot was recorded. Shrub/sapling density was calculated for each plot and the average shrub/sapling density for the reach was entered as the field value.

- ***Native Herbaceous Cover:*** The percent cover of each herbaceous vegetation species, bare soil area, and open water areas were estimated for each plot to 5% increments. The total percentage for any one plot should not exceed 100. The cover of all native species was summed for each plot and averaged for the reach across all plots. This was entered as the field value.

2.2.4 Physicochemical Parameters

Physicochemical parameters evaluated by Barr include:

- **July Mean Temperature:** Continuous temperature sensors were installed near the downstream end of each stream identified for survey. Data were recorded at a sampling interval of 15-minutes for the calendar month of July 2024. The mean of these values was entered as the field value.
- **Dissolved Oxygen Concentration:** Continuous recording dissolved oxygen (DO) loggers were deployed near the downstream extent of stream identified for survey. Loggers recorded DO concentration (mg/L) for the month of July with a sampling interval of 15 minutes. The minimum of DO concentrations from the July 1 – 7, 2024 were entered as the field value for this metric.

Temperature and DO monitoring locations are shown in Figure 6.

Physicochemical parameters evaluated by WPC and provided to Barr (included in Appendix C – Physicochemical Data from White Pine Copper) include:

- **E. Coli:** The concentration of number of colony-forming units (cfu) per 100 mL was assessed at the downstream extent of each stream identified for survey following the method described in Michigan's E. coli Water Quality Standard Fact Sheet (ref. (9)). Three sampling events consisting of three grab samples each occurred within the 4-week period spanning July 10, 2024 to July 24, 2024. The geometric mean of the daily geometric means for the three sampling events was entered as the field value for this metric.
- **Total Phosphorus:** Total Phosphorus concentration (micrograms per liter (mcg/L)) was measured at the downstream extent of each stream identified for survey following methods described in the MiSQT manual (ref. (4)). Samples were collected on June 27, July 18, August 14, and September 3, 2024. The average of the concentrations measured by these events was entered as the field value for this metric.

The E. Coli and Total Phosphorus monitoring locations are the same as the Temperature and DO monitoring locations shown in Figure 6.

2.2.5 Biology Parameters

Biology parameters evaluated by Advanced Ecological Management on behalf of WPC (through a separate Aquatic Habitat and Biota Study) were provided to Barr (refer to Appendix C – Biology Data from Advanced Ecological Management) and include:

- **Macroinvertebrate Index Score:** Macroinvertebrate populations were surveyed using the Great Lakes and Environmental Assessment Section (GLEAS) Procedure 51 for wadeable streams. Methods for these procedures are outlined in P51, Qualitative Biological and Habitat Survey Protocols for Wadeable Streams and Rivers (ref. (10)).

- **Fish P51 Index Score:** Fish community surveys were conducted in each stream. Surveys were conducted according to sampling procedures outlined in Procedure 51, Qualitative Biological and Habitat Survey Protocols for Wadeable Streams and Rivers (ref. (10)). Sampling occurred in June and July 2024 during periods of stable discharge and low to moderate flow.

Biology monitoring parameter locations were in the general vicinity of the stream reaches characterized by Barr except for Caribou Creek. The biology parameter monitoring location for Caribou Creek was further upstream in the watershed south of the existing tailings dams, immediately north of the LP Walsh Road (see Appendix C -Biology Data from Advanced Ecological Management – Figure 1). The biology data collected for Caribou Creek at this location is conservative for MiSQT scoring because the channel at this location is in a more natural setting and has flow, whereas the segment of Caribou Creek immediately east of North Dam 2 was a small seep with little to no flow at the time of survey and monitoring.

2.2.6 Impounded Reaches

Reaches that were impounded due to beaver activity were evaluated based on procedures outlined by the United States Army Corps of Engineers (USACE) in the Minnesota Dam Memo (ref. (11)). The Dam Memo summarizes the method used to adapt SQT scoring to impounded streams. This procedure was used based on Barr's application of past guidance from EGLE WRD.

2.2.7 Other Parameters

Stream reaches were assessed for Strahler stream order based on NHD flowlines. Stream reaches were designated as perennial, ephemeral, or intermittent based on presence of flow during the July field survey. Bed material was categorized based on visual assessment. Channel Type was assessed by professional judgement based on Rosgen Channel Classification system (ref. (12)).

Field surveys also gathered other non-MiSQT metrics including field photos of each stream reach as well as collecting GPS points at the upstream and downstream extents of each reach, sub-reach, and representative cross section locations.

3 Survey Area MiSQT Assessment

Prior to detailed in-field assessment, potential streams identified during desktop review within the Survey Area were evaluated by performing initial stream reconnaissance to verify the presence of streams at all NHD flow line locations. During initial field reconnaissance, reach break locations were also identified to determine detailed in-field assessment locations.

Figure 3 shows all the NHD flow lines within the Survey Area. Figure 4, shows all the observed flow paths from stream reconnaissance. During initial field reconnaissance in the Survey Area, many NHD flow lines were observed to not represent streams but either areas of ponded water or areas without indication of flow. As a result, these locations did not meet the screening parameters for inclusion in the detailed field survey efforts.

Stream assessments were performed on all reaches within the Survey Area along the following streams:

- Portal Creek;
- Mineral River;
- Perch Creek;
- Pine Creek; and
- Caribou Creek.

A photolog of assessed reaches is provided in Appendix B. Figure 7 shows reach locations relative to Hydrologic Unit Code (HUC) 12 watershed boundaries.

3.1 MiSQT Scoring

The MiSQT uses function-based parameters and metrics to assess five functional categories: hydrology, hydraulics, geomorphology, physicochemical, and biology (ref. (4)).The MiSQT integrates multiple indicators from these functional categories into a reach-based total condition score, with a perfectly functioning stream scoring 1.0 and a completely not-functioning or nonexistent stream scoring 0, as defined by the MiSQT guidance manual (ref. (4)). The MiSQT divides stream conditions scores into three groups based on ecological functioning: functioning (1.0-0.7), functioning at risk (0.69-0.3), and not functioning (0.29-0). The total condition score is multiplied by the length of the stream to calculate functional feet for the reach. Functional feet are the units used to compare the loss or gain of stream resources from an impact or mitigation project.

A total of 17,362 feet of stream were evaluated as part of detailed in-field assessments. The resulting total amount of stream functional feet based on the assessments is 10,599.

Total computed functional feet contained in each stream within the Survey Area is stated in Table 3-1. A summary of the MiSQT Existing Condition Assessment is provided by stream reach (for streams in the Survey Area) in Table 3-2. Functional category scores for each stream reach are provided in Table 3-3. Full MiSQT Parameter scores and field values for each assessed stream reach are included in Appendix D.

Table 3-1 Functional Feet Summary by Stream within Survey Area

	Portal Creek	Mineral River	Perch Creek	Pine Creek	Caribou Creek
Existing Functional Feet	2,557	2,621	378	4,612	111

Table 3-2 Existing Condition Assessment by Stream Reach within Survey Area

Stream	Reach	Stream Length (feet)	Existing Condition Score	Functional Feet Score
Portal	1a	73	0.70	50
	1b	200	0.50	96
	2a	422	0.47	190
	2b	184	0.44	79
	2c	602	0.66	385
	2d	947	0.61	568
	3a	240	0.55	127
	3b	475	0.48	219
	3c	534	0.48	246
	4a	300	0.69	204
	4b	578	0.70	393
	Total	**4,555**	**0.58**	**2,557**
Mineral	7	428	0.64	265
	9a	696	0.67	452
	9b	1,287	0.66	824
	10a	231	0.68	152
	10b	281	0.68	185
	10c	1,301	0.59	742
	Total	**4,224**	**0.64**	**2,621**
Perch	11a	469	0.54	253
	11b	245	0.51	125
	Total	**714**	**0.53**	**378**
Pine	25a	369	0.72	258
	25b	716	0.53	365
	25c	316	0.55	167
	25d	417	0.64	259
	25e	1,310	0.73	930
	25g	1,182	0.59	674
	25h	1,911	0.62	1,147
	25i	1,142	0.57	628
	25z	348	0.55	184
	Total	**7,711**	**0.62**	**4,612**
Caribou	26	158	0.73	111
	Total	**158**	**0.73**	**111**

Table 3-3 Existing Condition Functional Category Scores within Survey Area

Stream	Reach	Hydrology	Hydraulics	Geomorphology	Physiochemical	Biology	Overall
Portal	**1a**	1	0.91	0.65	0.62	0.24	**0.68**
	1b	1	0	0.56	0.62	0.24	**0.48**
	2a	1	0	0.41	0.62	0.24	**0.45**
	2b	1	0	0.28	0.62	0.24	**0.43**
	2c	1	0.74	0.61	0.62	0.24	**0.64**
	2d	1	0.49	0.64	0.62	0.24	**0.60**
	3a	1	0.24	0.55	0.62	0.24	**0.53**
	3b	1	0	0.44	0.62	0.24	**0.46**
	3c	1	0	0.46	0.62	0.24	**0.46**
	4a	1	0.88	0.64	0.62	0.24	**0.68**
	4b	1	0.88	0.66	0.62	0.24	**0.68**
Mineral	**7**	1	0.07	0.77	0.89	0.37	**0.62**
	9a	1	0.38	0.62	0.89	0.37	**0.65**
	9b	1	0.38	0.58	0.89	0.37	**0.64**
	10a	1	0.43	0.63	0.89	0.37	**0.66**
	10b	1	0.5	0.54	0.89	0.37	**0.66**
	10c	0.89	0.08	0.63	0.89	0.37	**0.57**
Perch	**11a**	1	0	0.52	0.88	0.29	**0.54**
	11b	1	0	0.36	0.88	0.29	**0.51**
Pine	**25a**	1	0.84	0.58	0.61	0.45	**0.70**
	25b	1	0	0.5	0.61	0.45	**0.51**
	25c	1	0	0.59	0.61	0.45	**0.53**
	25d	1	0.5	0.55	0.61	0.45	**0.62**
	25e	1	0.84	0.63	0.61	0.45	**0.71**
	25g	1	0	0.81	0.61	0.45	**0.57**
	25h	1	0.36	0.59	0.61	0.45	**0.60**
	25i	1	0	0.68	0.61	0.45	**0.55**
	25z	1	0	0.59	0.61	0.45	**0.53**
Caribou	**26**	1	1	0.59	0.59	0.32	**0.7**

*Cell color indicates functional condition of stream based on MiSQT Score: green – functioning (1.0-0.7), yellow – functioning at risk(0.69-0.3), or red – not functioning(0.29-0).

3.2 Portal Creek

Portal Creek is a tributary to the Mineral River. Within the survey Area, Portal Creek is located along the southwest and western edge of North Dam 1. A total of 11 unique reaches were identified on Portal Creek within the Survey Area. Overall existing conditions scores for Portal Creek subreaches ranged from a low of 0.43 to a high of 0.68. A summary of the MiSQT Existing Condition Assessment Parameter and Category scores are provided in Appendix D.

3.2.1 Reach 1a (Portal Creek) Summary

Reach 1a is a first-order, perennial, gravel-bedded, E-type stream that flows through a forested area. The reach is 73 feet long with a channel bed slope of 1.8%. The upstream reach break criterion was a triple barrel culvert. The downstream reach break criterion was a change in valley type. The existing conditions result in an overall functional score of 0.68 and a reach length of 50 functional feet.

3.2.2 Reach 1b (Portal Creek) Summary

Reach 1b is a first-order, perennial, silt and clay-bedded, G-type stream that flows through a forested area. The reach is 200 feet long with a channel bed slope of 1.3%. The upstream reach break criterion was a change in valley type. The downstream reach break criterion was the extent of the Survey Area boundary. The existing conditions result in an overall functional score of 0.48 and a reach length of 96 functional feet.

3.2.3 Reach 2a (Portal Creek) Summary

Reach 2a is a first-order, perennial, silt and clay-bedded, C-type stream that flows through a forested area. It is impounded due to beaver activity. The reach is 422 feet long. The upstream reach break criterion was the extent of the Survey Area. The downstream reach break criterion was a beaver dam. The existing conditions result in an overall functional score of 0.45 and a reach length of 190 functional feet.

3.2.4 Reach 2b (Portal Creek) Summary

Reach 2b is a first-order, perennial, silt and clay-bedded, C-type stream that flows through a forested area. It is impounded due to beaver activity. The reach is 184 feet long. The upstream and downstream reach break criteria were beaver dams. The existing conditions result in an overall functional score of 0.43 and a reach length of 79 functional feet.

3.2.5 Reach 2c (Portal Creek) Summary

Reach 2c is a first-order, perennial, silt and clay-bedded, Bc-type stream that flows through a forested area. The reach is 602 feet long with a channel bed slope of 1.6%. The upstream reach break criterion was a beaver dam. The downstream reach break criterion was a change in valley type. The existing conditions result in an overall functional score of 0.64 and a reach length of 385 functional feet.

3.2.6 Reach 2d (Portal Creek) Summary

Reach 2d is a first-order, perennial, silt and clay-bedded, C-type stream that flows through a forested area. The reach is 947 feet long with a channel bed slope of 0.5%. The upstream reach break criterion

was a change in valley type. The downstream reach break criterion was a culvert. The existing conditions result in an overall functional score of 0.60 and a reach length of 568 functional feet.

3.2.7 Reach 3a (Portal Creek) Summary

Reach 3a is a first-order, perennial, gravel-bedded, C-type stream that flows through a forested area. The reach is 240 feet long with a channel bed slope of 1.8%. The upstream reach break criterion was a culvert. The downstream reach break criterion was the start of a beaver impoundment. The existing conditions result in an overall functional score of 0.53 and a reach length of 127 functional feet.

3.2.8 Reach 3b (Portal Creek) Summary

Reach 3b is a first-order, perennial, silt and clay-bedded, C-type stream that flows through a forested area. It is impounded due to beaver activity. The reach is 475 feet long. The upstream reach break criterion was the start of a beaver impoundment. The downstream reach break criterion was a beaver dam. The existing conditions result in an overall functional score of 0.46 and a reach length of 219 functional feet.

3.2.9 Reach 3c (Portal Creek) Summary

Reach 3c is a first-order, perennial, silt and clay-bedded, C-type stream that flows through a forested area. It is impounded due to beaver activity. The reach is 534 feet long. The upstream and downstream reach break criteria were beaver dams. The existing conditions result in an overall functional score of 0.46 and a reach length of 246 functional feet.

3.2.10 Reach 4a (Portal Creek) Summary

Reach 4a is a first-order, perennial, silt and clay-bedded, E-type stream that flows through a forested area. The reach is 300 feet long with a channel bed slope of 3.1%. The upstream and downstream reach break criteria were beaver dams. The existing conditions result in an overall functional score of 0.68 and a reach length of 204 functional feet.

3.2.11 Reach 4b (Portal Creek) Summary

Reach 4b is a first-order, perennial, silt and clay-bedded, E-type stream that flows through a forested area. The reach is 578 feet long with a channel bed slope of 3.1%. The upstream reach break criterion was a beaver dam. The downstream reach break criterion was the extent of the Survey Area. The existing conditions result in an overall functional score of 0.68 and a reach length of 393 functional feet.

3.3 Mineral River

Within the Survey Area, the Mineral River is located along the western edge of North Dam 2 (adjacent to the northwest corner). A total of six subreaches were identified on the Mineral River within the Survey Area. Overall existing conditions scores of Mineral River subreaches ranged from a low of 0.57 to a high of 0.66. A summary of the MiSQT Existing Condition Assessment Parameter and Category scores are provided in Appendix D.

3.3.1 Reach 7 (Mineral River) Summary

Reach 7 is a third-order, perennial, gravel-bedded, Bc-type stream that flows through a forested area. The reach is 428 feet long with a channel bed slope of 0.3%. The upstream and downstream reach break

criteria were the extent of the Survey Area. The existing conditions result in an overall functional score of 0.62 and a reach length of 265 functional feet.

3.3.2 Reach 9a (Mineral River) Summary

Reach 9a is a third-order, perennial, bedrock bed, Bc-type stream that flows through a forested area. The reach is 696 feet long with a channel bed slope of 0.3%. The upstream and downstream reach break criteria were the extent of the Survey Area. The existing conditions result in an overall functional score of 0.65 and a reach length of 452 functional feet.

3.3.3 Reach 9b (Mineral River) Summary

Reach 9b is a third-order, perennial, bedrock bed, Bc-type stream that flows through a forested area. The reach is 1,287 feet long with a channel bed slope of 0.3%. The upstream reach break criterion was the extent of the Survey Area. The downstream reach break criteria was a change in bed slope, bed material and riparian vegetation. The existing conditions result in an overall functional score of 0.64 and a reach length of 824 functional feet.

3.3.4 Reach 10a (Mineral River) Summary

Reach 10a is a third-order, perennial, boulder-bedded, Bc-type stream that flows through a forested area. The reach is 231 feet long with a channel bed slope of 2.2%. The upstream reach break criterion was a change in bed slope, bed material, and riparian vegetation. The downstream reach break criterion was a culvert. The existing conditions result in an overall functional score of 0.66 and a reach length of 152 functional feet.

3.3.5 Reach 10b (Mineral River) Summary

Reach 10b is a third-order, perennial, sand-bedded, Bc-type stream that flows through an herbaceous area likely caused by road construction and maintenance. The reach is 281 feet long with a channel bed slope of 1.0%. The upstream reach break criterion was a culvert. The downstream reach break criterion was a change in riparian vegetation. The existing conditions result in an overall functional score of 0.66 and a reach length of 185 functional feet.

3.3.6 Reach 10c (Mineral River) Summary

Reach 10c is a third-order, perennial, cobble-bedded, Bc-type stream that flows through a forested area. The reach is 1,301 feet long with a channel bed slope of 1.5%. The upstream reach break criterion was a change in riparian vegetation. The downstream reach break criterion was the extent of the Survey Area. The existing conditions result in an overall functional score of 0.57 and a reach length of 742 functional feet.

3.4 Perch Creek

Within the Survey Area, Perch Creek is located north of North Dam 2 (adjacent to the northwest corner). Perch Creek is the receiving water of the National Pollutant Discharge Elimination System (NPDES) permitted outfall location 001A (Permit No. MI0006114). A total of two subreaches were identified on sections of this stream within the Survey Area. Overall existing conditions scores of Perch Creek subreaches ranged from a low of 0.51 to a high of 0.54. A summary of the MiSQT Existing Condition Assessment Parameter and Category scores are provided in Appendix D.

3.4.1 Reach 11a (Perch Creek) Summary

Reach 11a is a first-order, perennial, cobble-bedded, F-type stream that flows through a forested area. The reach is 469 feet long with a channel bed slope of 1.1%. The upstream reach break criterion was an outlet structure for the North Dam 2 Stormwater Management System. The downstream reach break criterion was the start of a beaver impoundment. The existing conditions result in an overall functional score of 0.54 and a reach length of 253 functional feet.

3.4.2 Reach 11b (Perch Creek) Summary

Reach 11b is a first-order, perennial, sand-bedded, F-type stream that flows through a forested area. It is an impounded reach due to beaver activity. The reach is 245 feet long. The upstream reach break criterion was the start of a beaver impoundment. The downstream reach break criterion was the extent of the Survey Area. The existing conditions result in an overall functional score of 0.51 and a reach length of 125 functional feet.

3.5 Pine Creek

Within the Survey Area, Pine Creek is located along the east side of North Dam 2. A total of nine subreaches were identified on the sections of Pine Creek within the Survey Area. Overall existing conditions scores of Pine Creek subreaches ranged from a low of 0.51 to a high of 0.71. A summary of the MiSQT Existing Condition Assessment Parameter and Category scores are provided in Appendix D.

3.5.1 Reach 25z (Pine Creek) Summary

Reach 25z is a second-order, perennial, sand-bedded, C-type stream that flows through a forested area. The reach is 348 feet long with a channel bed slope of 0.6%. The upstream reach break criterion was a change in riparian vegetation and bed slope. The downstream reach break criterion was the extent of the Survey Area. The existing conditions result in an overall functional score of 0.53 and a reach length of 184 functional feet.

3.5.2 Reach 25a (Pine Creek) Summary

Reach 25a is a second-order, perennial, boulder-bedded, C-type stream that flows through a shrub-scrub area. The reach is 369 feet long with a channel bed slope of 2.9%. The upstream reach break criterion was a beaver dam. The downstream reach break criteria were a change in riparian vegetation and bed slope. The existing conditions result in an overall functional score of 0.70 and a reach length of 258 functional feet.

3.5.3 Reach 25b (Pine Creek) Summary

Reach 25b is a second-order, perennial, sand-bedded, C-type stream that flows through a shrub-scrub area. It is an impounded reach due to beaver activity. The reach is 716 feet long. The upstream reach break criterion was the start of a beaver impoundment. The downstream reach break criterion was a beaver dam. The existing conditions result in an overall functional score of 0.51 and a reach length of 365 functional feet.

3.5.4 Reach 25c (Pine Creek) Summary

Reach 25c is a second-order, perennial, bedrock-bedded, C-type stream that flows through a scrub-shrub area. The reach is 316 feet long with a channel bed slope of 1.2%. The upstream reach break criterion was a change in riparian vegetation. The downstream reach break criterion was the start of a beaver impoundment. The existing conditions result in an overall functional score of 0.53 and a reach length of 167 functional feet.

3.5.5 Reach 25d (Pine Creek) Summary

Reach 25d is a second-order, perennial, bedrock-bedded, C-type stream that flows through a forested area. The reach is 417 feet long with a channel bed slope of 0.9%. The upstream and downstream reach break criteria were changes in riparian vegetation. The existing conditions result in an overall functional score of 0.62 and a reach length of 259 functional feet.

3.5.6 Reach 25e (Pine Creek) Summary

Reach 25e is a second-order, perennial, bedrock-bedded, C-type stream that flows through a scrub-shrub area. The reach is 1,310 feet long with a channel bed slope of 0.9%. The upstream reach break criteria was a change in valley type and bed material. The downstream reach break criterion was a change in riparian vegetation. The existing conditions result in an overall functional score of 0.71 and a reach length of 930 functional feet.

3.5.7 Reach 25g (Pine Creek) Summary

Reach 25g is a second-order, perennial, sand-bedded, C-type stream that flows through a forested area. The reach is 1,182 feet long with a channel bed slope of 1.3%. The upstream and downstream reach break criteria were changes in valley type and bed material. The existing conditions result in an overall functional score of 0.57 and a reach length of 674 functional feet.

3.5.8 Reach 25h (Pine Creek) Summary

Reach 25h is a second-order, perennial, cobble-bedded, C-type stream that flows through a forested area. The reach is 1,911 feet long with a channel bed slope of 0.6%. The upstream reach break criterion was a change in bed material. The downstream reach break criterion was a change in valley type and bed material. The existing conditions result in an overall functional score of 0.60 and a reach length of 1,147 functional feet.

3.5.9 Reach 25i (Pine Creek) Summary

Reach 25i is a second-order, perennial, sand-bedded, C-type stream that flows through a forested area. The reach is 1,142 feet long with a channel bed slope of 0.7%. The upstream reach break criterion was the extent of the survey area. The downstream reach break criterion was a change in bed material. The existing conditions result in an overall functional score of 0.55 and a reach length of 628 functional feet.

3.6 Caribou Creek

Caribou Creek is a tributary to Pine Creek. Within the Survey Area, Caribou Creek is located along the east side of North Dam 2. One subreach was identified on this stream within the Survey Area. The overall

existing conditions score of Caribou Creek was 0.70. A summary of the MiSQT Existing Condition Assessment Parameter and Category scores are provided in Appendix D.

3.6.1 Reach 26 (Caribou Creek) Summary

Reach 26 is a first-order, perennial, silt/clay-bedded, E-type stream that flows through a forested area. The reach is 158 feet long with a channel bed slope of 0.9%. The upstream reach break criterion was a beaver dam. The downstream reach break criterion was the confluence with Pine Creek. The existing conditions result in an overall functional score of 0.70 and a reach length of 111 functional feet.

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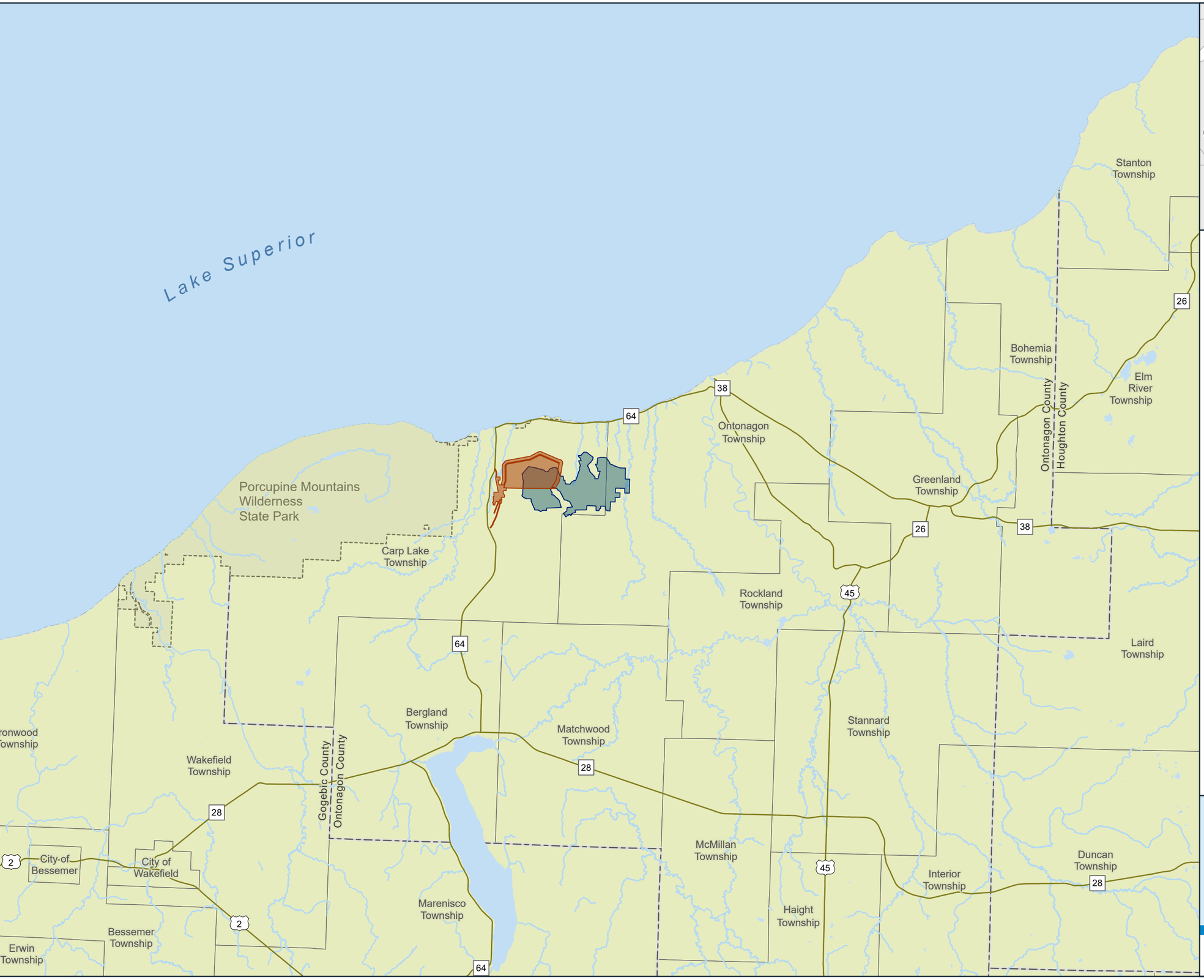
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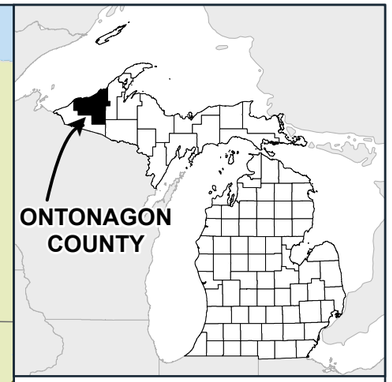
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Figures





- Proposed Surface Facilities
- Proposed Underground Mine Area
- Porcupine Mountains Wilderness State Park
- Municipal Boundary

N

0 5 10
Miles

Basemap: World Street Map (Esri)

Site Location
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

FIGURE 1

BARR

Barr Footer: ArcGISPro 3.4, 2025-01-09 14:05 File: I:\Projects\22\66\1013\Maps\Reports\Streams_Report\Streams_Report.aprx Layout: Fig01 Site Location User: CML3

Proposed Transmission Line Corridor

Potential Tailings Dam Expansion Area

Existing North Dam 2

Proposed Surface Footprint

Existing North Dam 1

Proposed Railroad Corridor

Proposed Underground Mine Area

TEN MILE TPKE

HALFWAY RIVER RD

TOWNLINE RD

QUARTZ RD

L P WALSH RD

POTATO FARM RD

M 64

Carp Lake Township

Ontonagon Township

Survey Area

Surface Rights Extent

Proposed Underground Mine Area

Potential Tailings Dam Expansion Area

Proposed Surface Footprint

Proposed Transmission Line Corridor

Proposed Railroad Corridor

N

0 3,000 6,000

Feet

Imagery: USDA NAIP 2022

Site Layout
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

FIGURE 2

BARR

Barr Footer: ArcGISPro 3.4, 2025-01-09 14:05 File: I:\Projects\23\666\0131\Maps\Reports\Streams_Report\Streams_Report.aprx Layout: Fig02 Site Layout User: CML3



Survey Area

Proposed Underground Mine Area

Potential Stream Location in Survey Area (NHD)

Flowline (NHD)

50-ft Contour

10-ft Contour

Potential Streams in the Survey Area	
Name	**Length (Miles)**
Perch Creek	2.18
Bedell Creek	0.71
Caribou Creek	0.51
Miles Creek	0.18
Mineral River	0.74
Native Creek	0.01
Patent Creek	0.24
Pine Creek	1.40
Portal Creek	0.79
Stony Creek	0.21
TOTAL:	**6.96**

0 1,800 3,600

Feet

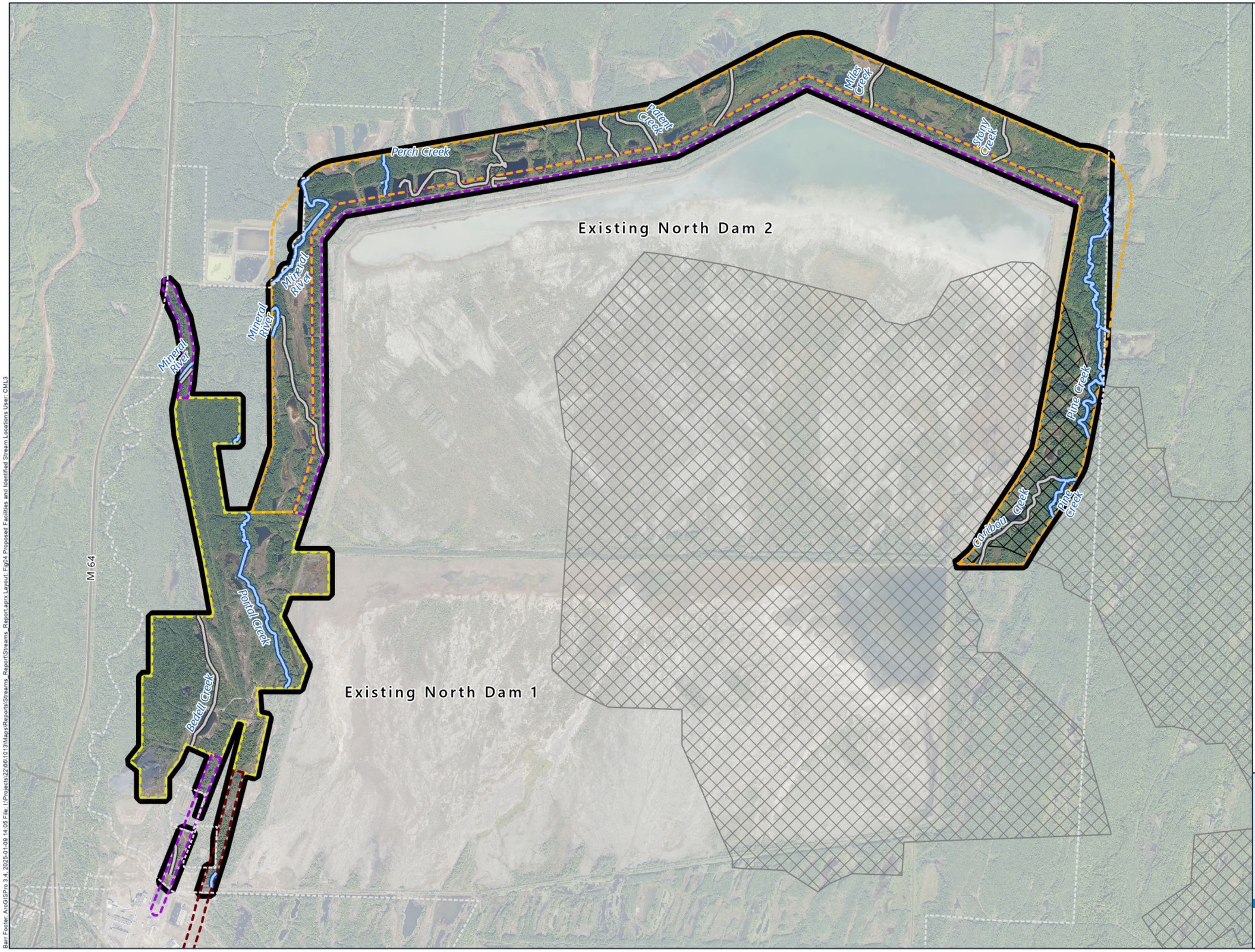
Imagery: USDA NAIP 2022

NHD Stream Locations
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

FIGURE 3

BARR

Barr Footer: ArcGISPro 3.4, 2025-01-09 14:05 File: I:\Projects\22\66\1013\Maps\Reports\Streams_Report\Streams_Report.aprx Layout: Fig03 Stream Locations User: CML3



Survey Area
Surface Rights Extent
Proposed Underground Mine Area
Existing North Dam 2
Potential Tailings Dam Expansion Area
Proposed Surface Footprint
Proposed Railroad Corridor
Proposed Transmission Line Corridor

Survey Stream Locations
Stream observed during reconnaissance
No stream observed during reconnaissance

N

0 1,800 3,600
Feet

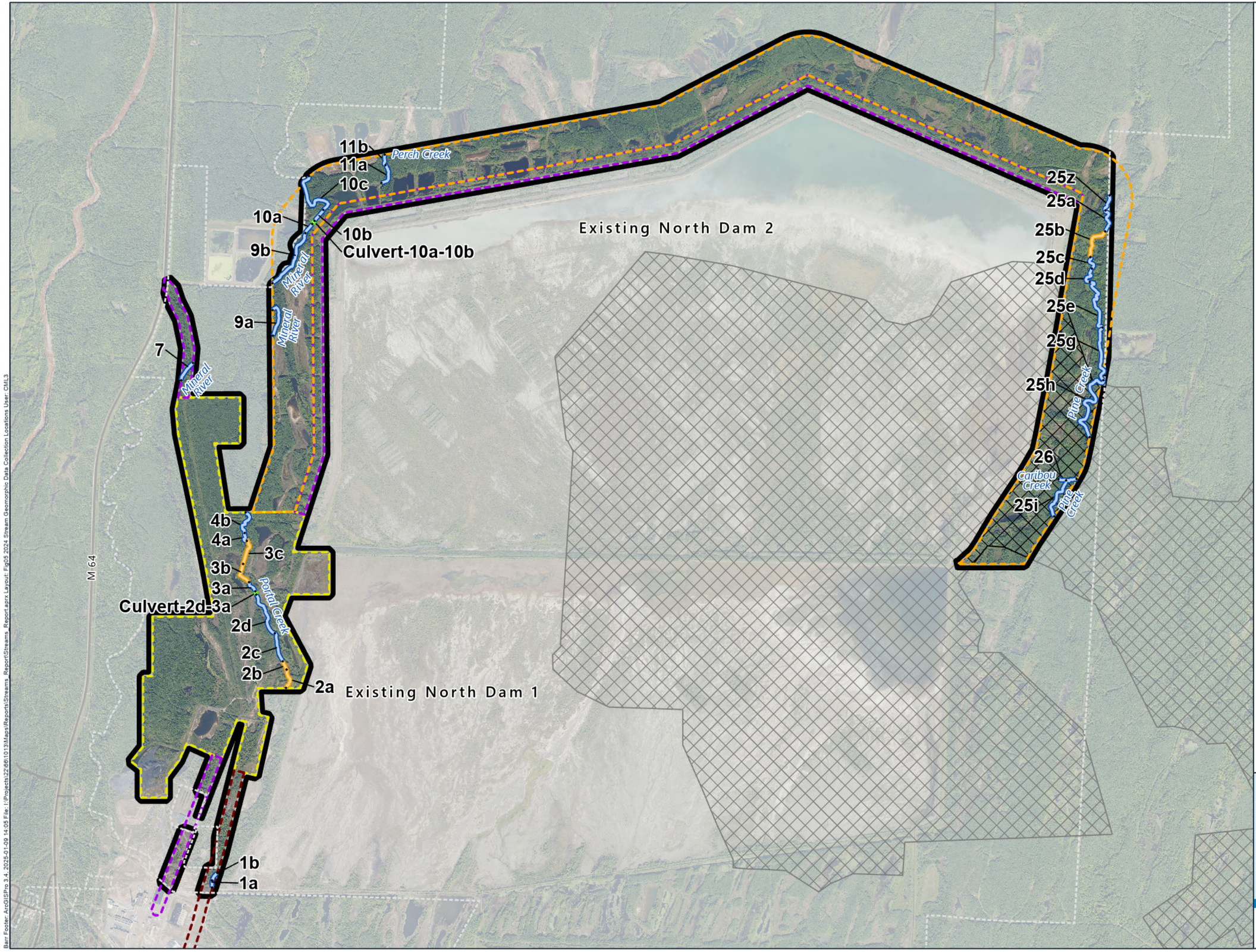
Imagery: USDA NAIP 2022

Proposed Facilities and Identified Stream Locations
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

FIGURE 4

BARR

Barr Footer: ArcGISPro 3.4, 2025-01-09 14:05 File: I:\Projects\22\66\1013\Maps\Reports\Streams_Report\Streams_Report.aprx Layout: Fig04 Proposed Facilities and Identified Stream Locations User: CML3

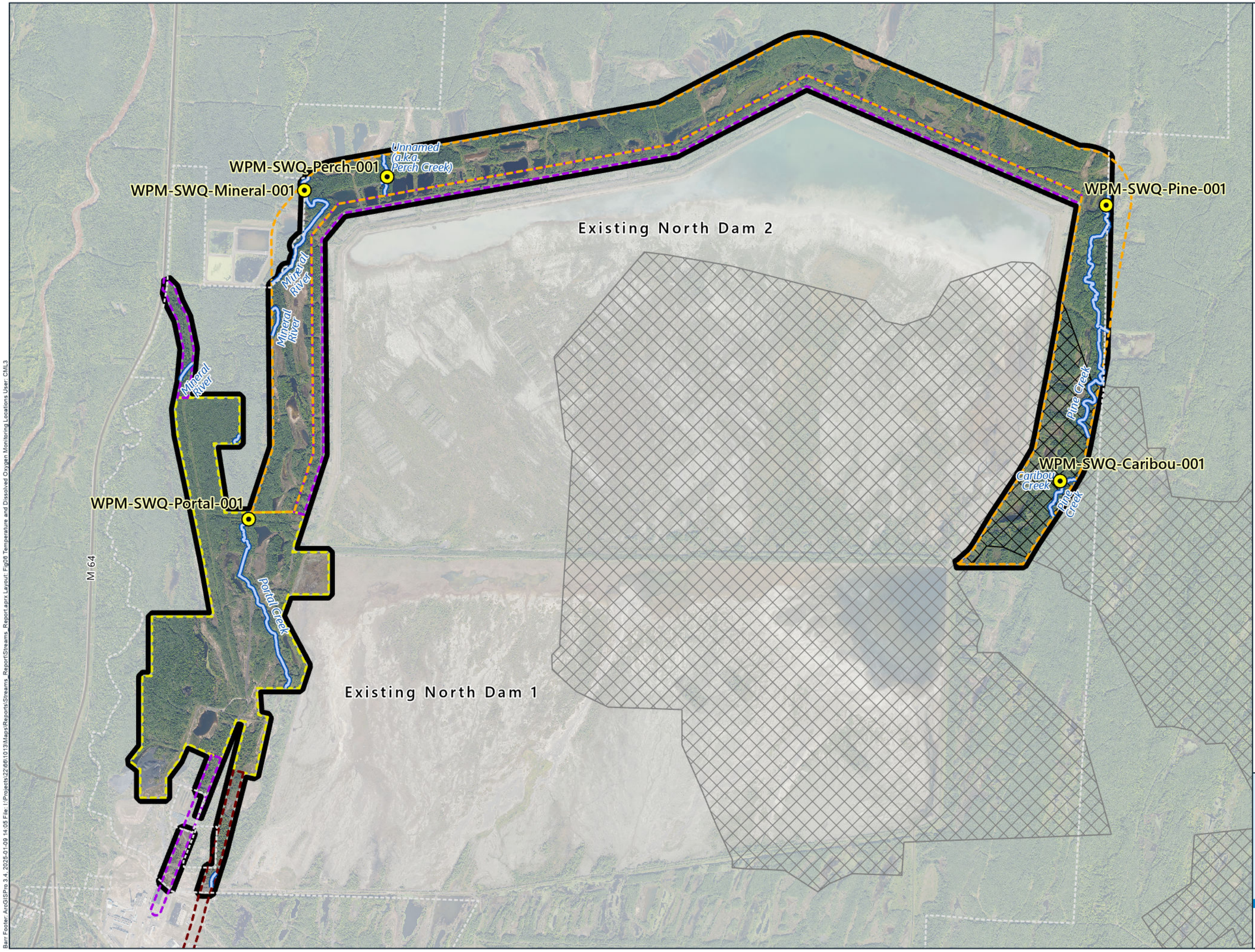


2024 Stream Geomorphic Data Collection Locations
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

FIGURE 5

BARR

Barr Footer: ArcGISPro 3.4, 2025-01-09 14:05 File: I:\Projects\22\661013\Maps\Reports\Streams_Report\Streams_Report.aprx Layout: Fig05 2024 Stream Geomorphic Data Collection Locations User: CML3



Survey Area
Surface Rights Extent
Proposed Underground Mine Area
Existing North Dam 2
Potential Tailings Dam Expansion Area
Proposed Surface Footprint
Proposed Railroad Corridor
Proposed Transmission Line Corridor
Surveyed Stream
Approx. Temperature and DO Monitoring Location

N

0 1,800 3,600
Feet

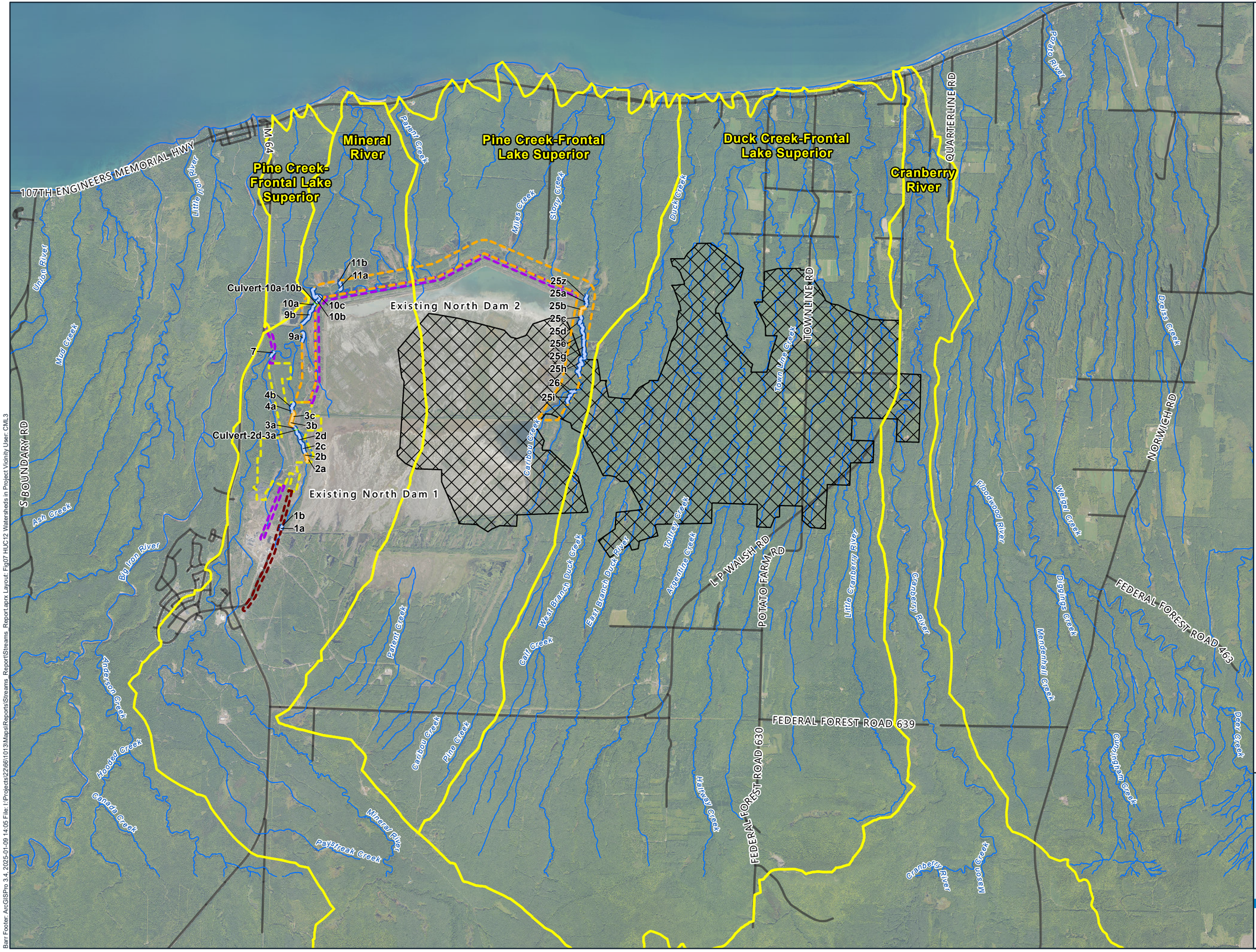
Imagery: USDA NAIP 2022

Physiochemical Parameter Monitoring Locations
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

FIGURE 6

BARR

Barr Foster ArcGISPro 3.4, 2025-01-09 14:05 File: I:\Projects\22\66\1013\Maps\Reports\Streams_Report\Streams_Report.aprx Layout: Fig06 Temperature and Dissolved Oxygen Monitoring Locations User: CML3



HUC 12 Watershed
NHD Flowline
Proposed Underground Mine Area
Potential Tailings Dam Expansion Area
Proposed Surface Footprint
Proposed Railroad Corridor
Proposed Transmission Line Corridor

Surveyed Streams
Stream
Impoundment
Culvert

N

0 1 2
Miles

Imagery: USDA NAIP 2022

HUC 12 Watersheds in Project Vicinity
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

FIGURE 7

BARR

Barr Footer: ArcGISPro 3.4, 2025-01-09 14:05 File: I:\Projects\22\68\1013\Maps\Reports\Streams_Report\Streams_Report.aprx Layout: Fig07 HUC12 Watersheds in Project Vicinity User: CML3

Appendices

Appendix A

Stream Reconnaissance Photo Log

Stream Reconaissance Photo Log Index

Photo Location	Pages
Stormwater System	1 - 4
Bedell Creek	5 - 12
Portal Creek	13 - 29
Unnamed 3	30 - 31
Mineral River	32 - 41
Perch Creek	42 - 46
Unnamed 5	47
Native Creek	48 - 49
Unnamed 6	50
Unnamed 7	51
Patent Creek	52
Unnamed 8	53
Miles Creek	54 - 57
Stony Creek	58 - 59
Pine Creek	60 - 99
Caribou Creek	100 - 107

Creek Name: Stormwater System Reach: NA

Photo 1-1



Photo caption: Stormwater Ditch Looking Downstream

Photo 1-2



Photo caption: Stormwater Ditch Looking Upstream

Photo 1-3



Photo caption: Outlet Structure to Stormwater System

Photo Locations Overview

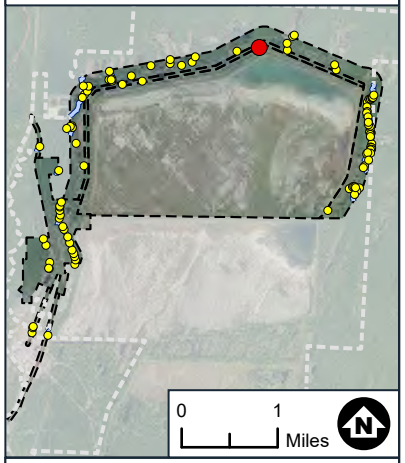


Photo 1 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Stormwater System Reach: NA

Photo 2-1



Photo caption: Connection Between Ponds

Photo Locations Overview

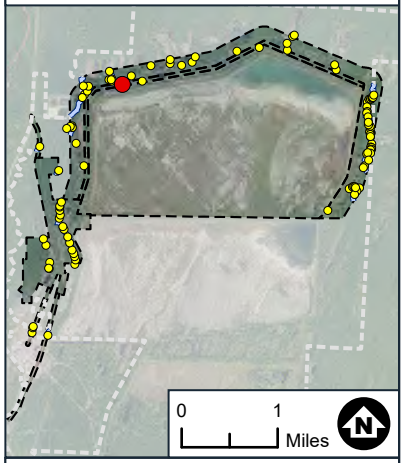


Photo 2 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Stormwater System Reach: NA

Photo 3-1



Photo caption: Stormwater Pond

Photo Locations Overview

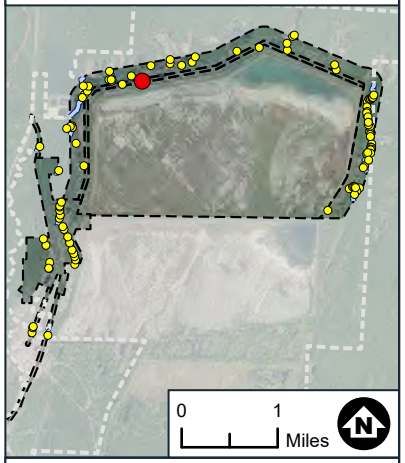


Photo 3 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Stormwater System Reach: NA

Photo 4-1



Photo caption: Stormwater Pond

Photo 4-2



Photo caption: Stormwater Pond

Photo Locations Overview

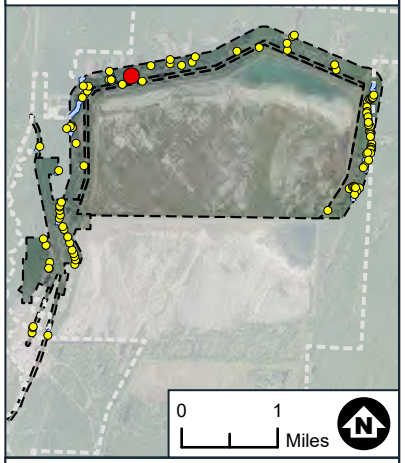


Photo 4 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Bedell Creek Reach: NA

Photo 5-1



Photo caption: Stagnant Water Present

Photo 5-2



Photo caption: Stagnant Water Present

Photo 5-3



Photo caption: Stagnant Water Present

Photo Locations Overview

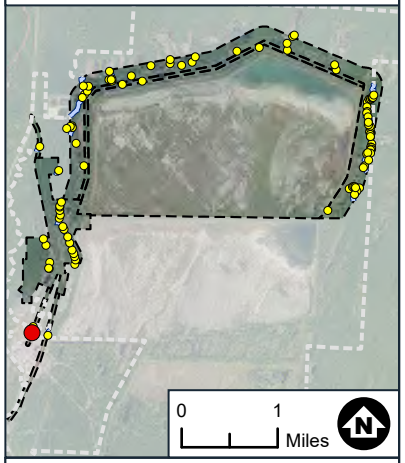


Photo 5 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Bedell Creek Reach: NA

Photo 6-1



Photo caption: Blocked Culvert Outlet

Photo Locations Overview

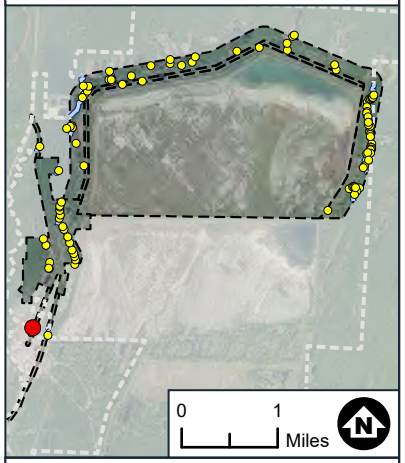


Photo 6 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Bedell Creek Reach: NA

Photo 7-1



Photo caption: General Site Photo

Photo Locations Overview

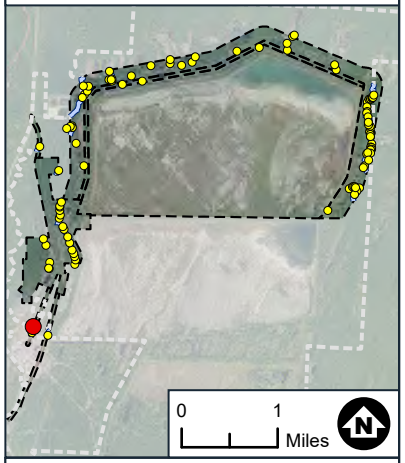


Photo 7 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Bedell Creek Reach: NA

Photo 8-1



Photo caption: Beaver Impoundment Backwater

Photo 8-2



Photo caption: Beaver Impoundment Backwater

Photo 8-3



Photo caption: Beaver Impoundment Backwater

Photo Locations Overview

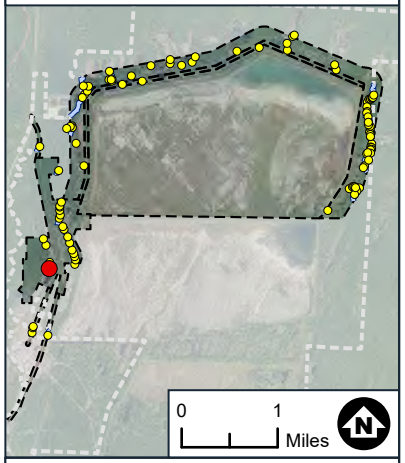


Photo 8 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Bedell Creek Reach: NA

Photo 9-1



Photo caption: Beaver Impoundment

Photo 9-2



Photo caption: Beaver Impoundment

Photo 9-3



Photo caption: Beaver Impoundment

Photo 9-4



Photo caption: Beaver Impoundment

Photo Locations Overview

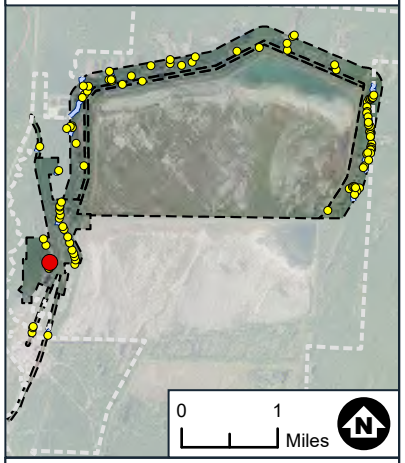


Photo 9 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Bedell Creek Reach: NA

Photo 10-1



Photo caption: Pond

Photo 10-2



Photo caption: Pond

Photo 10-3



Photo caption: Pond

Photo 10-4



Photo caption:

Photo Locations Overview

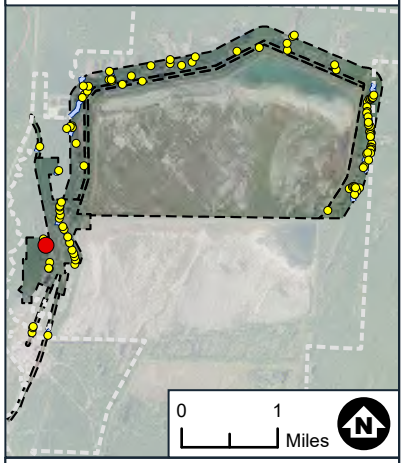


Photo 10 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Bedell Creek Reach: NA

Photo 11-1



Photo caption: Pond

Photo 11-2



Photo caption: Pond

Photo Locations Overview

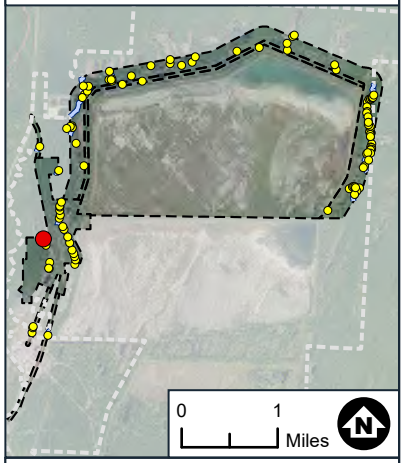


Photo 11 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Bedell Creek Reach: NA

Photo 12-1



Photo caption: Backwater from Pond

Photo 12-2



Photo caption: Backwater from Pond

Photo Locations Overview

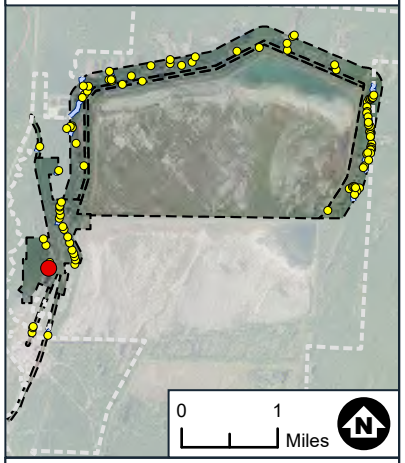


Photo 12 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Portal Creek Reach: 1a

Photo 13-1



Photo caption: Looking Downstream from Culvert

Photo 13-2



Photo caption: Looking Upstream at Culvert

Photo 13-3



Photo caption: Looking Downstream

Photo 13-4



Photo caption: Looking Downstream

Photo Locations Overview

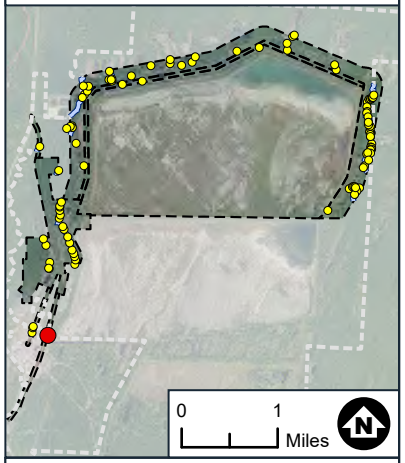


Photo 13 Location



Stream Survey Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Portal Creek Reach: 2

Photo 14-1



Photo caption: Looking Downstream

Photo Locations Overview

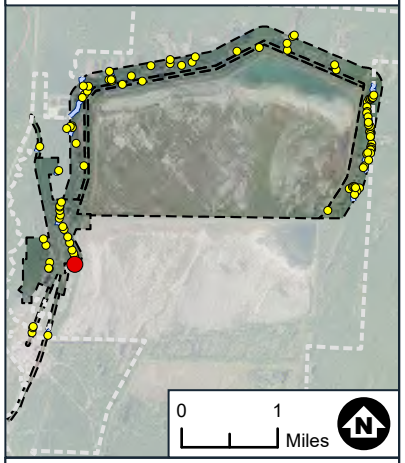


Photo 14 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Portal Creek Reach: 2

Photo 15-1



Photo caption: Looking Downstream

Photo Locations Overview

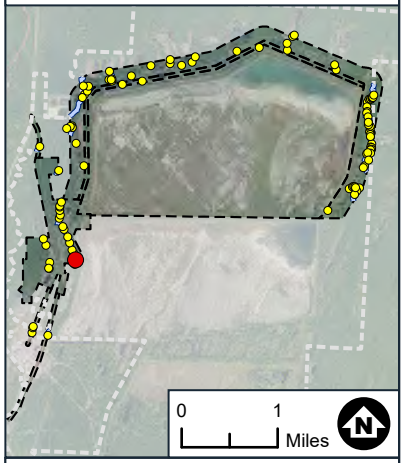


Photo 15 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Portal Creek Reach: Reach Break Between 2a and 2b

Photo 16-1



Photo caption: Beaver Dam

Photo 16-2



Photo caption: Looking Downstream at Beaver Dam

Photo Locations Overview

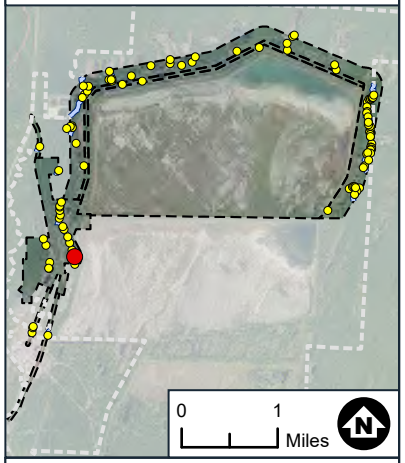


Photo 16 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Portal Creek Reach: Reach Break Between 2b and 2c

Photo 17-1



Photo caption: Looking Upstream at Beaver Dam

Photo 17-2



Photo caption: Looking Upstream

Photo Locations Overview

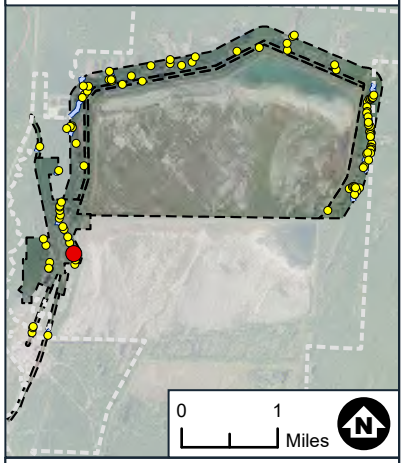


Photo 17 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Portal Creek Reach: 2

Photo 18-1



Photo caption: Looking Upstream

Photo 18-2



Photo caption: General Site Photo

Photo 18-3



Photo caption: General Site Photo

Photo Locations Overview

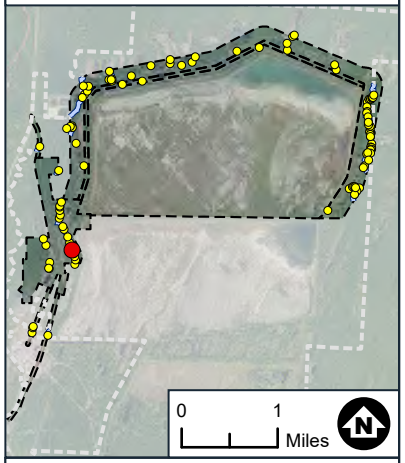


Photo 18 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Portal Creek Reach: 2c

Photo 19-1



Photo caption: Pipeline Above Stream and Old Culvert Present

Photo Locations Overview

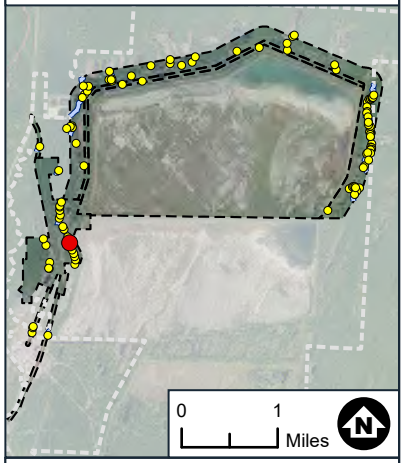


Photo 19 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Portal Creek Reach: 2d

Photo 20-1



Photo caption: General Site Photo

Photo Locations Overview

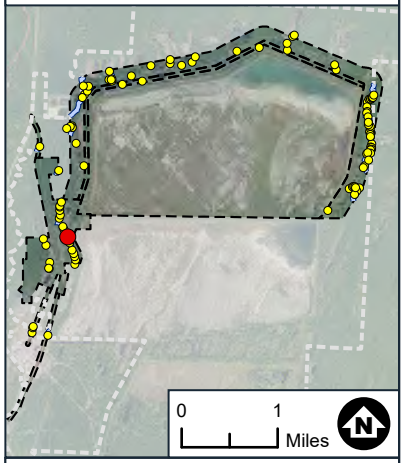


Photo 20 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Portal Creek Reach: Reach Break between 2d and 3a

Photo 21-1



Photo caption: Culvert Inlet

Photo 21-2



Photo caption: Culvert Outlet

Photo Locations Overview

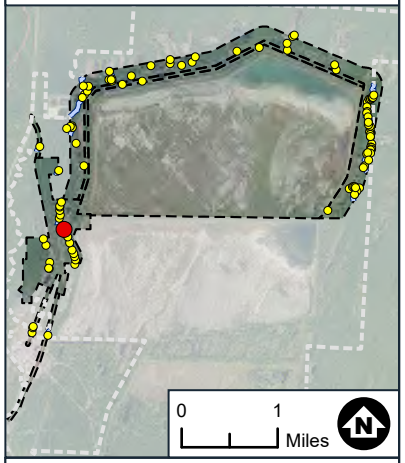


Photo 21 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Portal Creek Reach: 3a

Photo 22-1



Photo caption: Looking Upstream

Photo 22-2



Photo caption: Data Logger

Photo Locations Overview

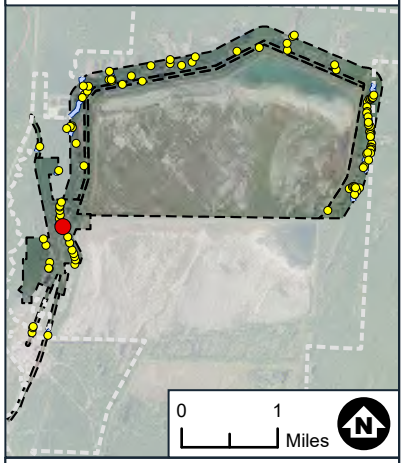


Photo 22 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Portal Creek Reach: Reach Break between 3b and 3c

Photo 23-1



Photo caption: Looking Downstream at Beaver Dam

Photo 23-2



Photo caption: Beaver Dam

Photo 23-3



Photo caption: Looking Downstream from Beaver Dam

Photo Locations Overview

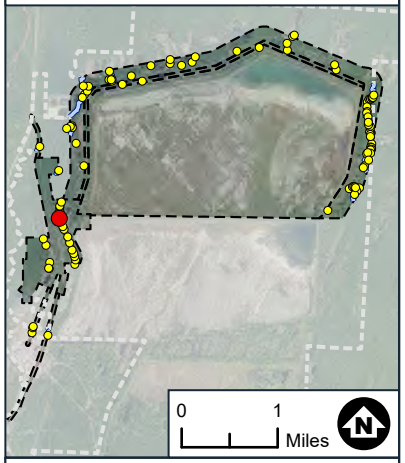


Photo 23 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Portal Creek Reach: Reach Break Between 3c and 4a

Photo 24-1



Photo caption: Former Beaver Dam

Photo 24-2



Photo caption: Looking Upstream at Beaver Dam

Photo 24-3



Photo caption: Looking Downstream from Beaver Dam

Photo Locations Overview

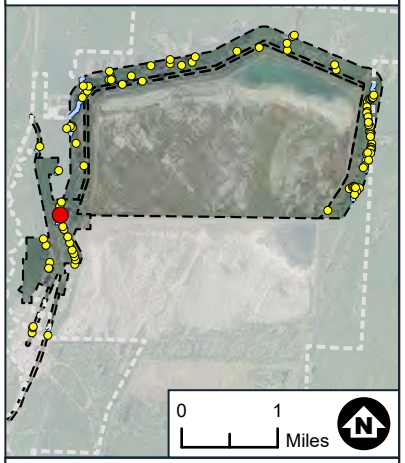


Photo 24 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Portal Creek Reach: 4a

Photo 25-1



Photo caption: General Site Photo

Photo 25-2



Photo caption: General Site Photo

Photo Locations Overview

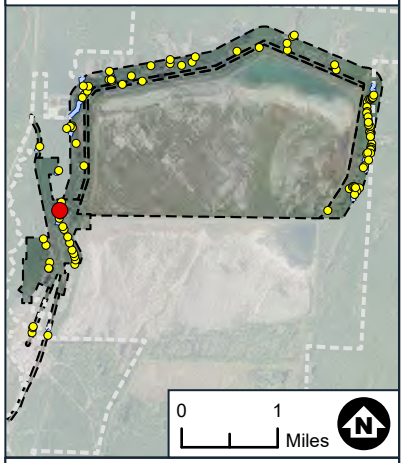


Photo 25 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Portal Creek Reach: Reach Break Between 4a and 4b

Photo 26-1



Photo caption: Looking Upstream at Beaver Dam

Photo 26-2



Photo caption: General Site Photo

Photo 26-3



Photo caption: General Site Photo

Photo Locations Overview

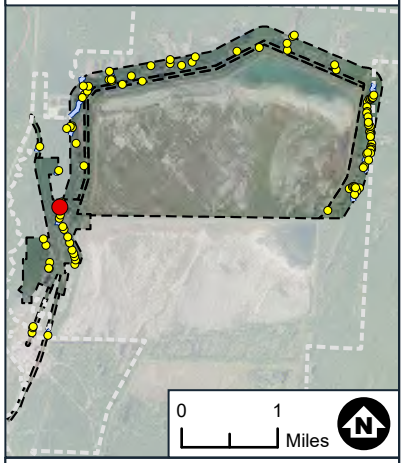
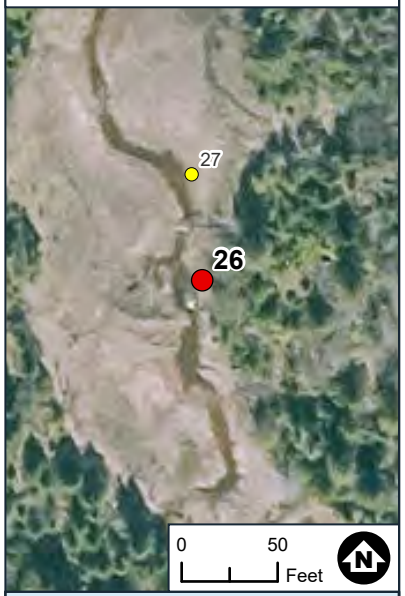


Photo 26 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Portal Creek Reach: 4b

Photo 27-1



Photo caption: General Site Photo

Photo 27-2



Photo caption: General Site Photo

Photo 27-3



Photo caption: General Site Photo

Photo 27-4



Photo caption: General Site Photo

Photo Locations Overview

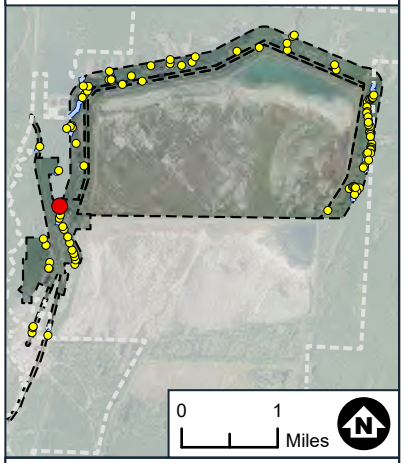
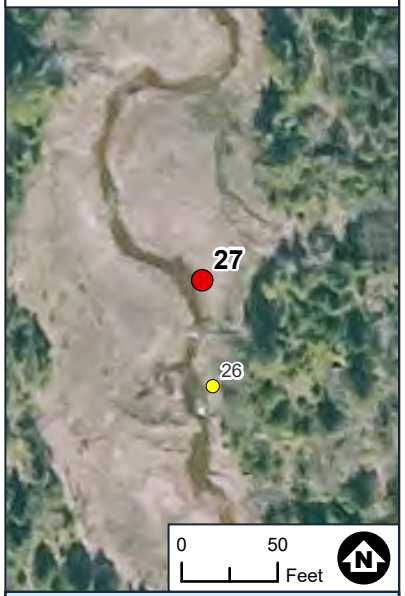


Photo 27 Location



Stream Survey Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Portal Creek Reach: 4b

Photo 28-1



Photo caption: Looking Upstream at Beaver Dam

Photo 28-2



Photo caption: Approximate Temp/DO Logger Location

Photo Locations Overview

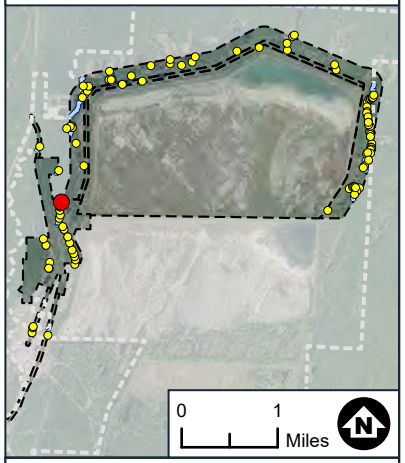


Photo 28 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Portal Creek Reach: NA

Photo 29-1



Photo caption: General Site Photo

Photo Locations Overview

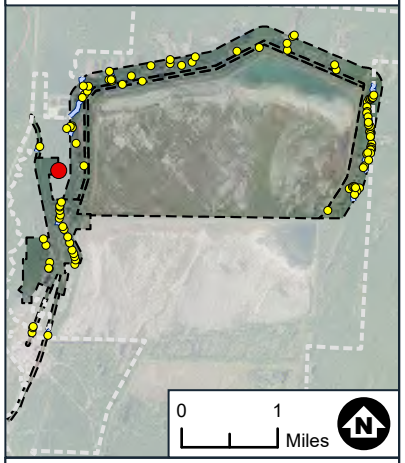


Photo 29 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Unnamed 3 Reach: NA

Photo 30-1



Photo caption: General Site Photo

Photo Locations Overview

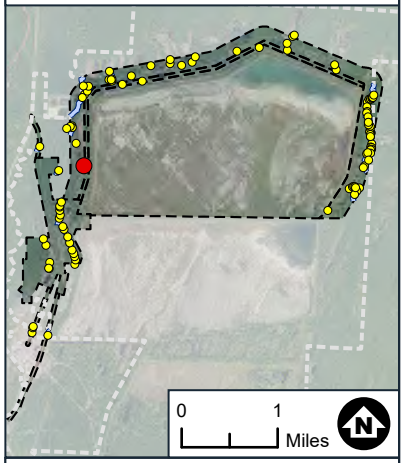


Photo 30 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Unnamed 3 Reach: NA

Photo 31-1



Photo caption: General Site Photo

Photo 31-2



Photo caption: General Site Photo

Photo Locations Overview

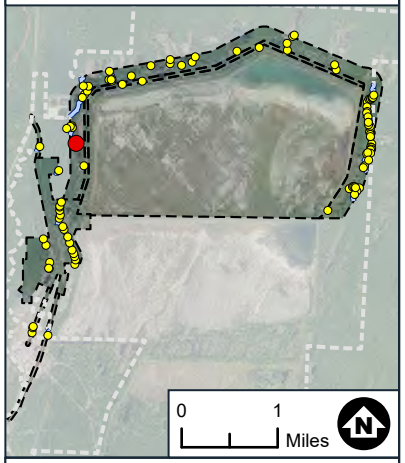


Photo 31 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Mineral River Reach: 7

Photo 32-1



Photo caption: General Site Photo

Photo 32-2



Photo caption: General Site Photo

Photo 32-3



Photo caption: General Site Photo

Photo 32-4



Photo caption: General Site Photo

Photo Locations Overview

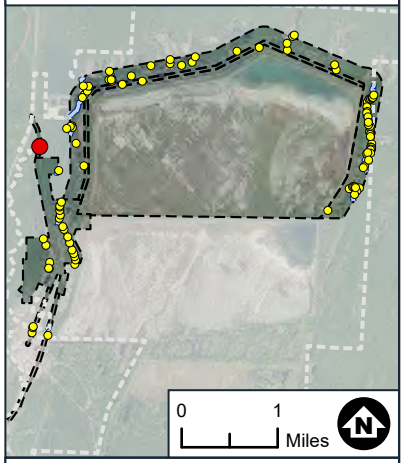


Photo 32 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Mineral River Reach: 9

Photo 33-1



Photo caption: General Site Photo

Photo 33-2



Photo caption: General Site Photo

Photo 33-3



Photo caption: General Site Photo

Photo Locations Overview

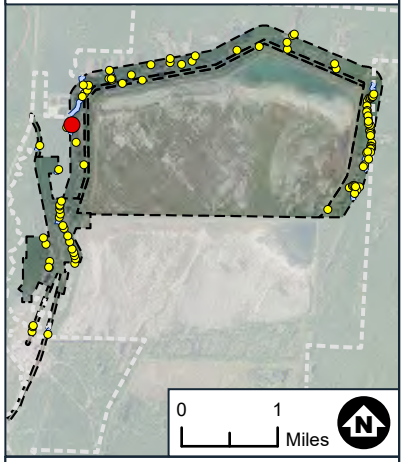
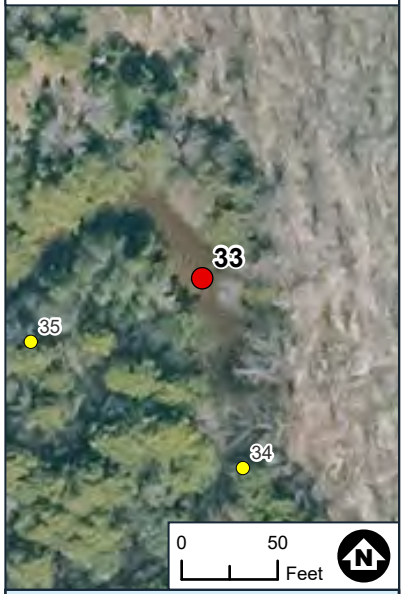


Photo 33 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Mineral River Reach: 9

Photo 34-1



Photo caption: Possible Seep into Mineral River

Photo Locations Overview

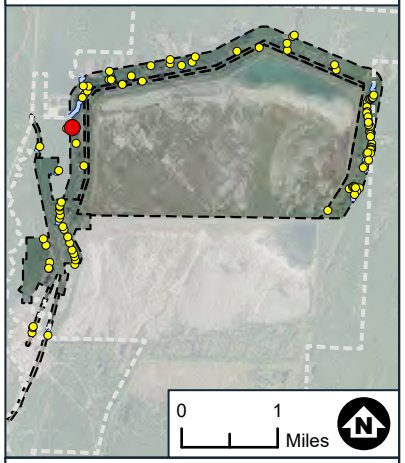


Photo 34 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Mineral River Reach: 9

Photo 35-1



Photo caption: Bedrock Pool

Photo 35-2



Photo caption: Bedrock Pool

Photo 35-3



Photo caption: Bedrock Pool

Photo 35-4



Photo caption: Bedrock Pool

Photo Locations Overview

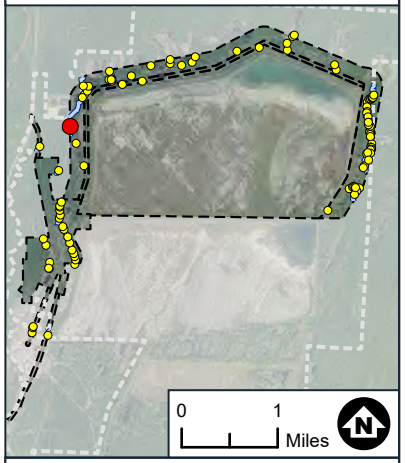


Photo 35 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Mineral River Reach: 9

Photo 36-1



Photo caption: Bedrock Steps

Photo Locations Overview

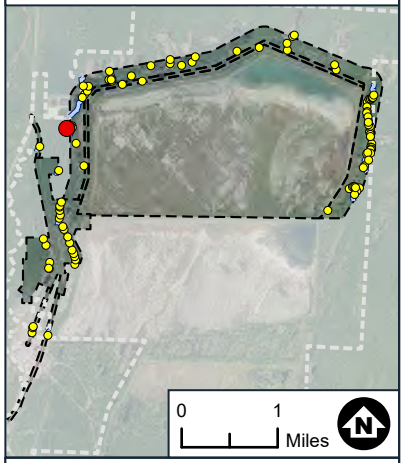


Photo 36 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Mineral River Reach: Reach Break between 9 and 10a

Photo 37-1



Photo caption: General Site Photo

Photo 37-2



Photo caption: General Site Photo

Photo Locations Overview

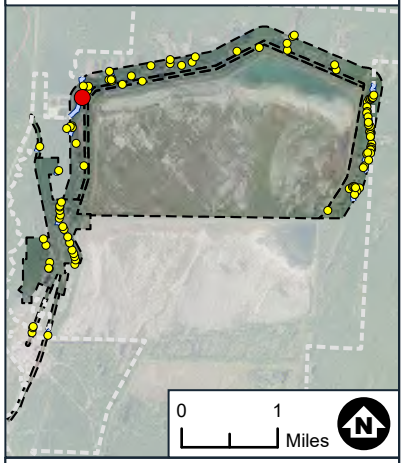


Photo 37 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Mineral River Reach: 10a

Photo 38-1



Photo caption: Looking Upstream

Photo Locations Overview

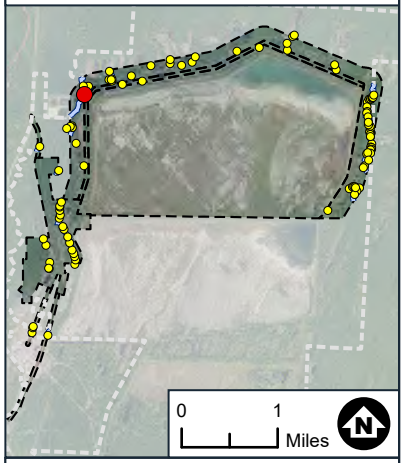


Photo 38 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Mineral River Reach: Reach Break between 10b and 10c

Photo 39-1



Photo caption: Looking Upstream

Photo 39-2



Photo caption: Looking Downstream

Photo 39-3



Photo caption: General Site Photo

Photo Locations Overview

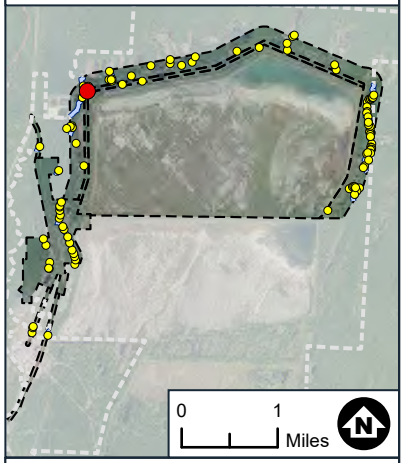


Photo 39 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Mineral River Reach: 10c

Photo 40-1



Photo caption: Looking Upstream at Bedrock Cross Vane

Photo 40-2



Photo caption: Looking Downstream

Photo Locations Overview

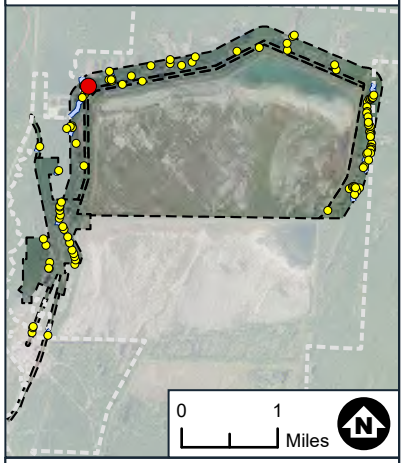


Photo 40 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Mineral River Reach: 10c

Photo 41-1



Photo caption: General Site Photo

Photo Locations Overview

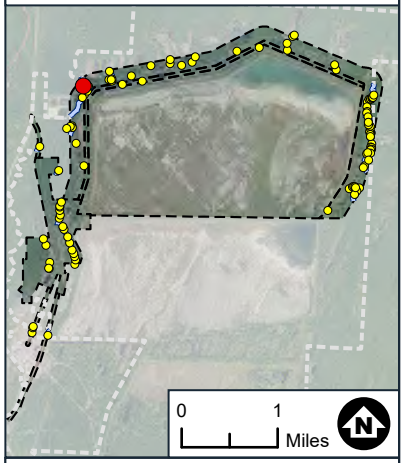


Photo 41 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Perch Creek Reach: 11a

Photo 42-1



Photo caption: Small Tributary into Perch Creek

Photo 42-2



Photo caption: Small Tributary into Perch Creek

Photo Locations Overview

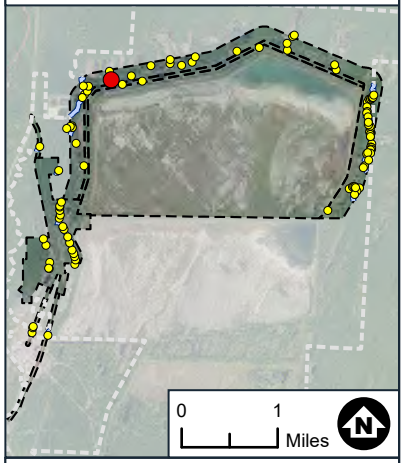
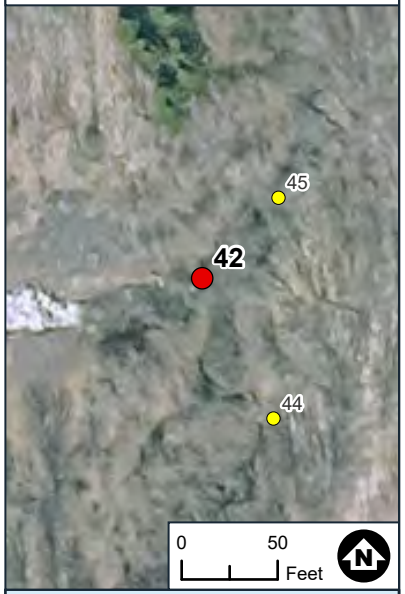


Photo 42 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Perch Creek Reach: 11a

Photo 43-1



Photo caption: Outfall into Perch Creek

Photo 43-2



Photo caption: Outlet Structure to Perch Creek

Photo Locations Overview

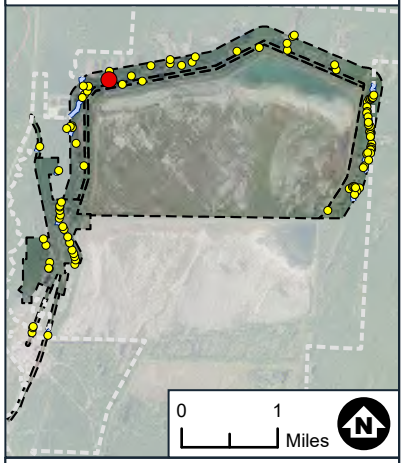


Photo 43 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Perch Creek Reach: 11a

Photo 44-1



Photo caption: Seep or Small Tributary into Perch Creek

Photo Locations Overview

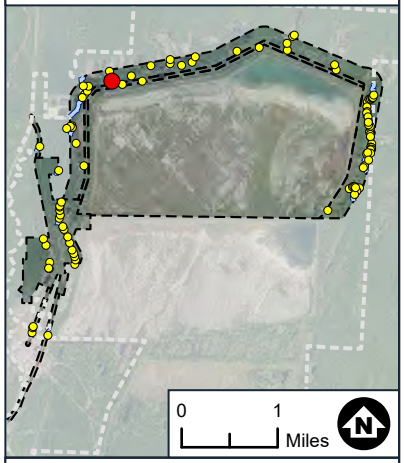


Photo 44 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Perch Creek Reach: 11a

Photo 45-1



Photo caption: General Site Photo

Photo 45-2



Photo caption: General Site Photo

Photo Locations Overview

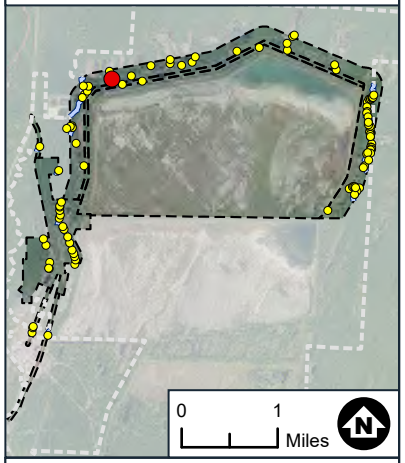
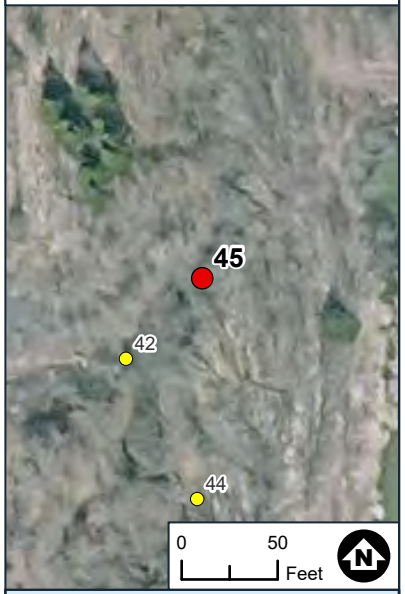


Photo 45 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Perch Creek Reach: 11b

Photo 46-1



Photo caption: Ponded water from Beaver Dam

Photo 46-2



Photo caption: Ponded water from Beaver Dam

Photo 46-3



Photo caption: Ponded water from Beaver Dam

Photo Locations Overview

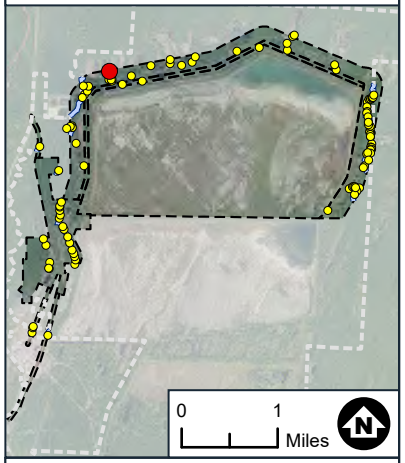
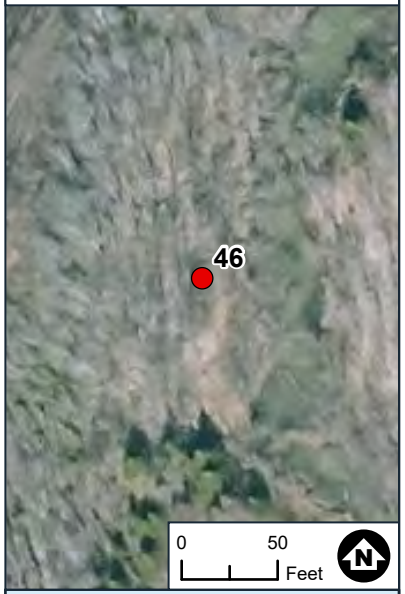


Photo 46 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Unnamed 5 Reach: NA

Photo 47-1



Photo caption: Ponded Water

Photo 47-2



Photo caption: Ponded Water

Photo 47-3



Photo caption: Ponded Water

Photo Locations Overview

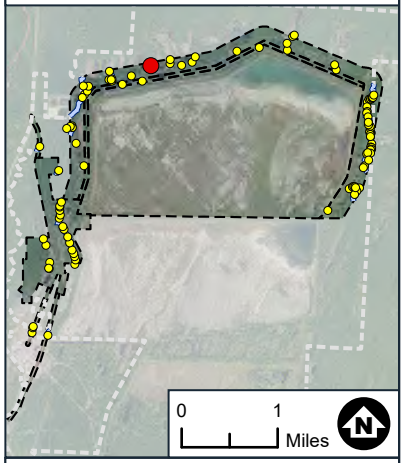


Photo 47 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Native Creek Reach: NA

Photo 48-1



Photo caption: Ponded Water

Photo Locations Overview

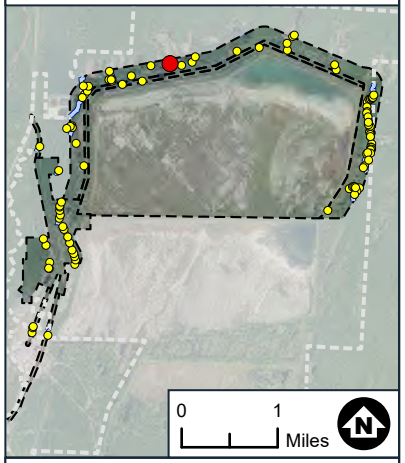


Photo 48 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Native Creek Reach: NA

Photo 49-1



Photo caption: Ponded Water

Photo Locations Overview

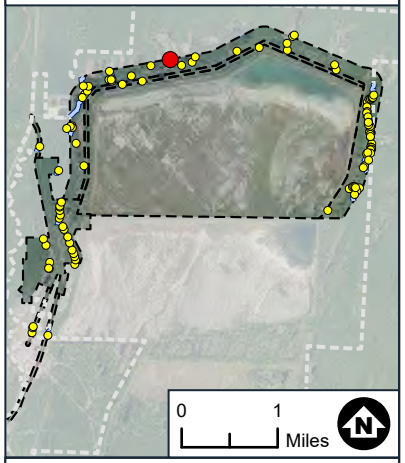


Photo 49 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Unnamed 6 Reach: NA

Photo 50-1



Photo caption: Ponded Water

Photo 50-2



Photo caption: Ponded Water

Photo Locations Overview

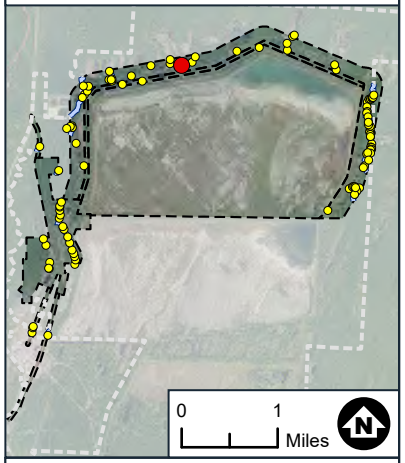
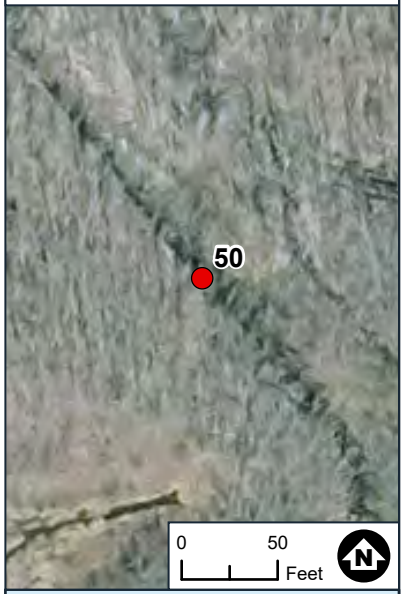


Photo 50 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Unnamed 7 Reach: NA

Photo 51-1



Photo caption: Ponded Water

Photo 51-2



Photo caption: Ponded Water

Photo Locations Overview

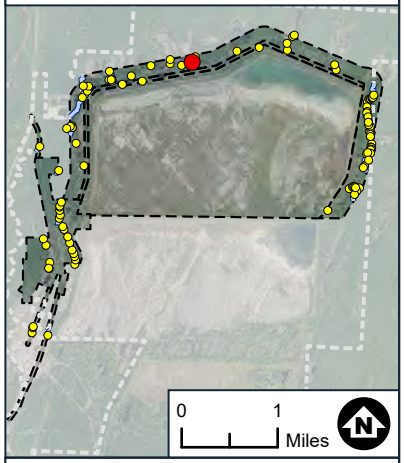


Photo 51 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Patent Creek Reach: NA

Photo 52-1



Photo caption: No Channel Present

Photo 52-2



Photo caption: Ponded Water

Photo 52-3



Photo caption: Ponded Water

Photo Locations Overview

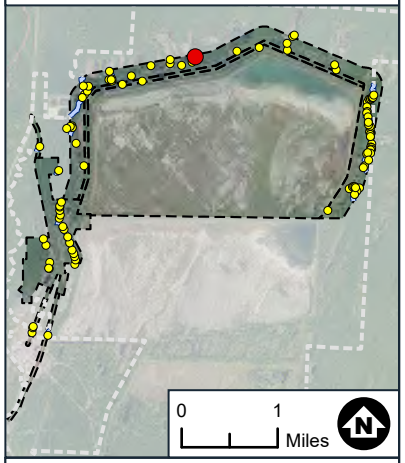
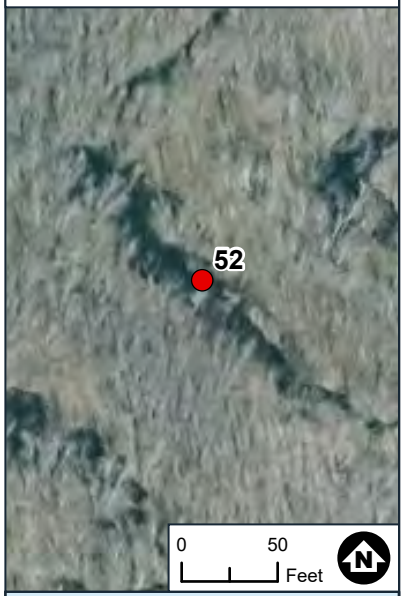


Photo 52 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Unnamed 8 Reach: NA

Photo 53-1



Photo caption: Ponded Water

Photo 53-2



Photo caption: Ponded Water

Photo Locations Overview

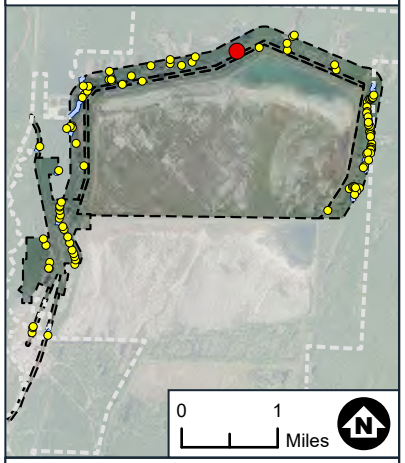


Photo 53 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Miles Creek Reach: NA

Photo 54-1



Photo caption: Ponded Water

Photo 54-2



Photo caption: Ponded Water

Photo Locations Overview

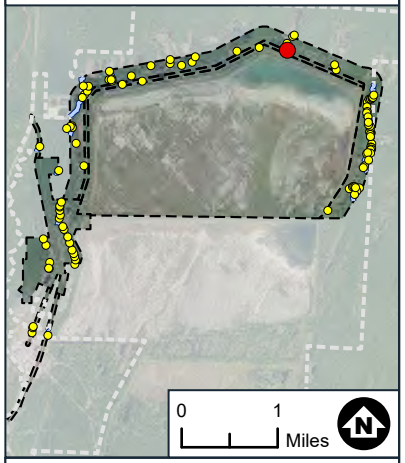


Photo 54 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Miles Creek Reach: NA

Photo 55-1



Photo caption: Ponded Water

Photo Locations Overview

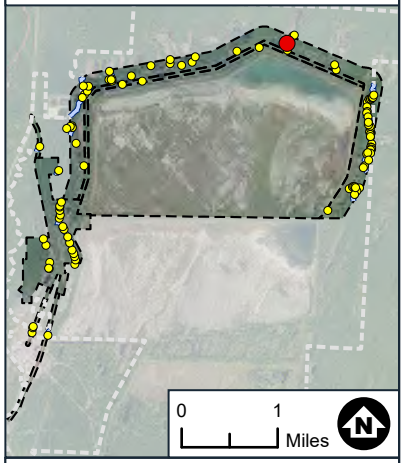


Photo 55 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Miles Creek Reach: NA

Photo 56-1



Photo caption: Ponded Water

Photo 56-2



Photo caption: Ponded Water

Photo Locations Overview

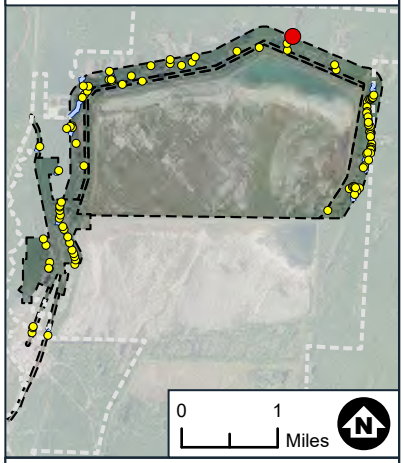


Photo 56 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Miles Creek Reach: NA

Photo 57-1



Photo caption: Ponded Water

Photo Locations Overview

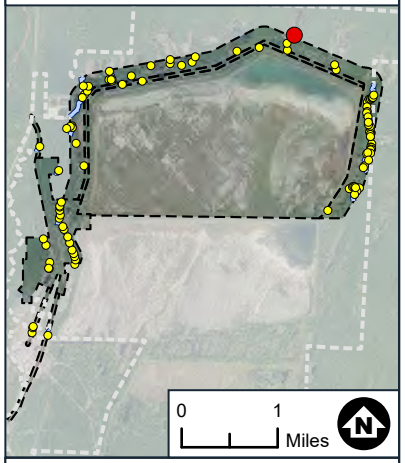
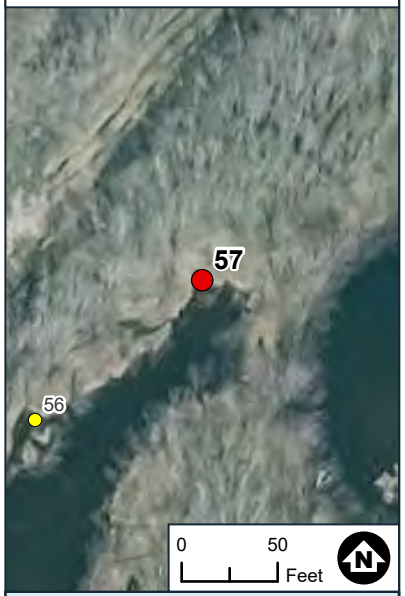


Photo 57 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Stony Creek Reach: NA

Photo 58-1



Photo caption: No Channel Present

Photo Locations Overview

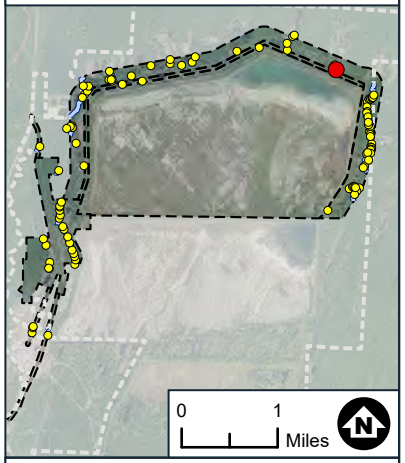


Photo 58 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Stony Creek Reach: NA

Photo 59-1



Photo caption: Ponded Water

Photo Locations Overview

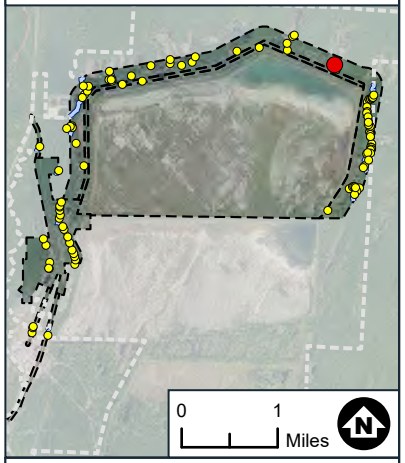


Photo 59 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Pine Creek Reach: 25a

Photo 60-1



Photo caption: Looking Upstream at Main Channel

Photo 60-2



Photo caption: Looking Upstream at Tributary Developed by Beaver Dam Overtopping

Photo 60-3



Photo caption: Looking Upstream at Tributary

Photo 60-4



Photo caption: Looking Upstream at Tributary

Photo Locations Overview

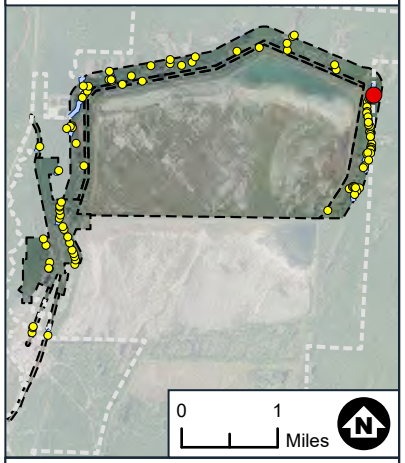
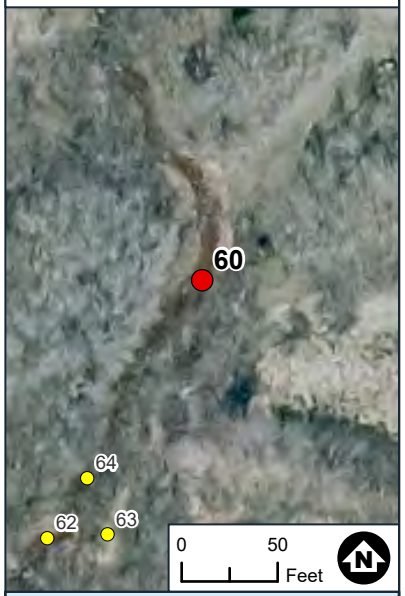


Photo 60 Location



Stream Survey Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Pine Creek Reach: Reach Break Between 25a and 25b

Photo 61-1



Photo caption: Looking Upstream at Beaver Dam

Photo Locations Overview

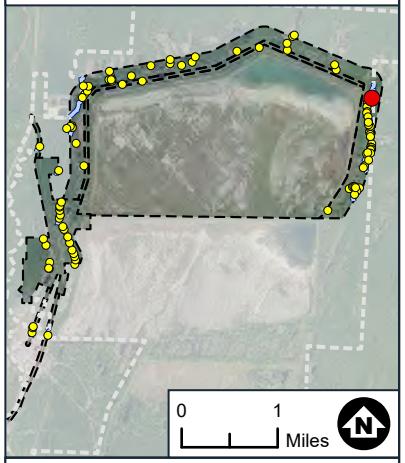
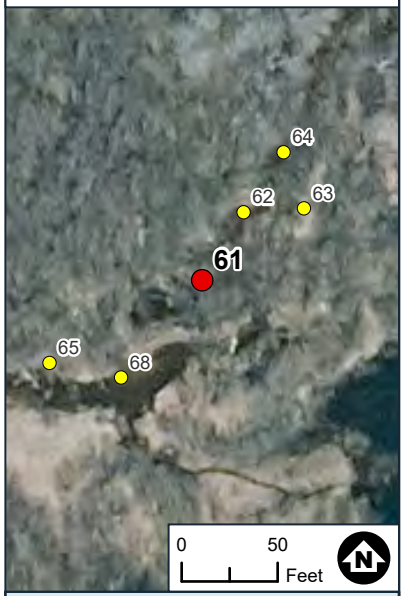


Photo 61 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Pine Creek Reach: Reach Break Between 25a and 25b

Photo 62-1



Photo caption: Looking Upstream at Beaver Dam

Photo Locations Overview

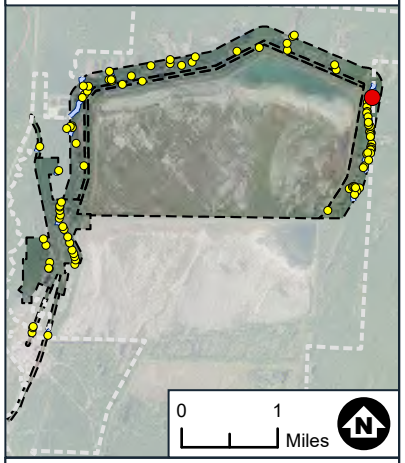
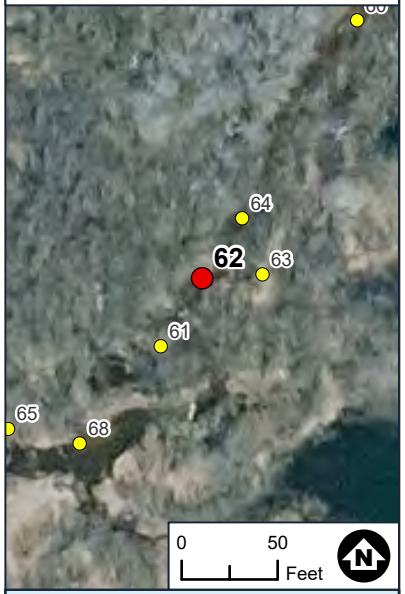


Photo 62 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Pine Creek Reach: Reach Break Between 25a and 25b

Photo 63-1



Photo caption: Activated Channel During High Flow

Photo Locations Overview

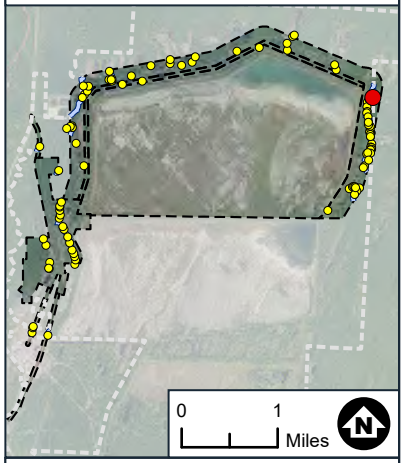
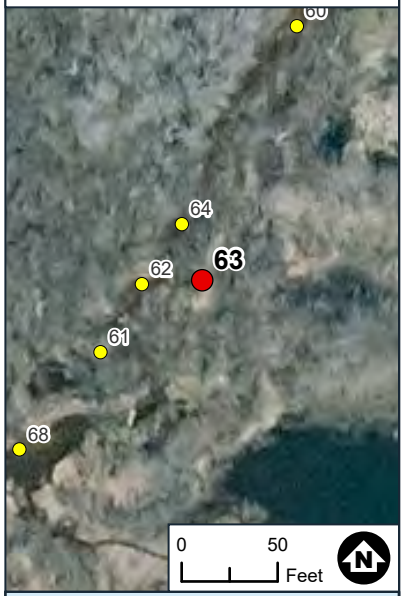


Photo 63 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Pine Creek Reach: Reach Break Between 25a and 25b

Photo 64-1



Photo caption: Looking Upstream at Beaver Dam

Photo 64-2



Photo caption: General Site Photo

Photo Locations Overview

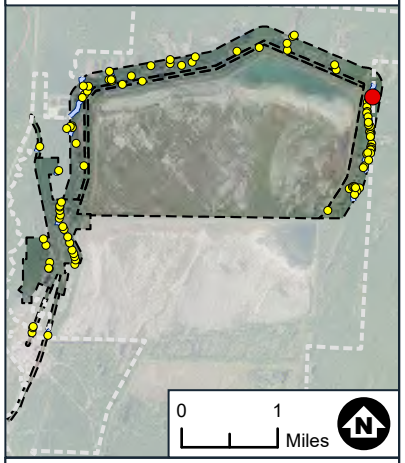
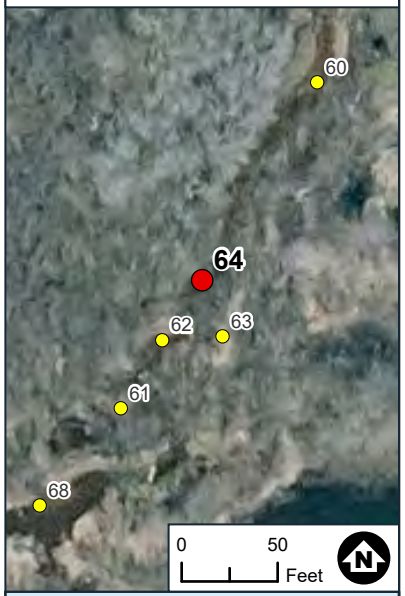


Photo 64 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Pine Creek Reach: 25b

Photo 65-1



Photo caption: General Site Photo

Photo 65-2



Photo caption: General Site Photo

Photo 65-3



Photo caption: General Site Photo

Photo Locations Overview

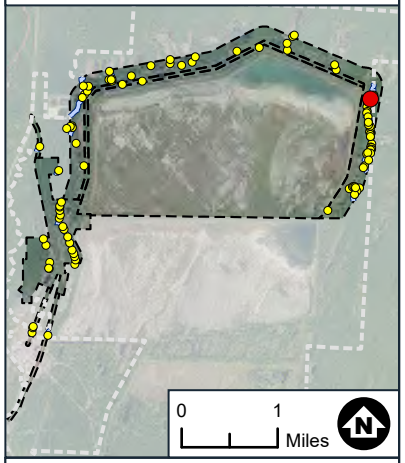
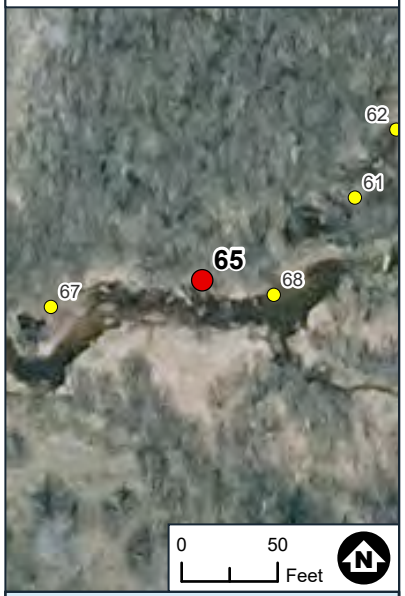


Photo 65 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Pine Creek Reach: 25b

Photo 66-1



Photo caption: General Site Photo

Photo Locations Overview

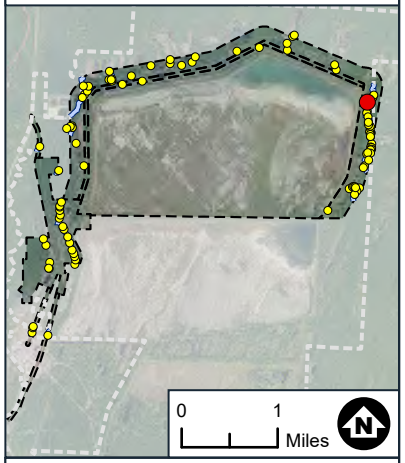


Photo 66 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Pine Creek Reach: 25b

Photo 67-1



Photo caption: General Site Photo

Photo 67-2



Photo caption: General Site Photo

Photo Locations Overview

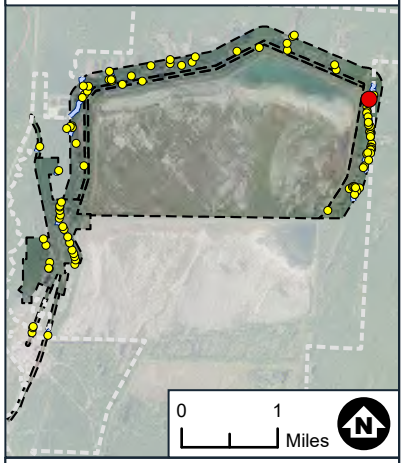


Photo 67 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Pine Creek Reach: 25b

Photo 68-1



Photo caption: Former Beaver Dam

Photo Locations Overview

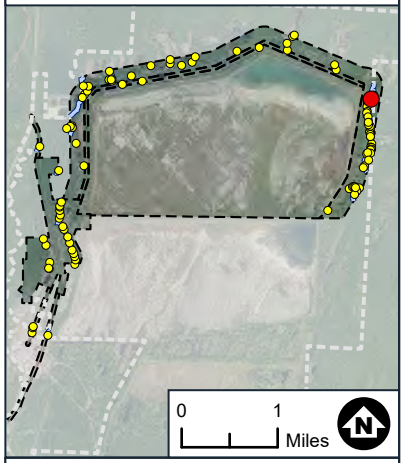
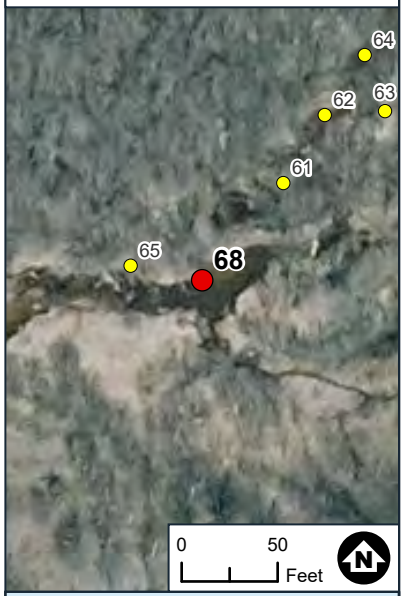


Photo 68 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Pine Creek Reach: 25b

Photo 69-1



Photo caption: General Site Photo

Photo Locations Overview

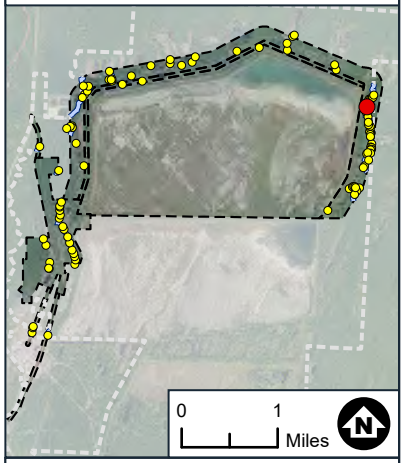


Photo 69 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Pine Creek Reach: 25c

Photo 70-1



Photo caption: Looking Upstream

Photo 70-2



Photo caption: Looking Downstream

Photo Locations Overview

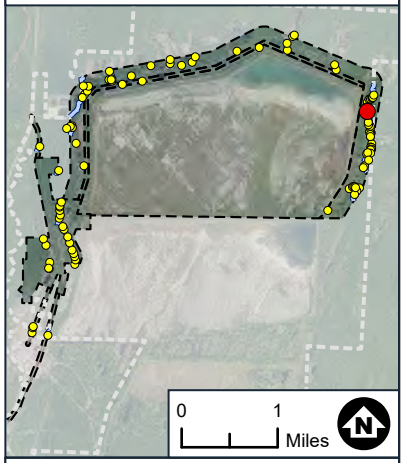
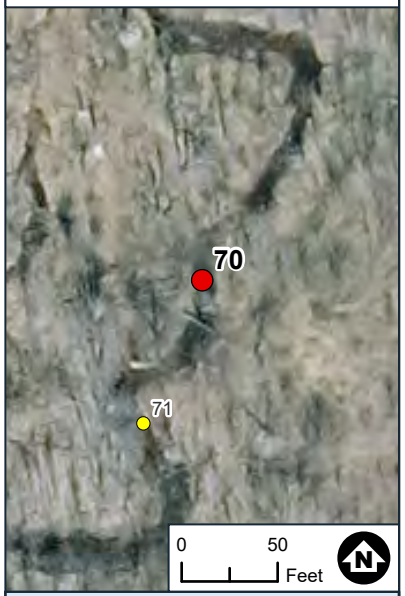


Photo 70 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Pine Creek Reach: 25d

Photo 71-1



Photo caption: General Site Photo

Photo Locations Overview

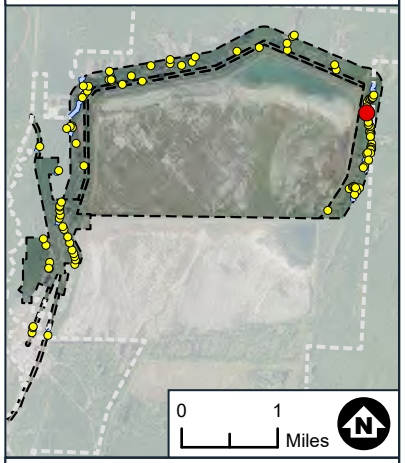
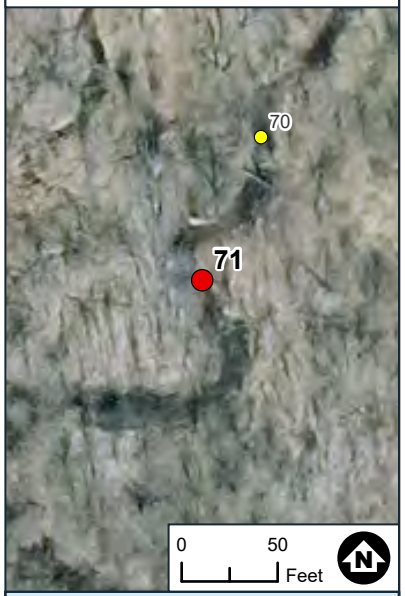


Photo 71 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Pine Creek Reach: 25e

Photo 72-1



Photo caption: General Site Photo

Photo 72-2



Photo caption: General Site Photo

Photo Locations Overview

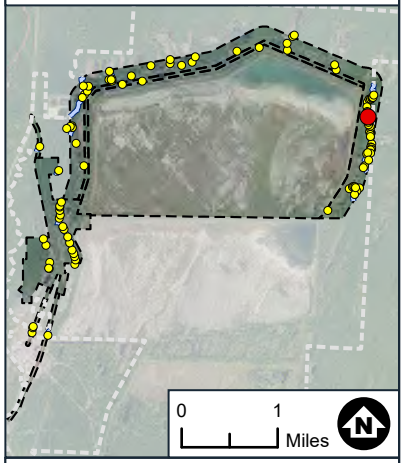


Photo 72 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Pine Creek Reach: 25e

Photo 73-1



Photo caption: Beaver Dam

Photo 73-2



Photo caption: Ponded Water

Photo Locations Overview

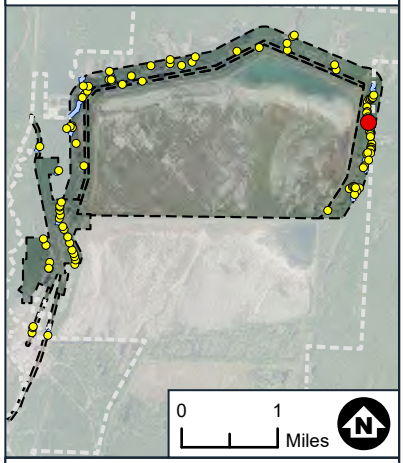


Photo 73 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Pine Creek Reach: 25e

Photo 74-1



Photo caption: Looking Downstream

Photo 74-2



Photo caption: General Site Photo

Photo Locations Overview

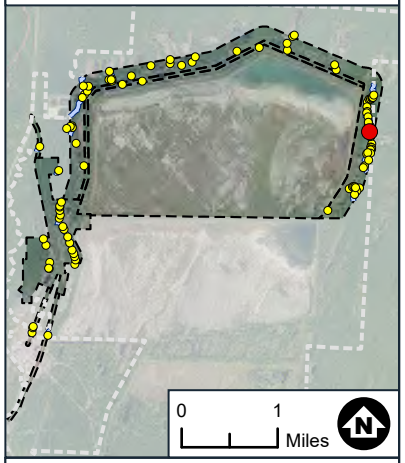
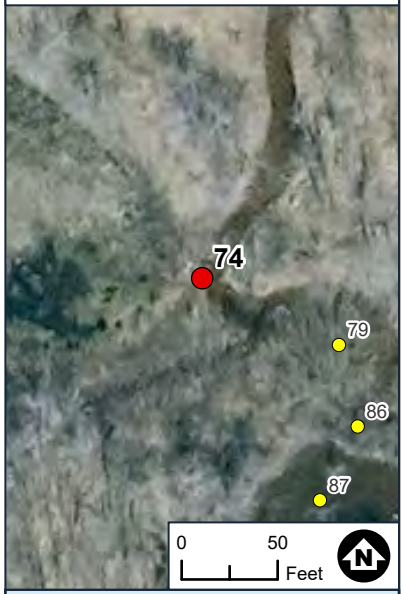


Photo 74 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Pine Creek Reach: 25e

Photo 75-1



Photo caption: General Site Photo

Photo 75-2



Photo caption: General Site Photo

Photo 75-3



Photo caption: General Site Photo

Photo 75-4



Photo caption: General Site Photo

Photo Locations Overview

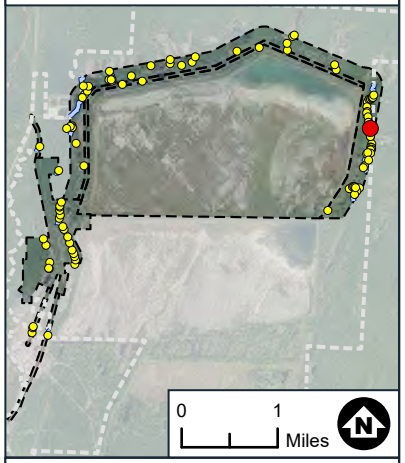
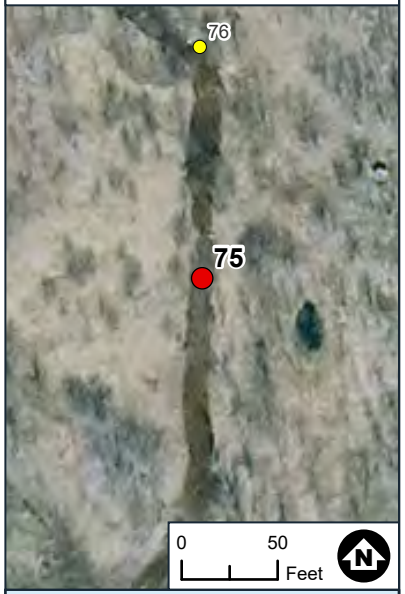


Photo 75 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Pine Creek Reach: 25e

Photo 76-1



Photo caption: General Site Photo

Photo Locations Overview

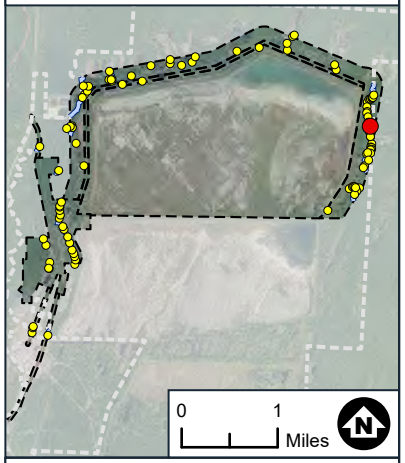
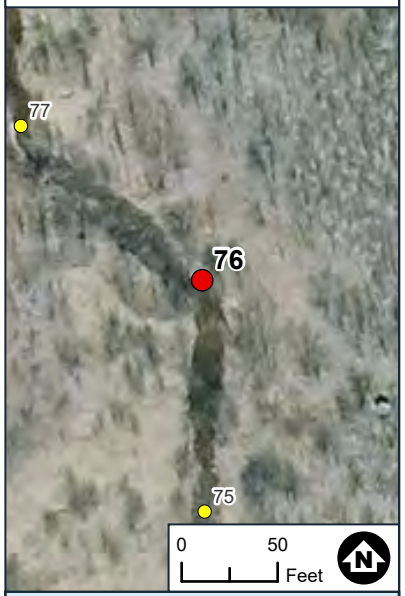


Photo 76 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Pine Creek Reach: 25e

Photo 77-1



Photo caption: General Site Photo

Photo 77-2



Photo caption: General Site Photo

Photo 77-3



Photo caption: General Site Photo

Photo Locations Overview

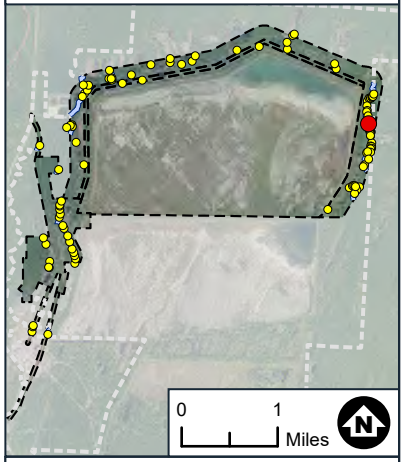
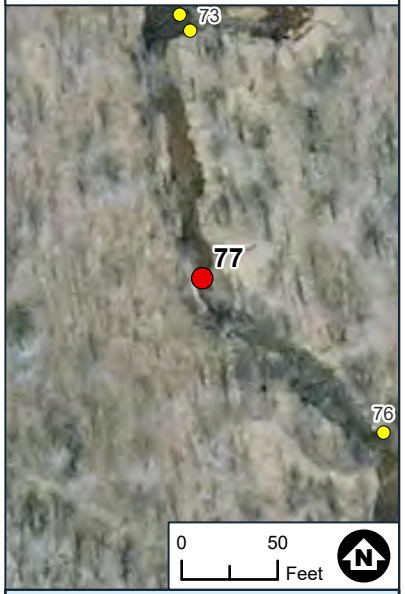


Photo 77 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Pine Creek Reach: 25e

Photo 78-1



Photo caption: Remant Beaver Dam and Pool

Photo 78-2



Photo caption: Remant Beaver Dam and Pool

Photo 78-3



Photo caption: Remant Beaver Dam and Pool

Photo 78-4



Photo caption: Remant Beaver Dam and Pool

Photo Locations Overview

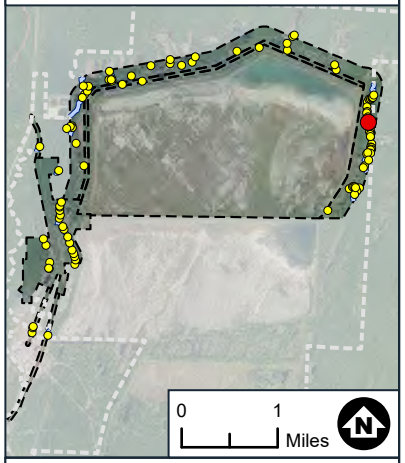
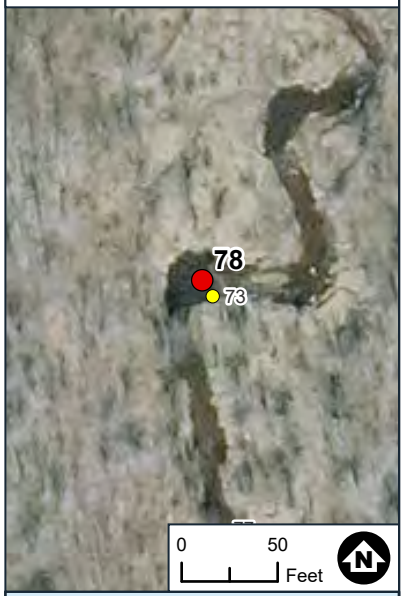


Photo 78 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Pine Creek Reach: Reach Break Between 25g and 25e

Photo 79-1



Photo caption: Small Tributary

Photo Locations Overview

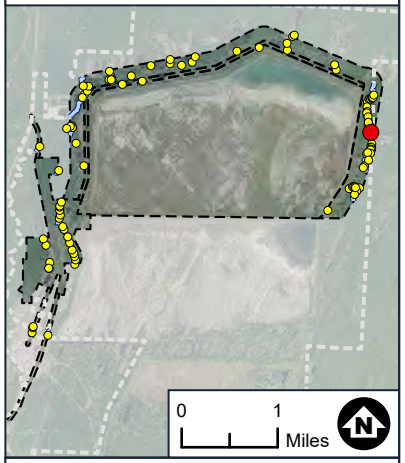
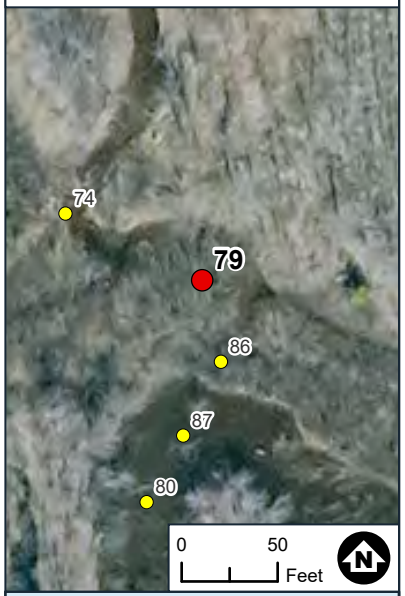


Photo 79 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Pine Creek Reach: 25g

Photo 80-1



Photo caption: Looking Upstream at Beaver Dam

Photo Locations Overview

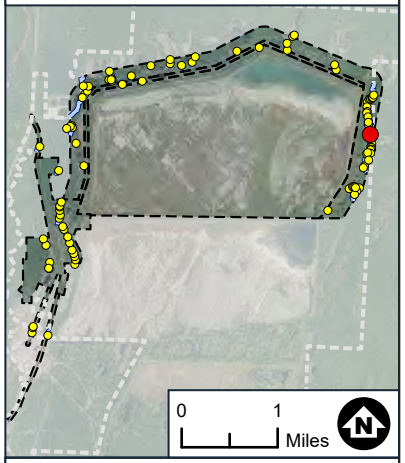
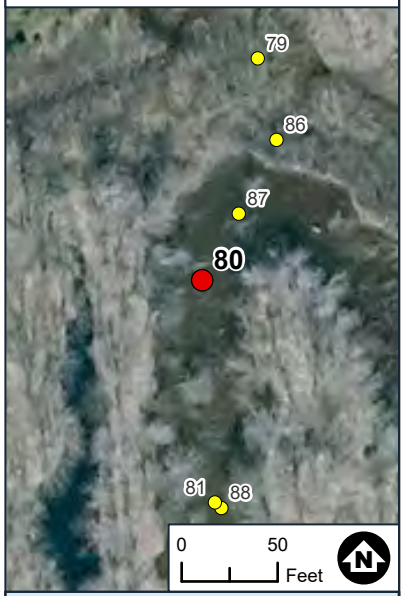


Photo 80 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Pine Creek Reach: 25g

Photo 81-1



Photo caption: Looking Upstream

Photo 81-2



Photo caption: Looking Downstream

Photo Locations Overview

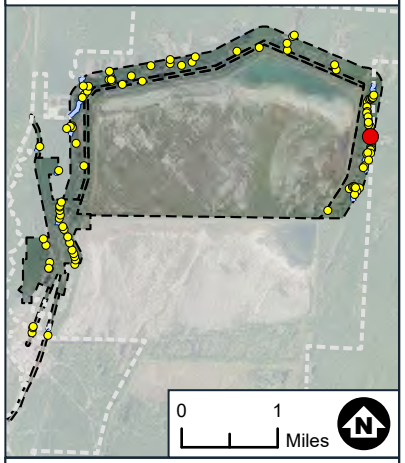


Photo 81 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Pine Creek Reach: 25g

Photo 82-1



Photo caption: Looking Upstream

Photo Locations Overview

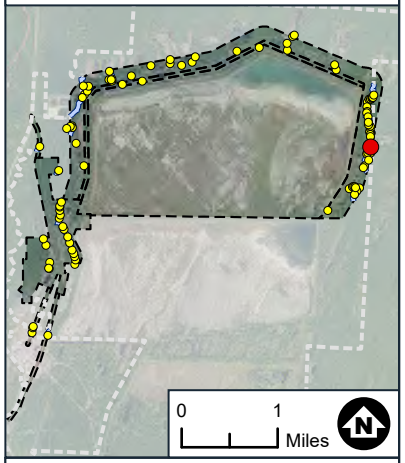
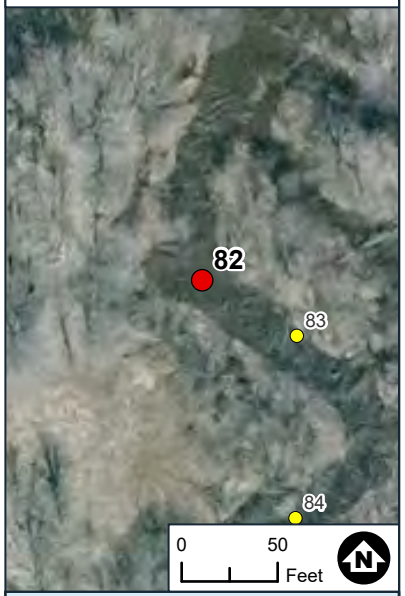


Photo 82 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Pine Creek Reach: 25g

Photo 83-1



Photo caption: General Site Photo

Photo Locations Overview

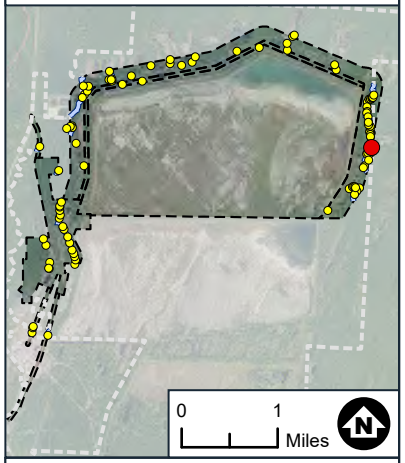
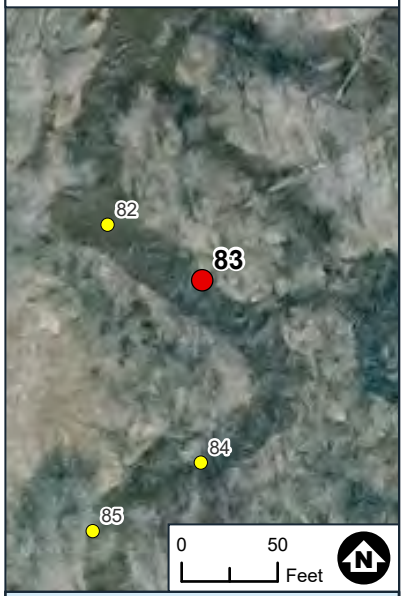


Photo 83 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Pine Creek Reach: 25g

Photo 84-1



Photo caption: General Site Photo

Photo 84-2



Photo caption: General Site Photo

Photo 84-3



Photo caption: General Site Photo

Photo Locations Overview

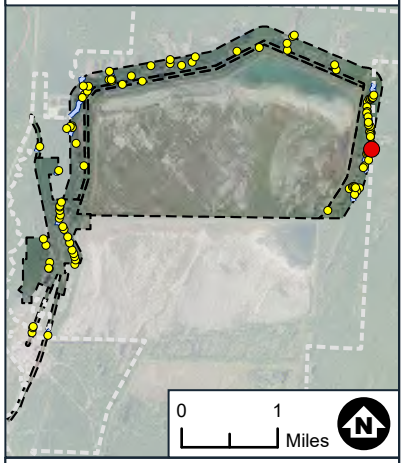
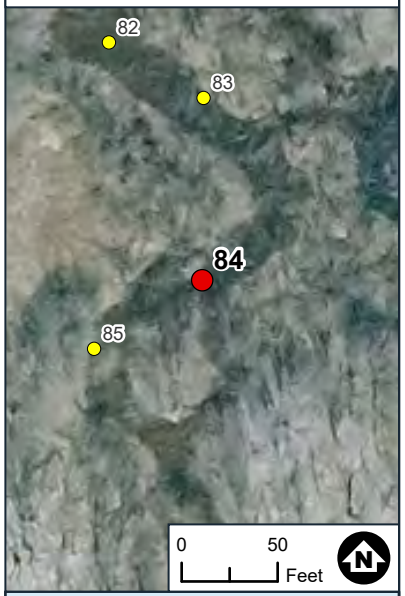


Photo 84 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Pine Creek Reach: 25g

Photo 85-1



Photo caption: General Site Photo

Photo 85-2



Photo caption: General Site Photo

Photo Locations Overview

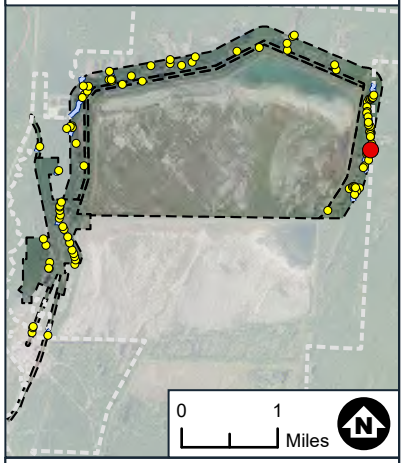
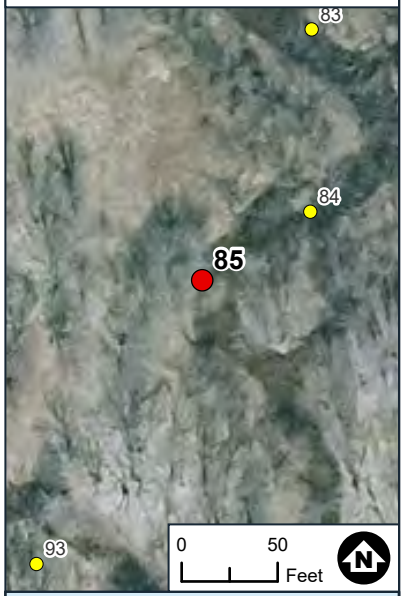


Photo 85 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Pine Creek Reach: 25g

Photo 86-1



Photo caption: Former Beaver Dam

Photo 86-2



Photo caption: Looking Downstream

Photo Locations Overview

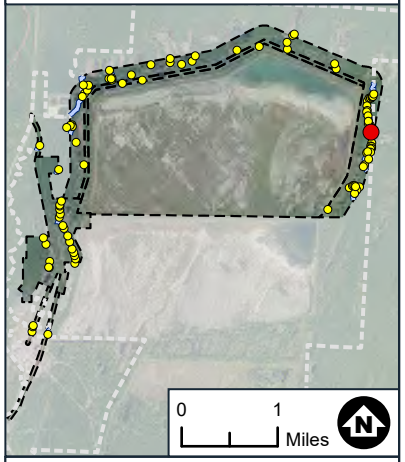
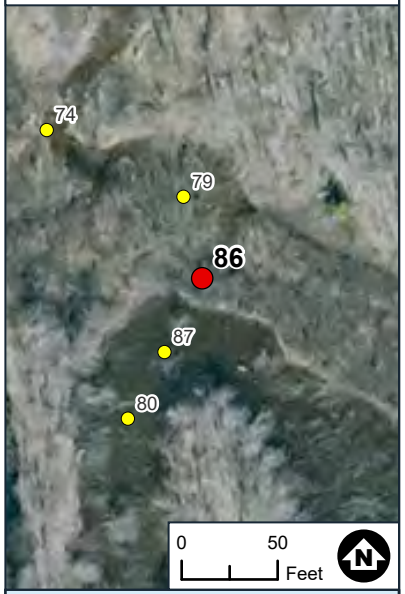


Photo 86 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Pine Creek Reach: 25g

Photo 87-1



Photo caption: Small Tributary

Photo Locations Overview

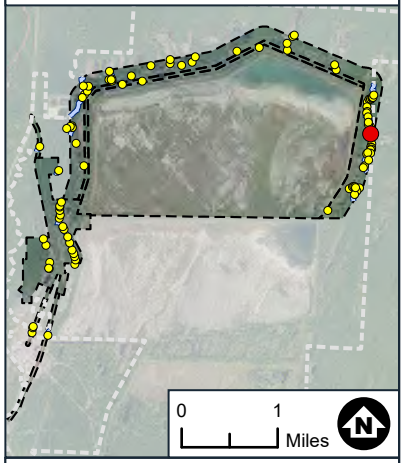
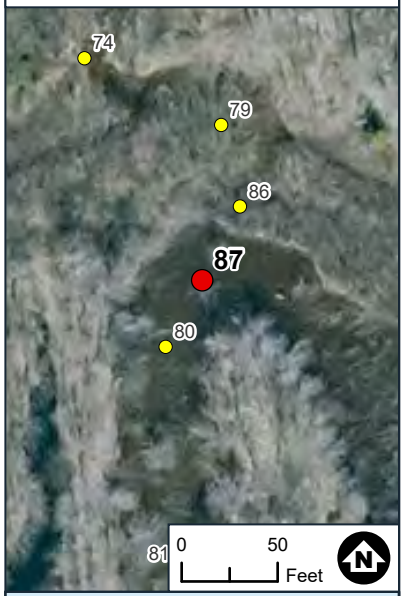


Photo 87 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Pine Creek Reach: 25g

Photo 88-1



Photo caption: General Site Photo

Photo 88-2



Photo caption: General Site Photo

Photo Locations Overview

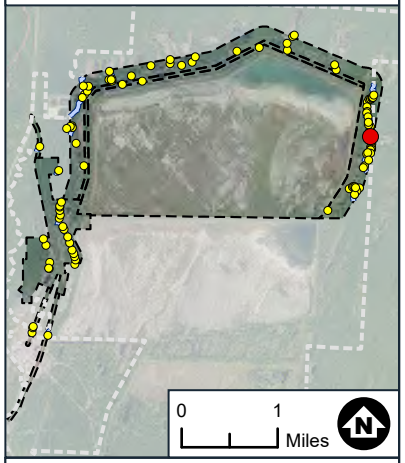
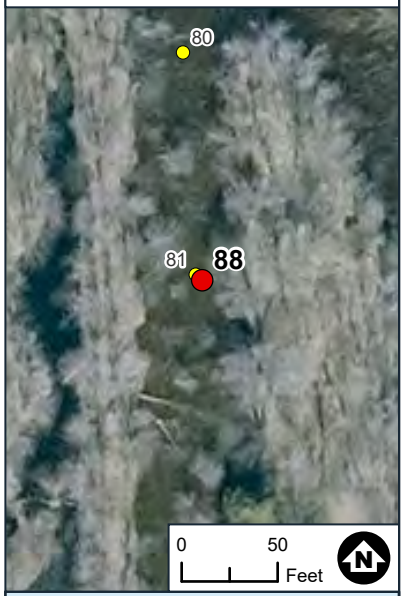


Photo 88 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Pine Creek Reach: 25g

Photo 89-1



Photo caption: Debris Dam

Photo 89-2



Photo caption: Debris Dam

Photo Locations Overview

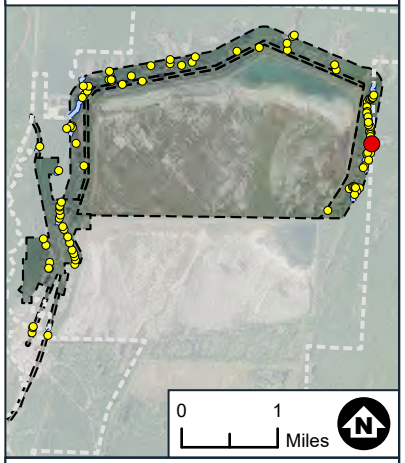


Photo 89 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Pine Creek Reach: 25h

Photo 90-1



Photo caption: General Site Photo

Photo 90-2



Photo caption: General Site Photo

Photo Locations Overview

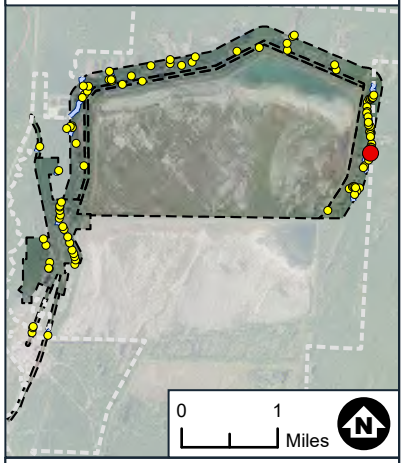
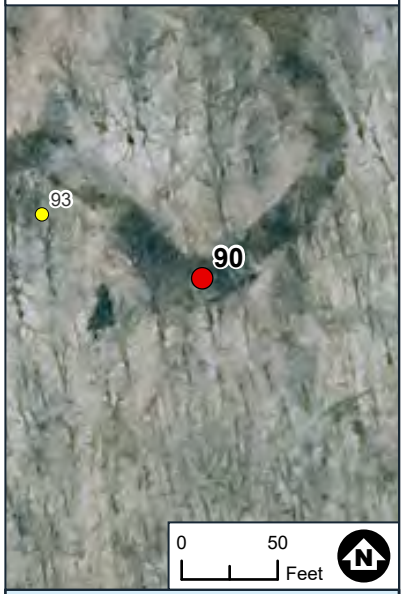


Photo 90 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Pine Creek Reach: 25h

Photo 91-1



Photo caption: General Site Photo

Photo 91-2



Photo caption: General Site Photo

Photo Locations Overview

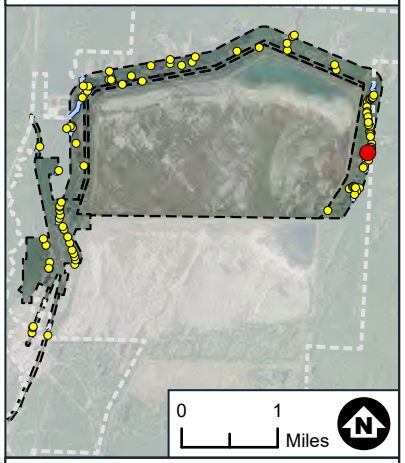
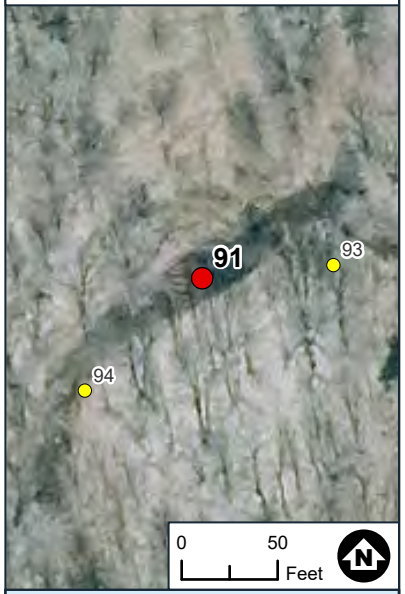


Photo 91 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Pine Creek Reach: 25h

Photo 92-1



Photo caption: General Site Photo

Photo 92-2



Photo caption: General Site Photo

Photo Locations Overview

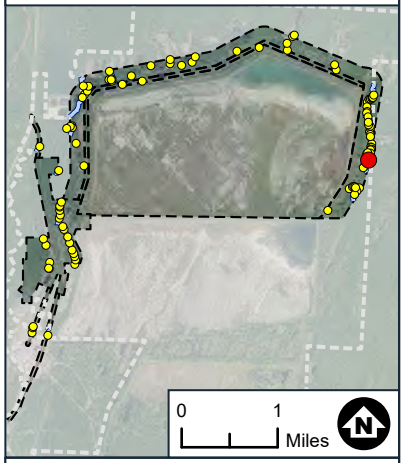
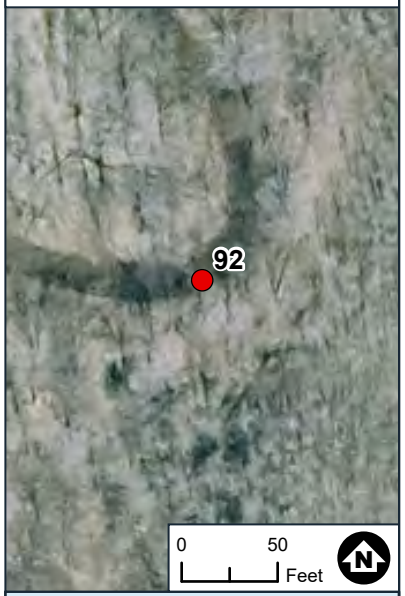


Photo 92 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Pine Creek Reach: 25h

Photo 93-1



Photo caption: General Site Photo

Photo 93-2



Photo caption: General Site Photo

Photo Locations Overview

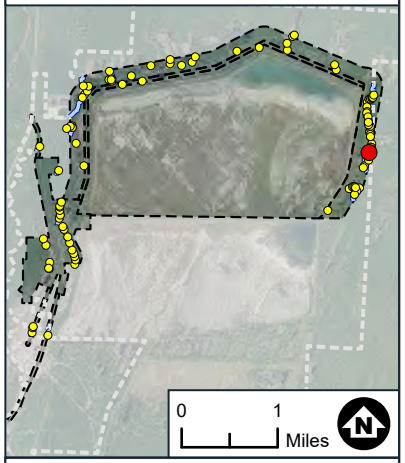
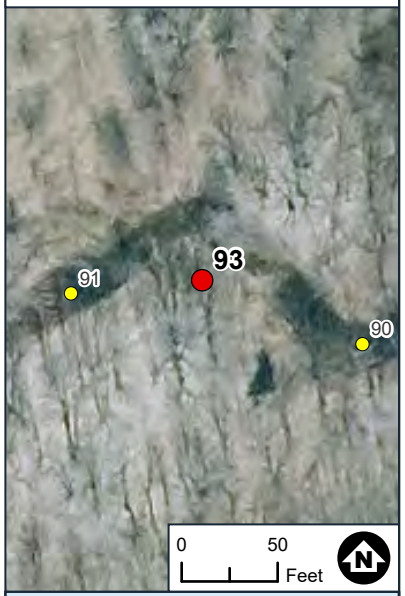


Photo 93 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Pine Creek Reach: 25h

Photo 94-1



Photo caption: General Site Photo

Photo 94-2



Photo caption: General Site Photo

Photo Locations Overview

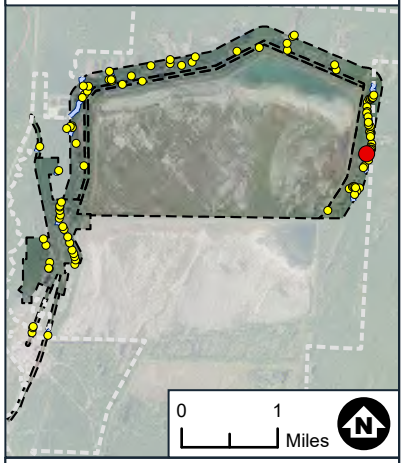
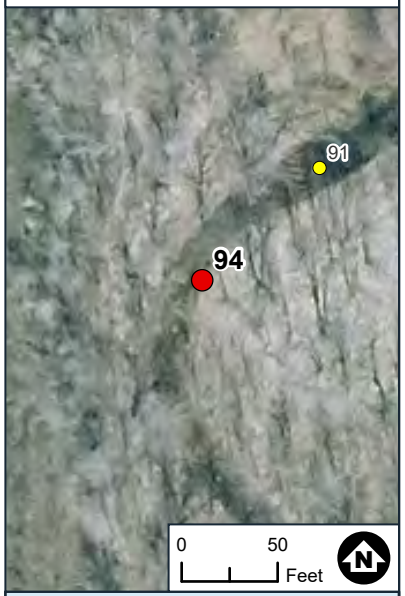


Photo 94 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Pine Creek Reach: 25h

Photo 95-1



Photo caption: General Site Photo

Photo 95-2



Photo caption: Debris Dam

Photo Locations Overview

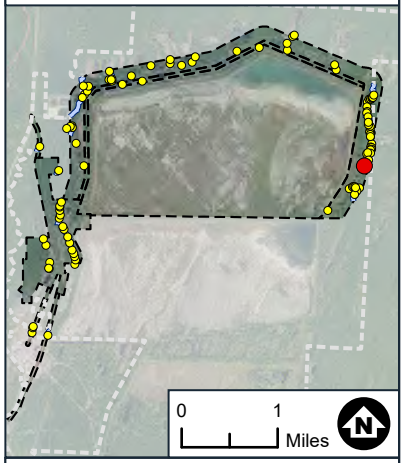
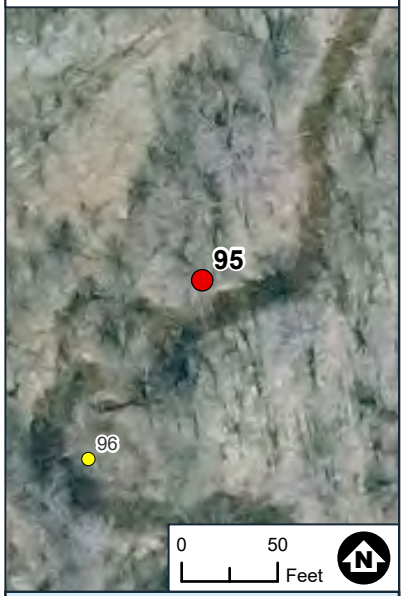


Photo 95 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Pine Creek Reach: 25h

Photo 96-1



Photo caption: Small Tributary

Photo Locations Overview

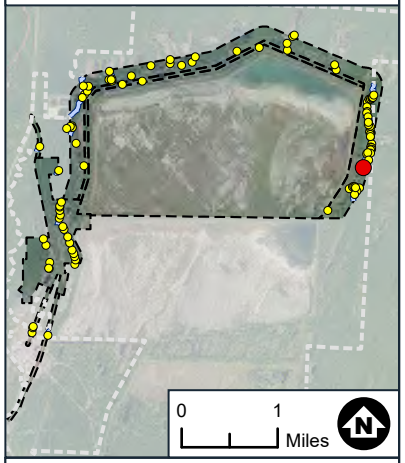
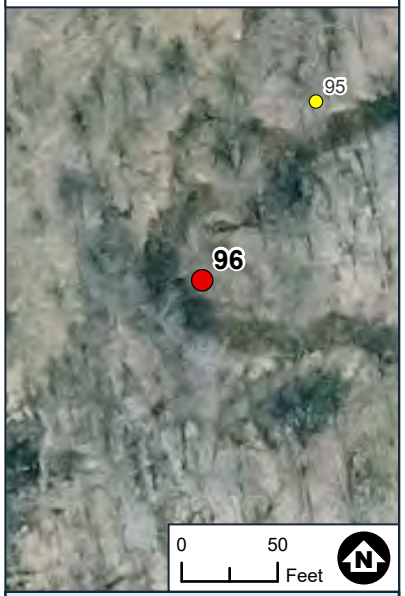


Photo 96 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Pine Creek Reach: 25i

Photo 97-1



Photo caption: General Site Photo

Photo 97-2



Photo caption: General Site Photo

Photo Locations Overview

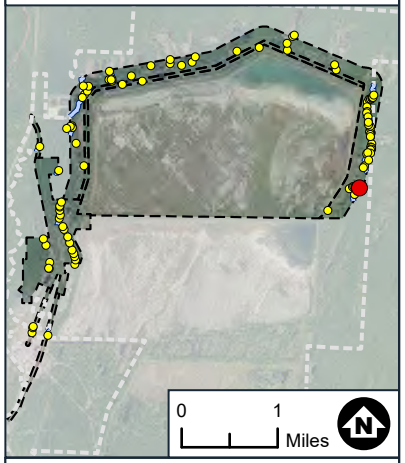


Photo 97 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Pine Creek Reach: 25i

Photo 98-1



Photo caption: General Site Photo

Photo 98-2



Photo caption: General Site Photo

Photo Locations Overview

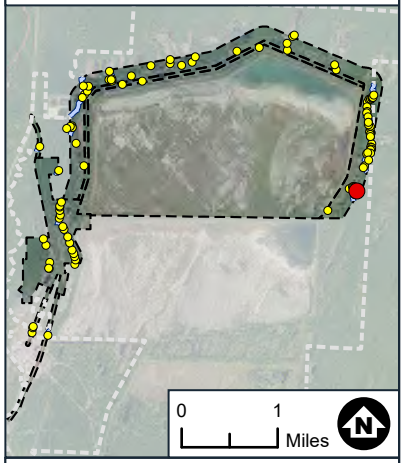


Photo 98 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Pine Creek Reach: 25i

Photo 99-1



Photo caption: Debris Dam

Photo 99-2



Photo caption: Debris Dam

Photo Locations Overview

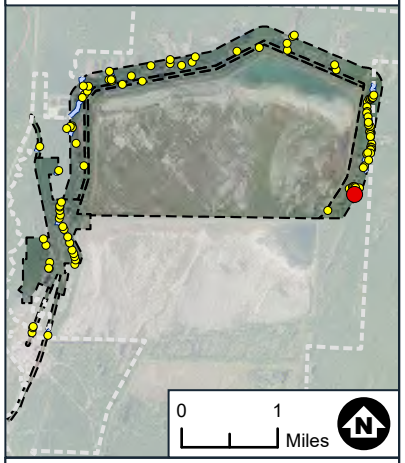


Photo 99 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Caribou Creek Reach: 26

Photo 100-1



Photo caption: Ponded Water

Photo Locations Overview

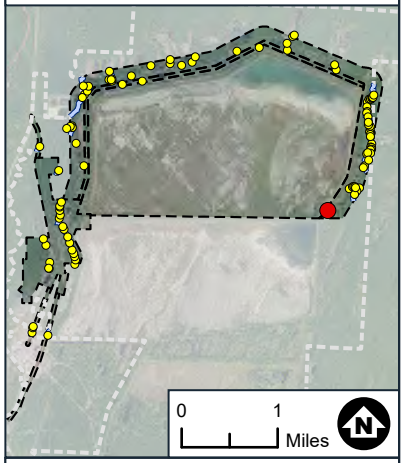


Photo 100 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Caribou Creek Reach: 26

Photo 101-1



Photo caption: Caribou Confluence

Photo 101-2



Photo caption: Caribou Confluence

Photo Locations Overview

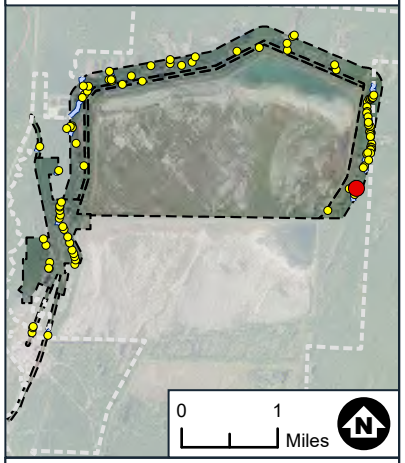
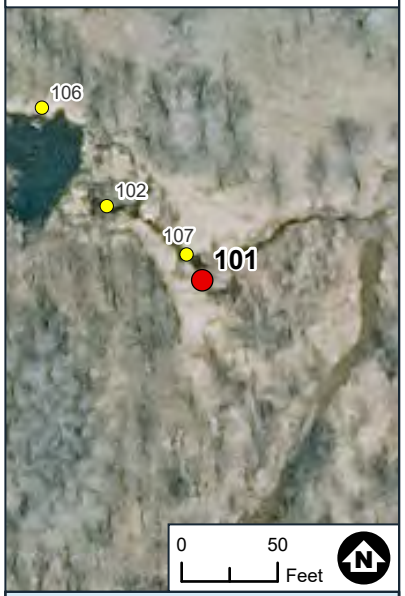


Photo 101 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Caribou Creek Reach: 26

Photo 102-1



Photo caption: Riffle

Photo Locations Overview

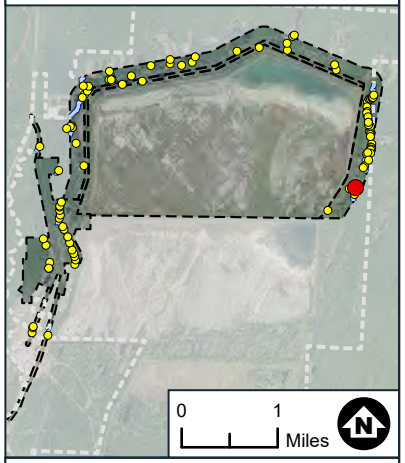
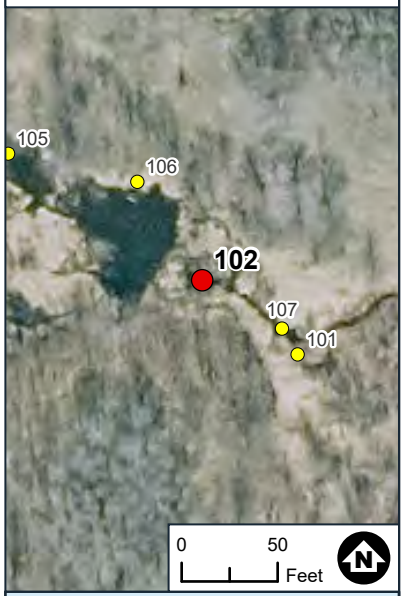


Photo 102 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Caribou Creek Reach: 26

Photo 103-1



Photo caption: Pond

Photo 103-2



Photo caption: Carbiou Creek Looking Upstream at Dam

Photo 103-3



Photo caption: Carbiou Creek Looking Upstream at Dam

Photo Locations Overview

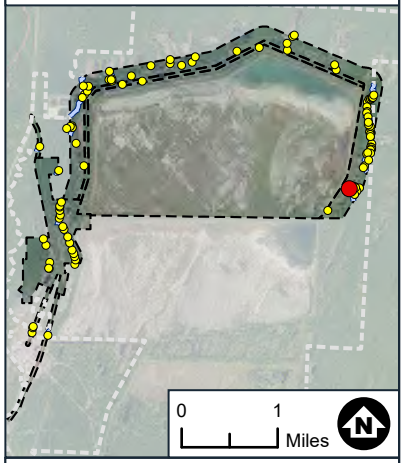


Photo 103 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Caribou Creek Reach: 26

Photo 104-1



Photo caption: Pond

Photo 104-2



Photo caption: Pond

Photo Locations Overview

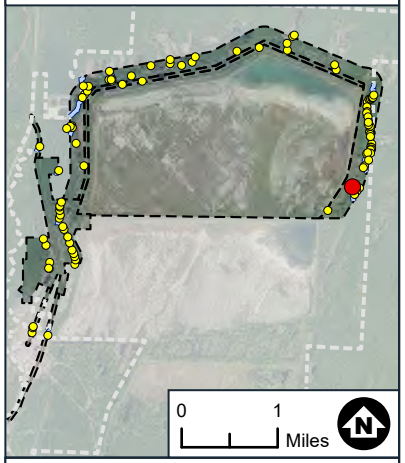
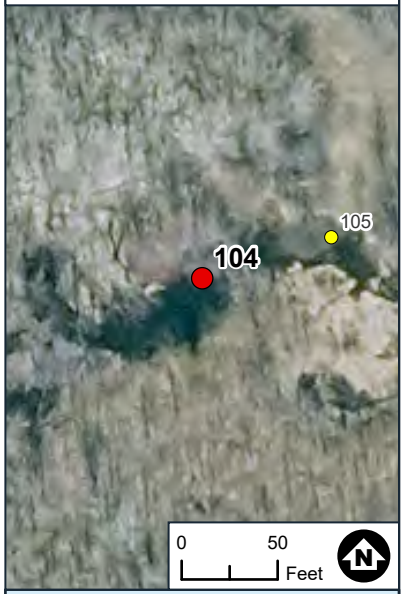


Photo 104 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Caribou Creek Reach: 26

Photo 105-1



Photo caption: General Site Photo

Photo Locations Overview

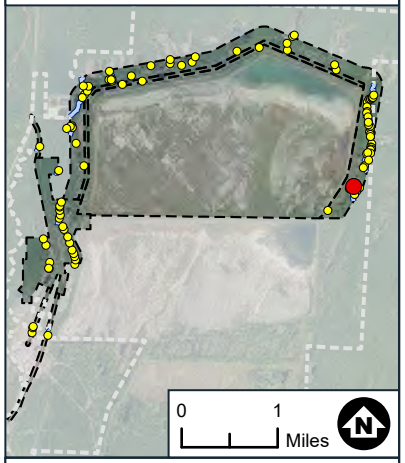
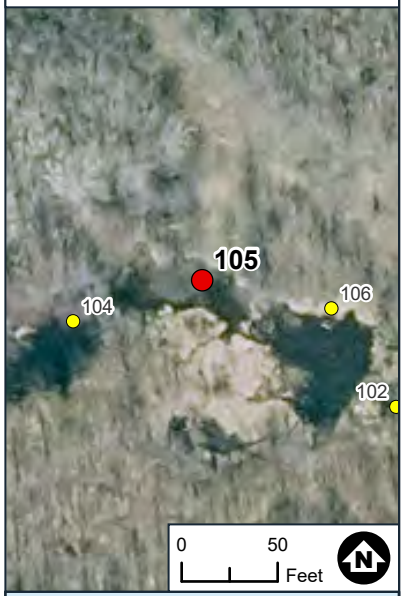


Photo 105 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Caribou Creek Reach: 26

Photo 106-1



Photo caption: General Site Photo

Photo Locations Overview

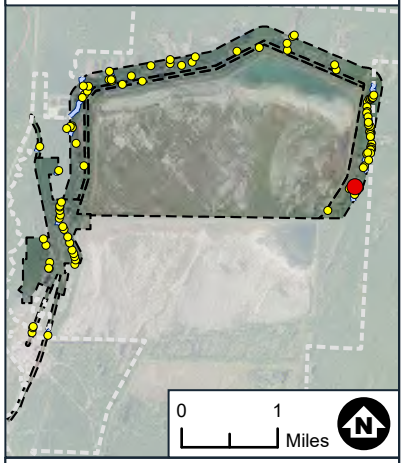
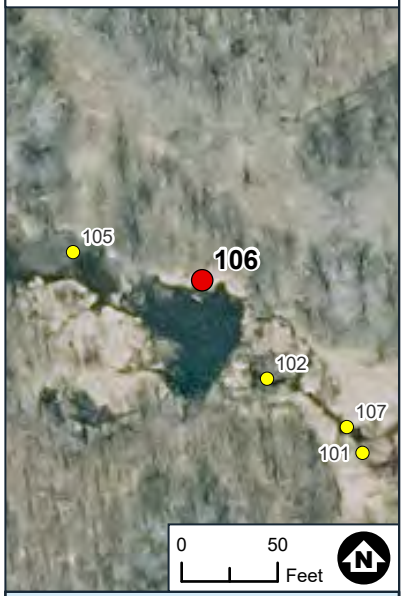


Photo 106 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Caribou Creek Reach: 26

Photo 107-1



Photo caption: General Site Photo

Photo 107-2



Photo caption: Approximate Temp/DO Logger Location

Photo Locations Overview

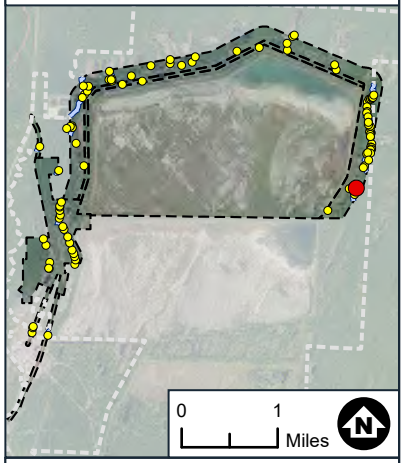
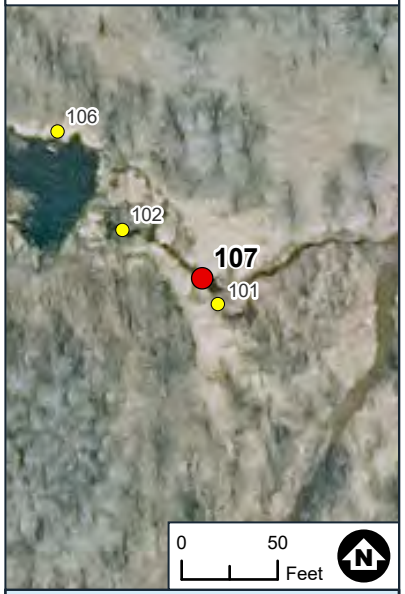


Photo 107 Location



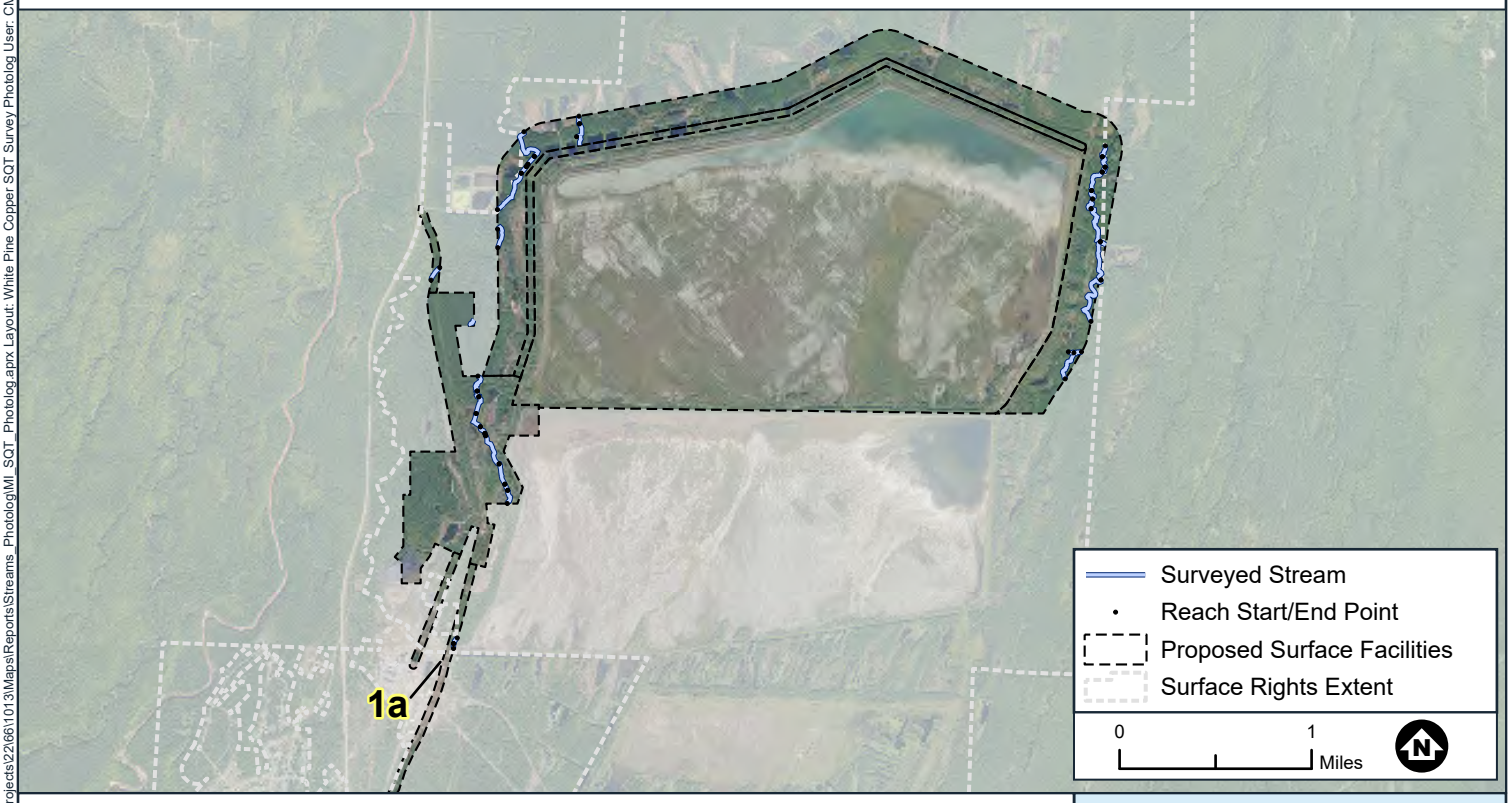
Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Appendix B

Stream Geomorphic Assessment Photo Log





Reach: 1a

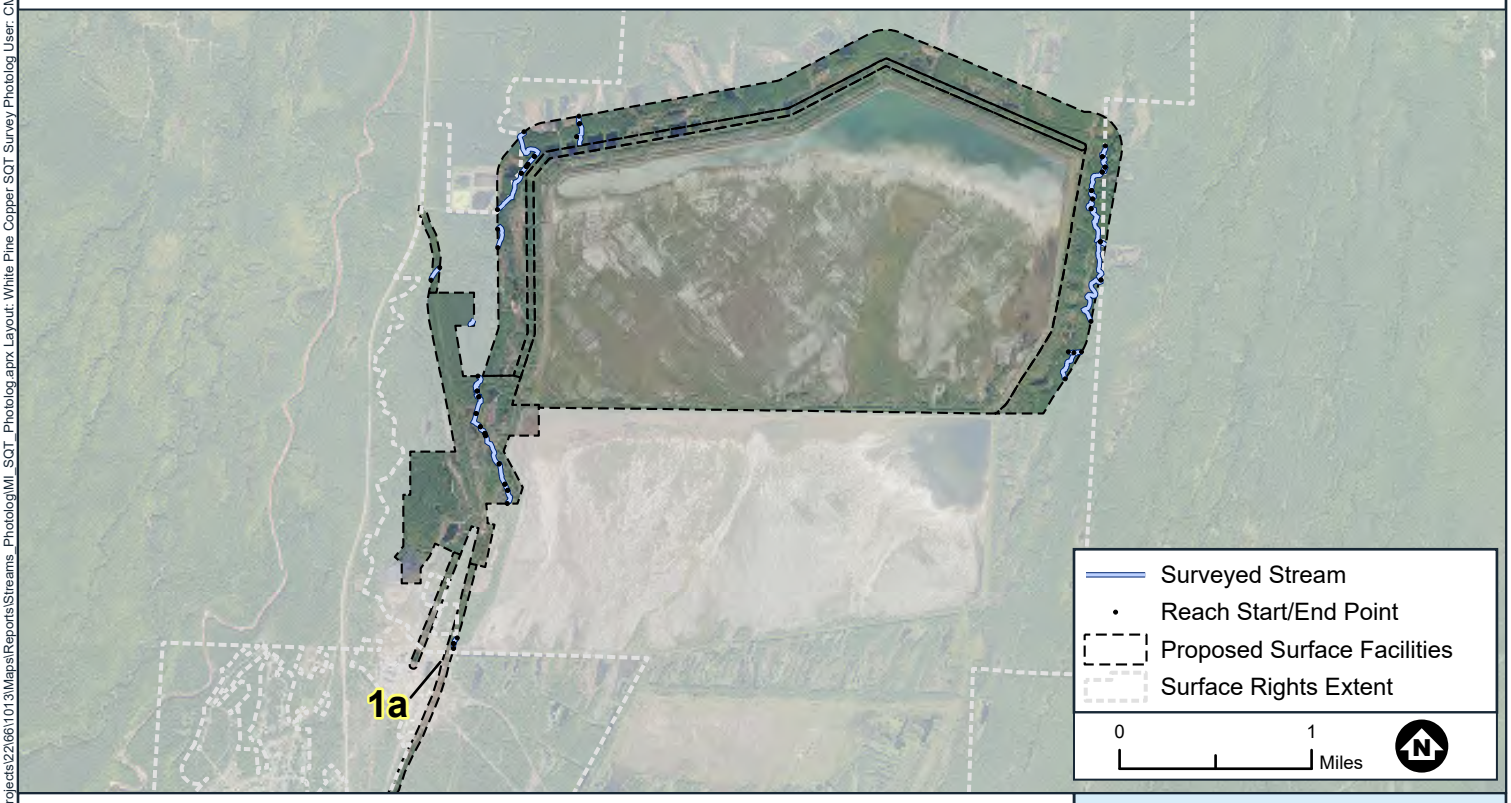
Photo caption: Start of Reach, Looking Downstream

Stream SQT Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Bar Footer: ArcGISPro 3.4, 2025-01-06 15:55 File: I:\Projects\23166\1013\Maps\Reports\Streams_Photolog\MI_SQT_Photolog.aprx Layout: White Pine Copper SQT Survey Photolog User: CML3





Reach: 1a

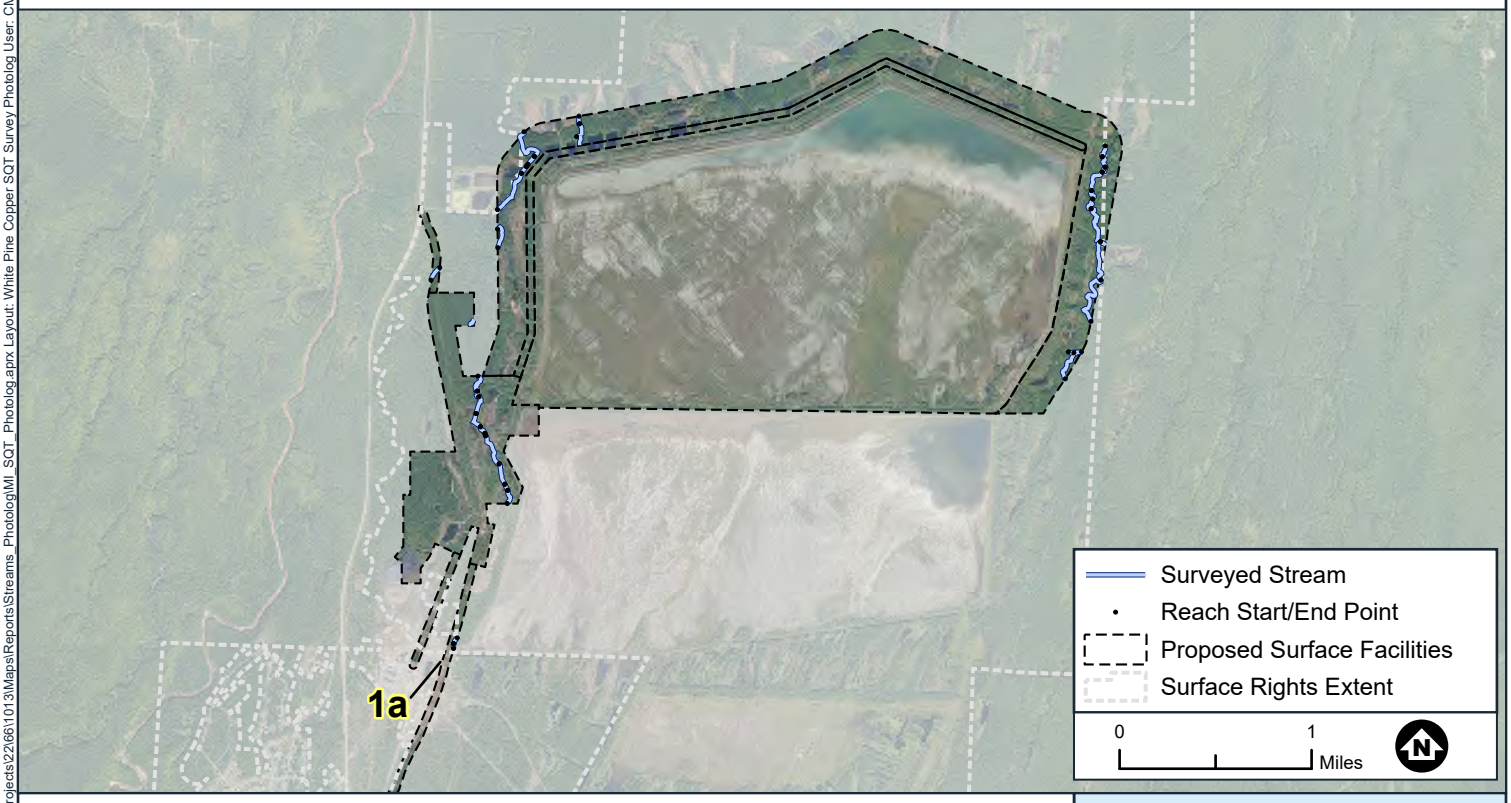
Photo caption: Representative Riffle Cross Section

Stream SQT Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Bar Footer: ArcGISPro 3.4, 2025-01-06 15:55 File: I:\Projects\22166\1013\Maps\Reports\Streams_Photolog\MI_SQT_Photolog.aprx Layout: White Pine Copper SQT Survey Photolog User: CML3





Reach: 1a

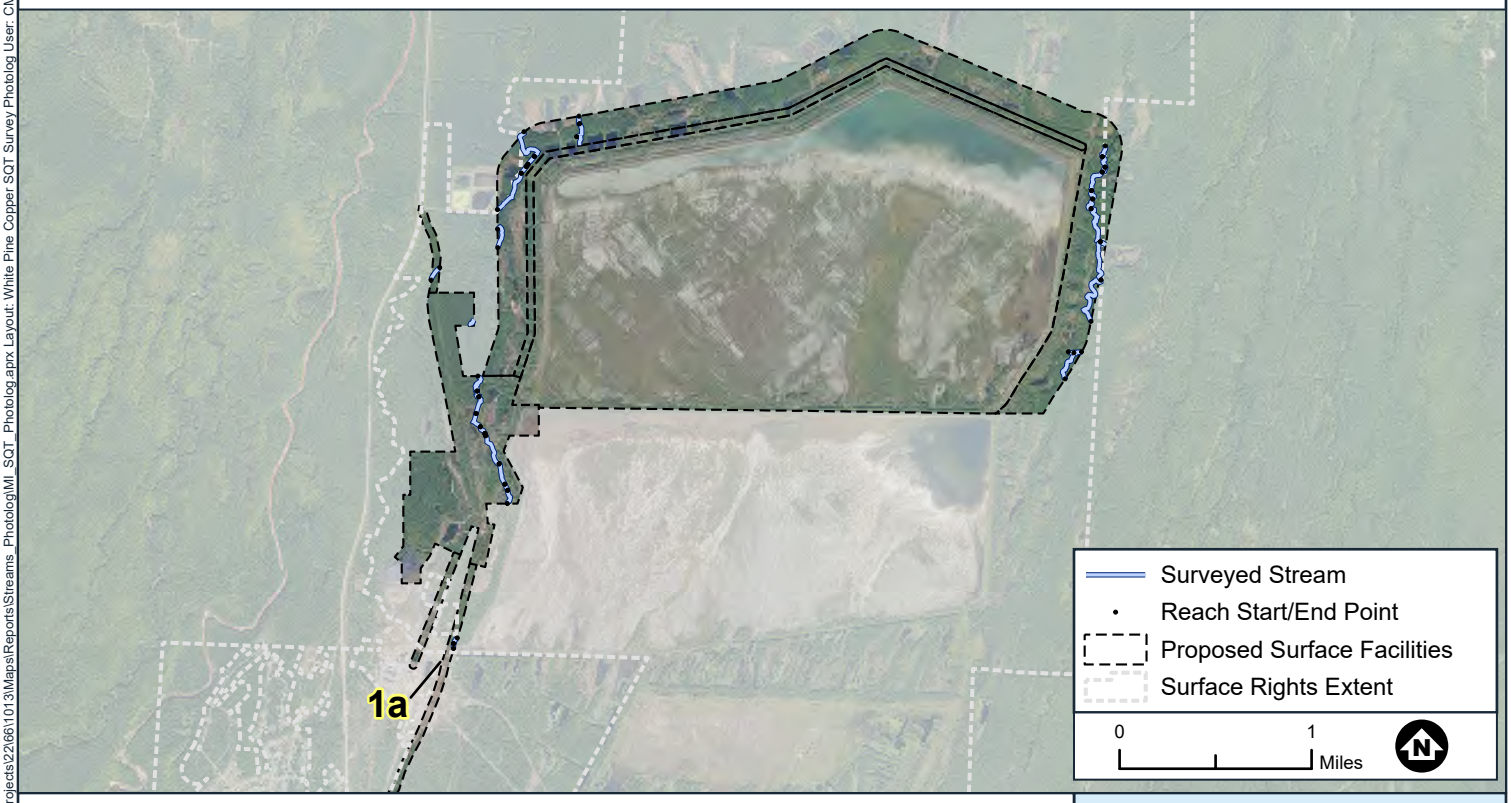
Photo caption: Start of Subreach, Looking Downstream

Stream SQT Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Bar Footer: ArcGISPro 3.4, 2025-01-06 15:55 File: I:\Projects\23166\1013\Maps\Reports\Streams_Photolog\MI_SQT_Photolog.aprx Layout: White Pine Copper SQT Survey Photolog User: CML3





Reach: 1a

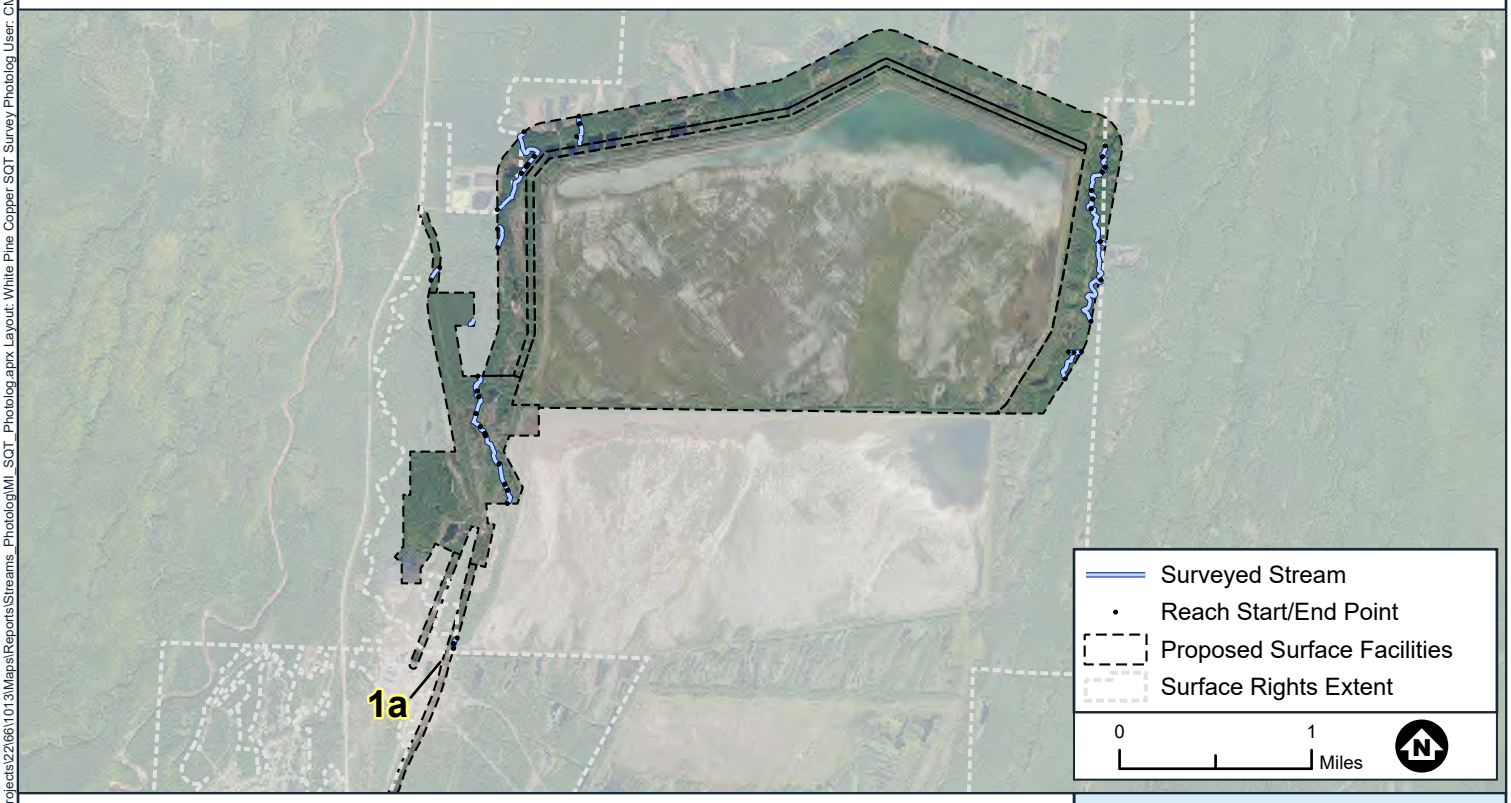
Photo caption: End of Subreach, Looking Upstream

Stream SQT Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Bar Footer: ArcGISPro 3.4, 2025-01-06 15:55 File: I:\Projects\22166\1013\Maps\Reports\Streams_Photolog\MI_SQT_Photolog.aprx Layout: White Pine Copper SQT Survey Photolog User: CML3





Reach: 1a

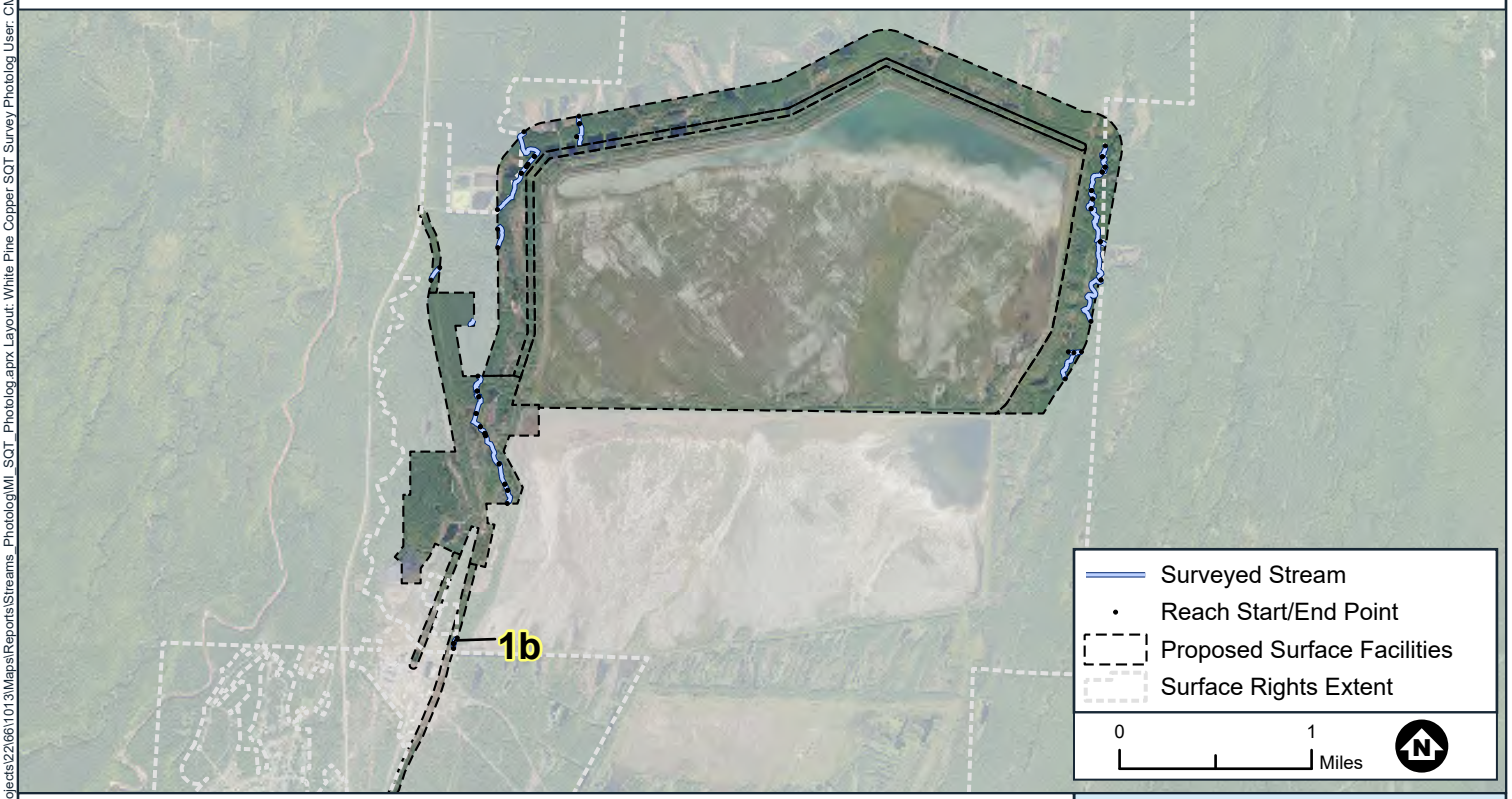
Photo caption: Streambank Assessed for Erosion

Stream SQT Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Barr Footer: ArcGISPro 3.4, 2025-01-06 15:55 File: I:\Projects\23166\1013\Maps\Reports\Streams_Photolog\MI_SQT_Photolog.aprx Layout: White Pine Copper SQT Survey Photolog User: CML3





Reach: 1b

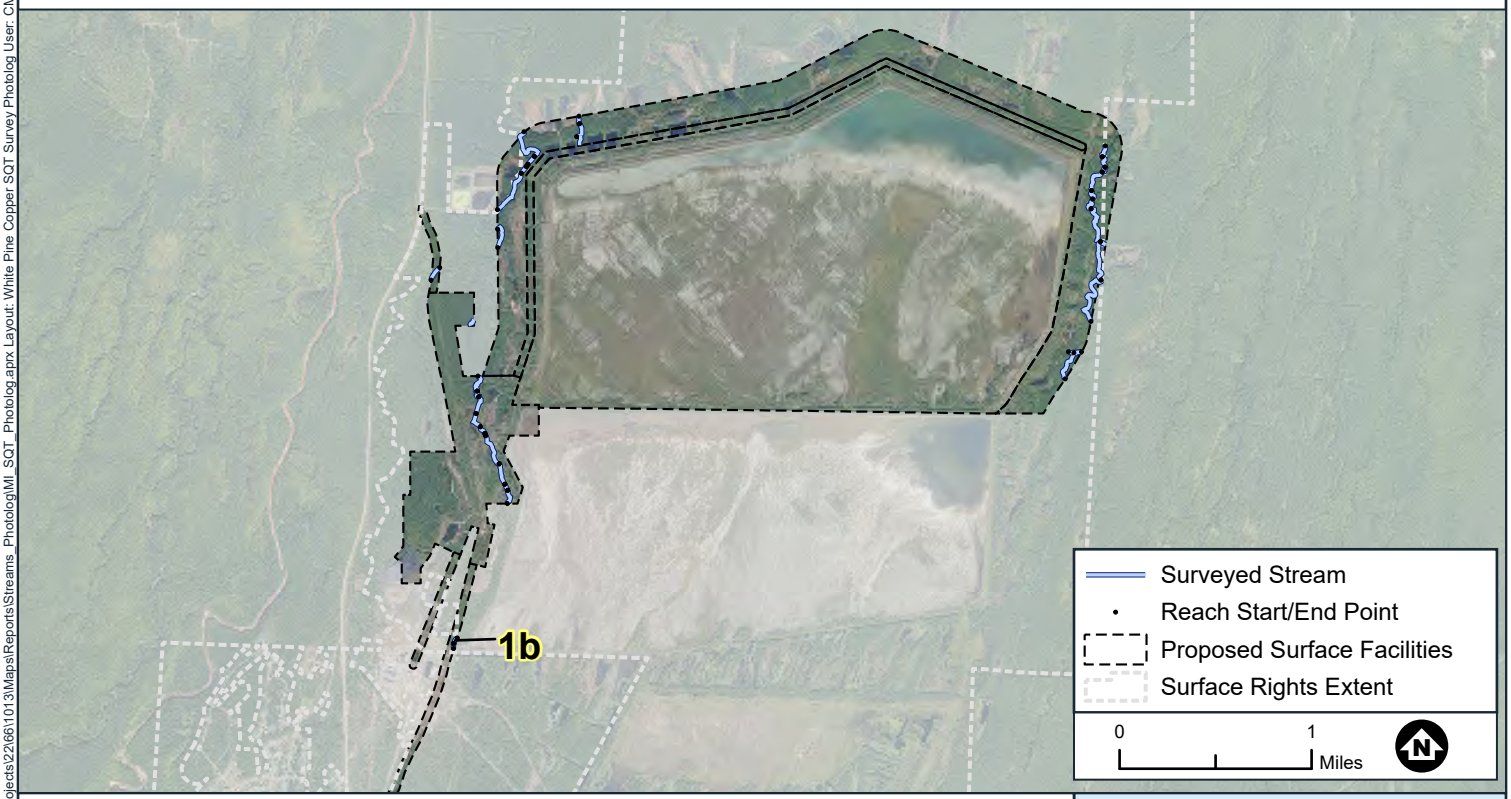
Photo caption: Start of Reach, Looking Downstream

Stream SQT Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Bar Footer: ArcGISPro 3.4, 2025-01-06 15:55 File: I:\Projects\23266\1013\Maps\Reports\Streams_Photolog\MI_SQT_Photolog.aprx Layout: White Pine Copper SQT Survey Photolog User: CML3





Reach: 1b

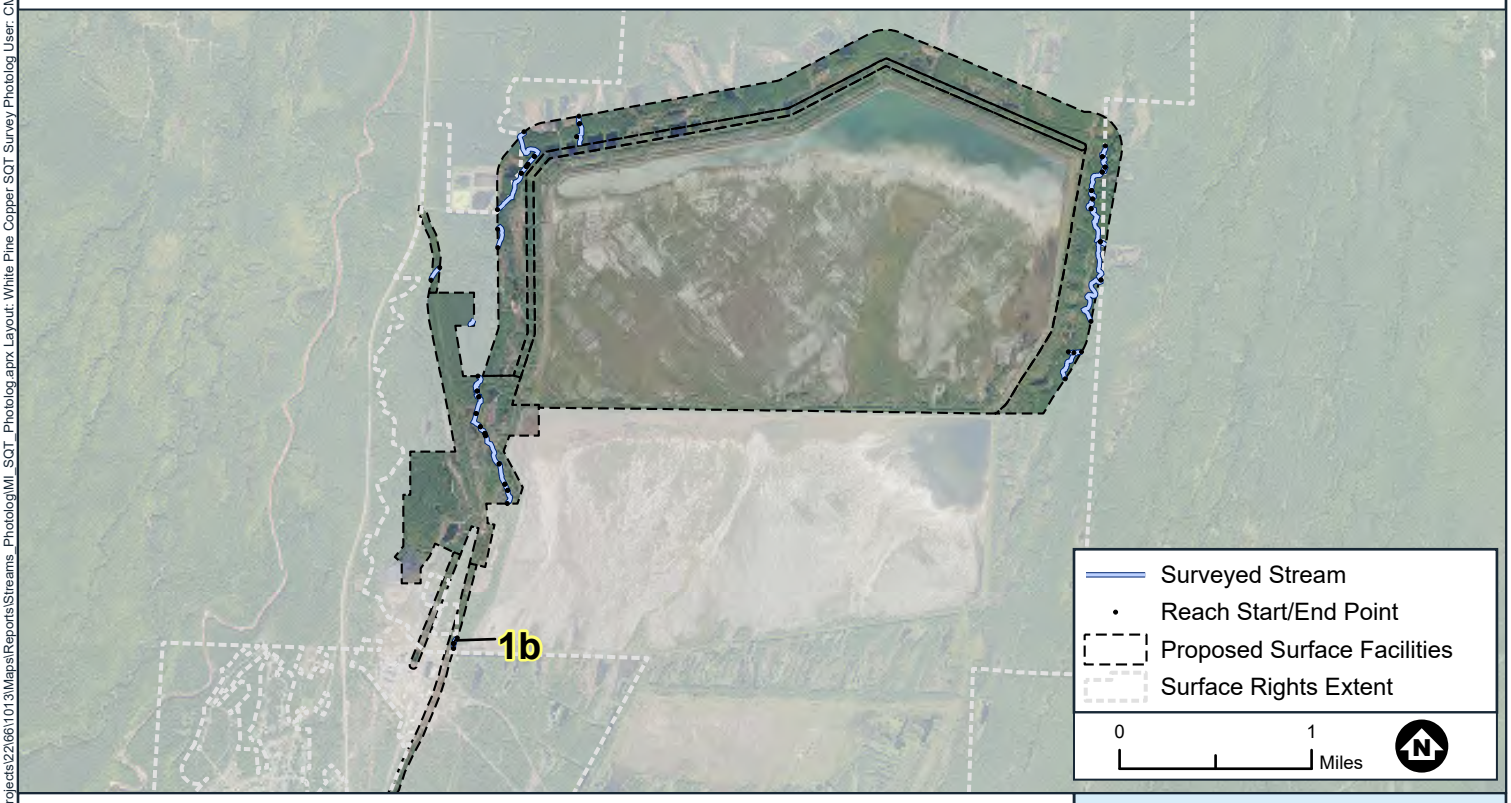
Photo caption: Representative Riffle Cross Section

Stream SQT Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Bar Footer: ArcGISPro 3.4, 2025-01-06 15:55 File: I:\Projects\23166\1013\Maps\Reports\Streams_Photolog\MI_SQT_Photolog.aprx Layout: White Pine Copper SQT Survey Photolog User: CML3





Reach: 1b

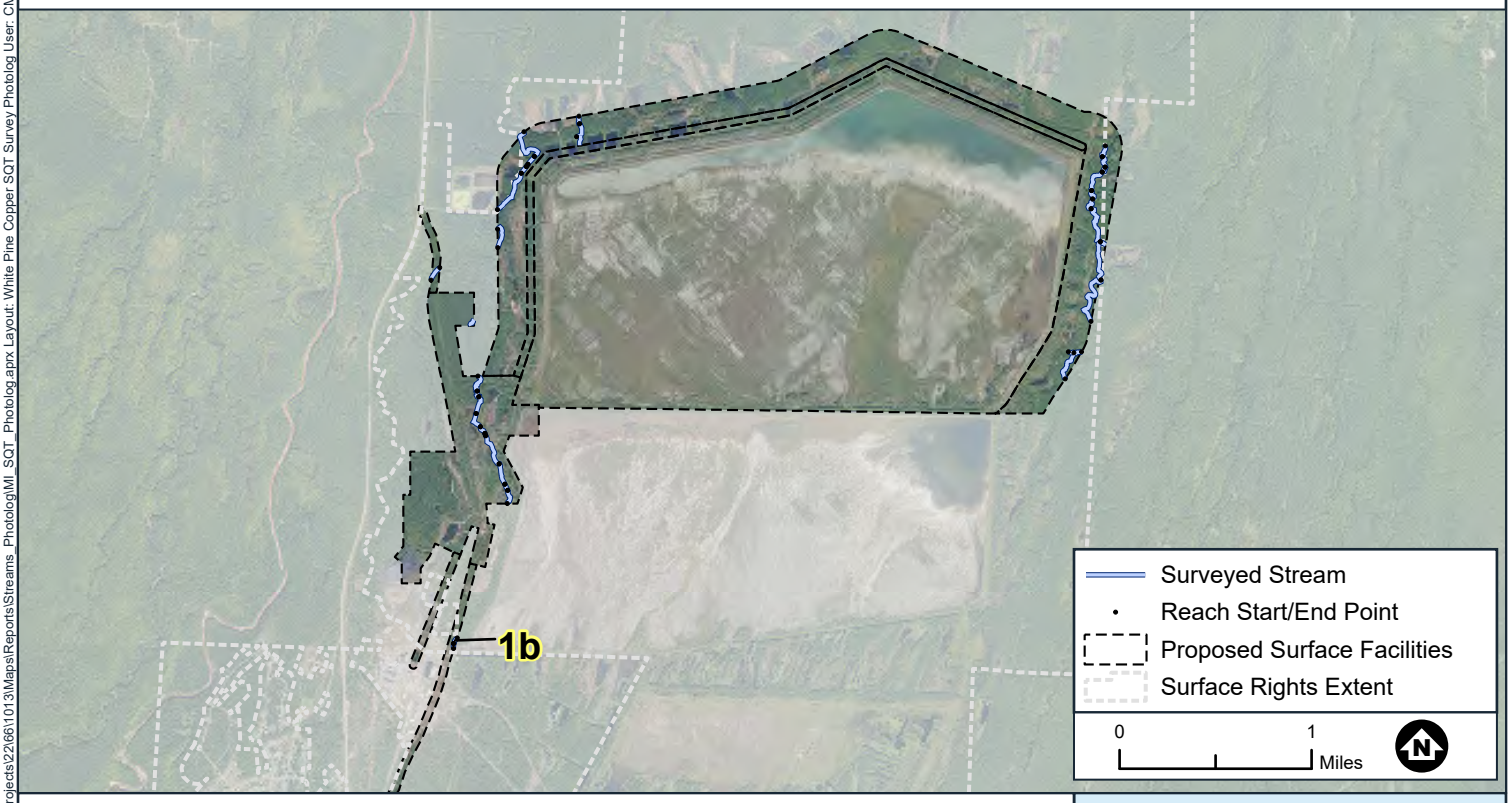
Photo caption: Streambank Assessed for Erosion

Stream SQT Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Bar Footer: ArcGISPro 3.4, 2025-01-06 15:55 File: I:\Projects\23166\1013\Maps\Reports\Streams_Photolog\MI_SQT_Photolog.aprx Layout: White Pine Copper SQT Survey Photolog User: CML3





Reach: 1b

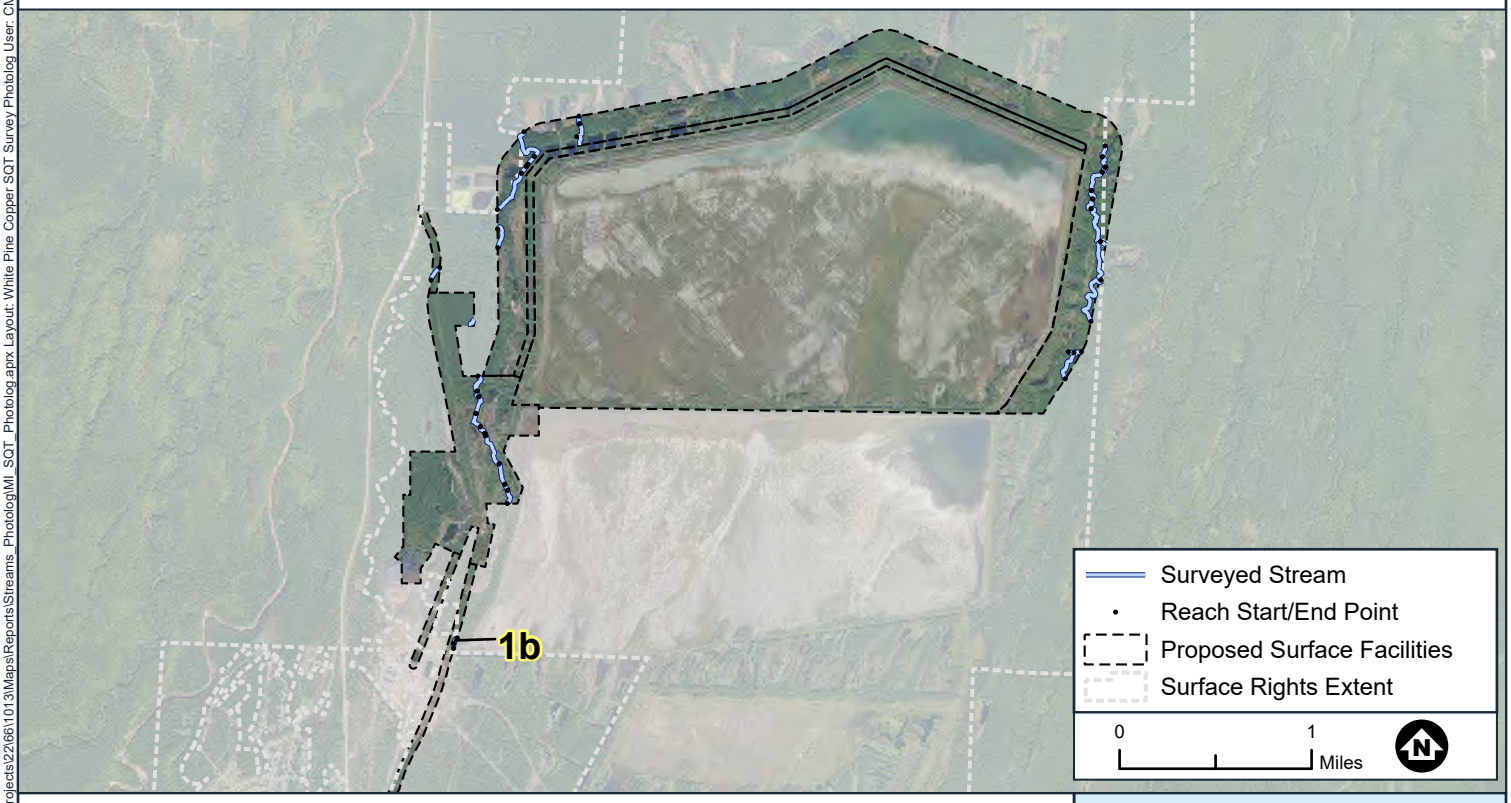
Photo caption: Streambank Assessed for Erosion

Stream SQT Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Bar Footer: ArcGISPro 3.4, 2025-01-06 15:55 File: I:\Projects\23166\1013\Maps\Reports\Streams_Photolog\MI_SQT_Photolog.aprx Layout: White Pine Copper SQT Survey Photolog User: CML3





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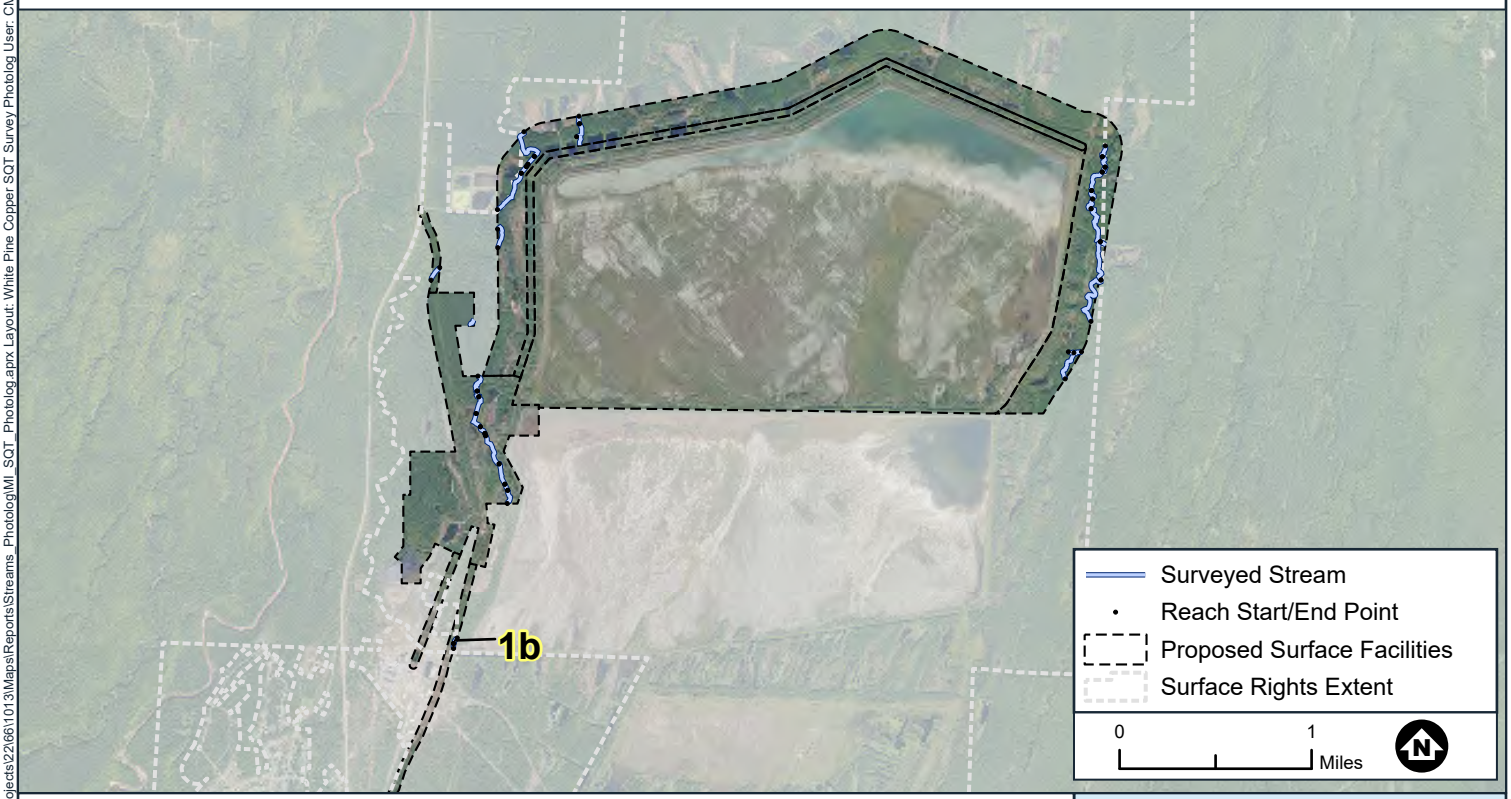
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Stream SQT Survey
Photo Log
White Pine North
White Pine Copper, LLC
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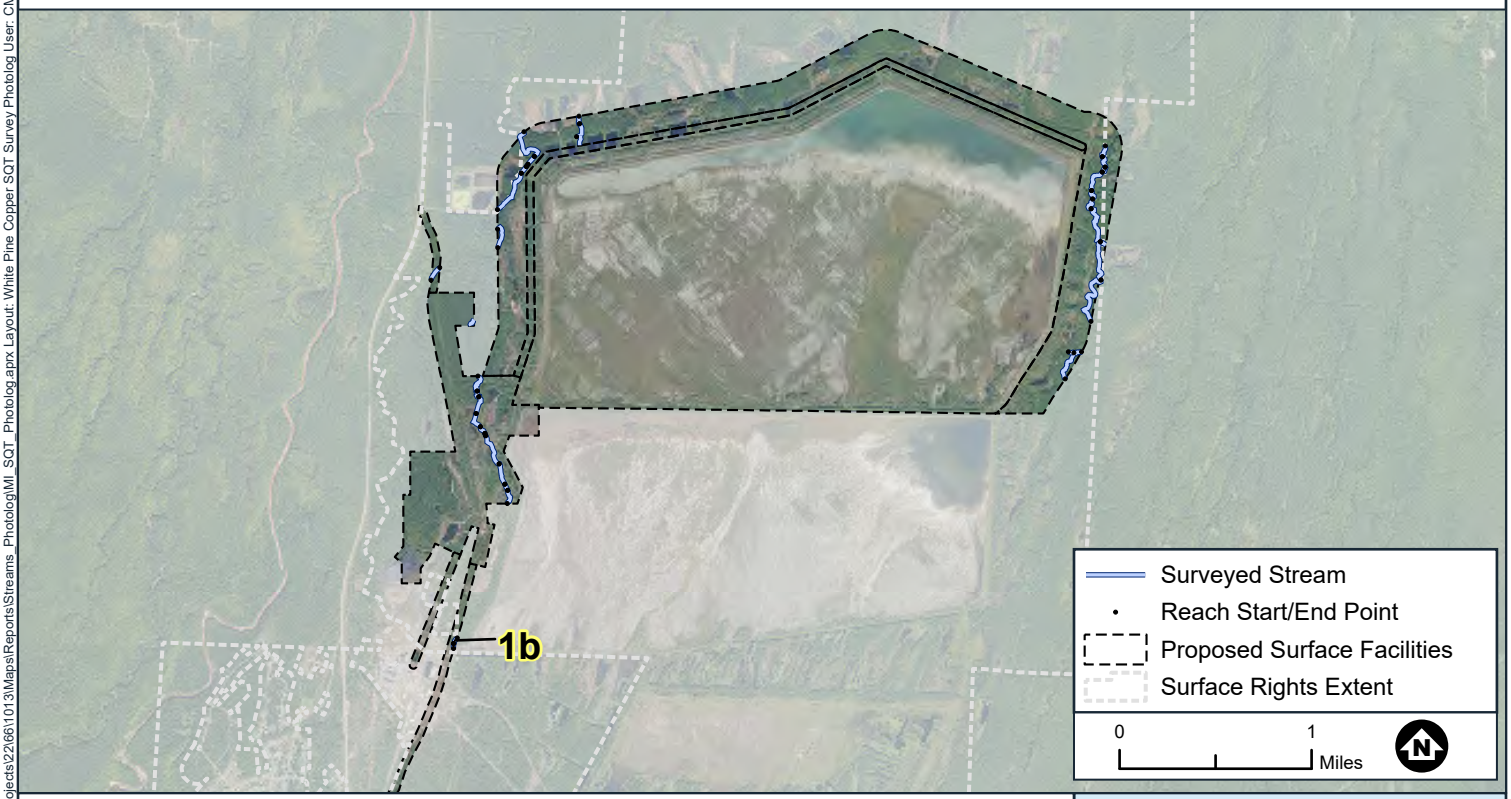
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Photo Log
White Pine North
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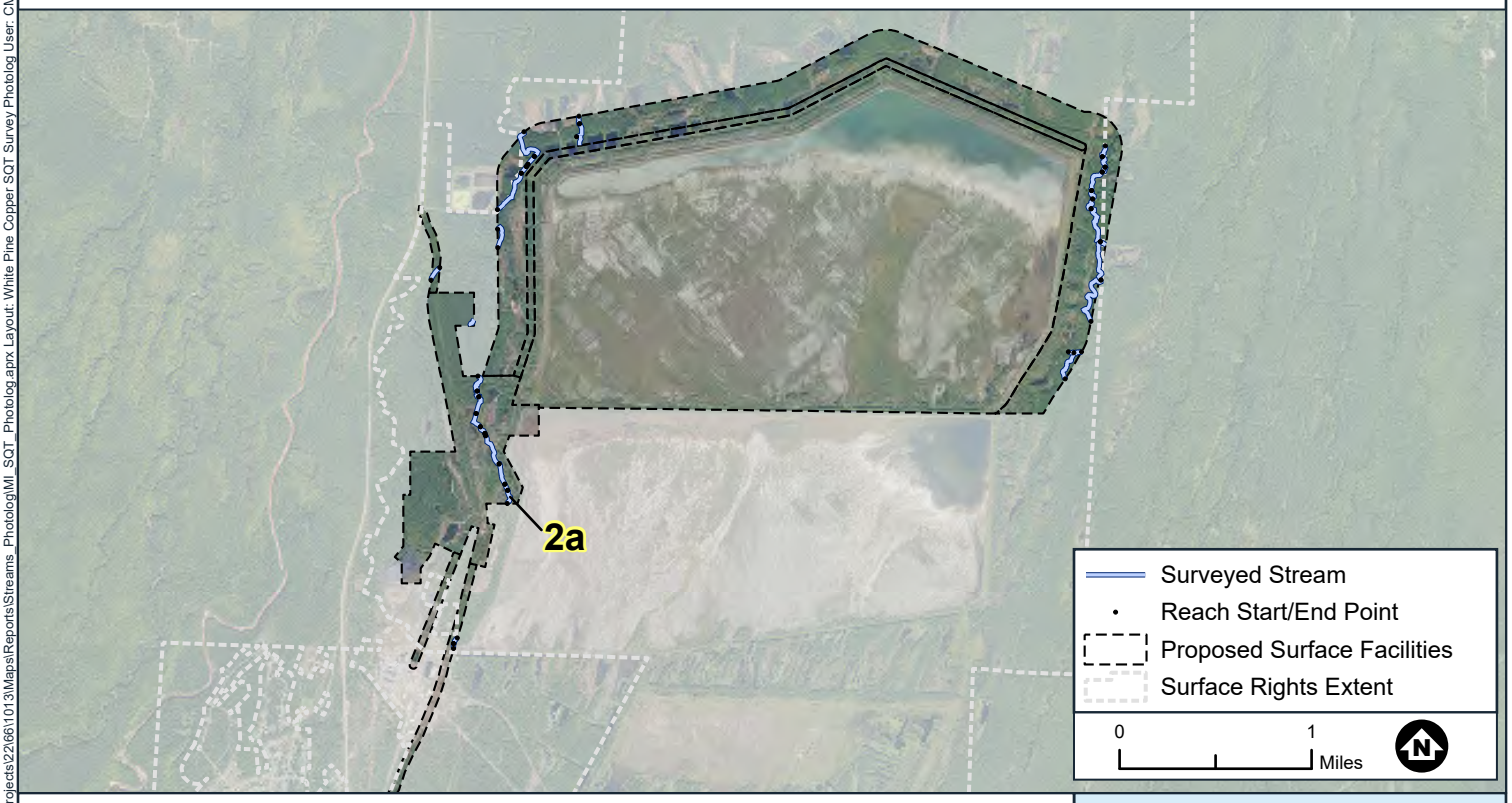
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White Pine North
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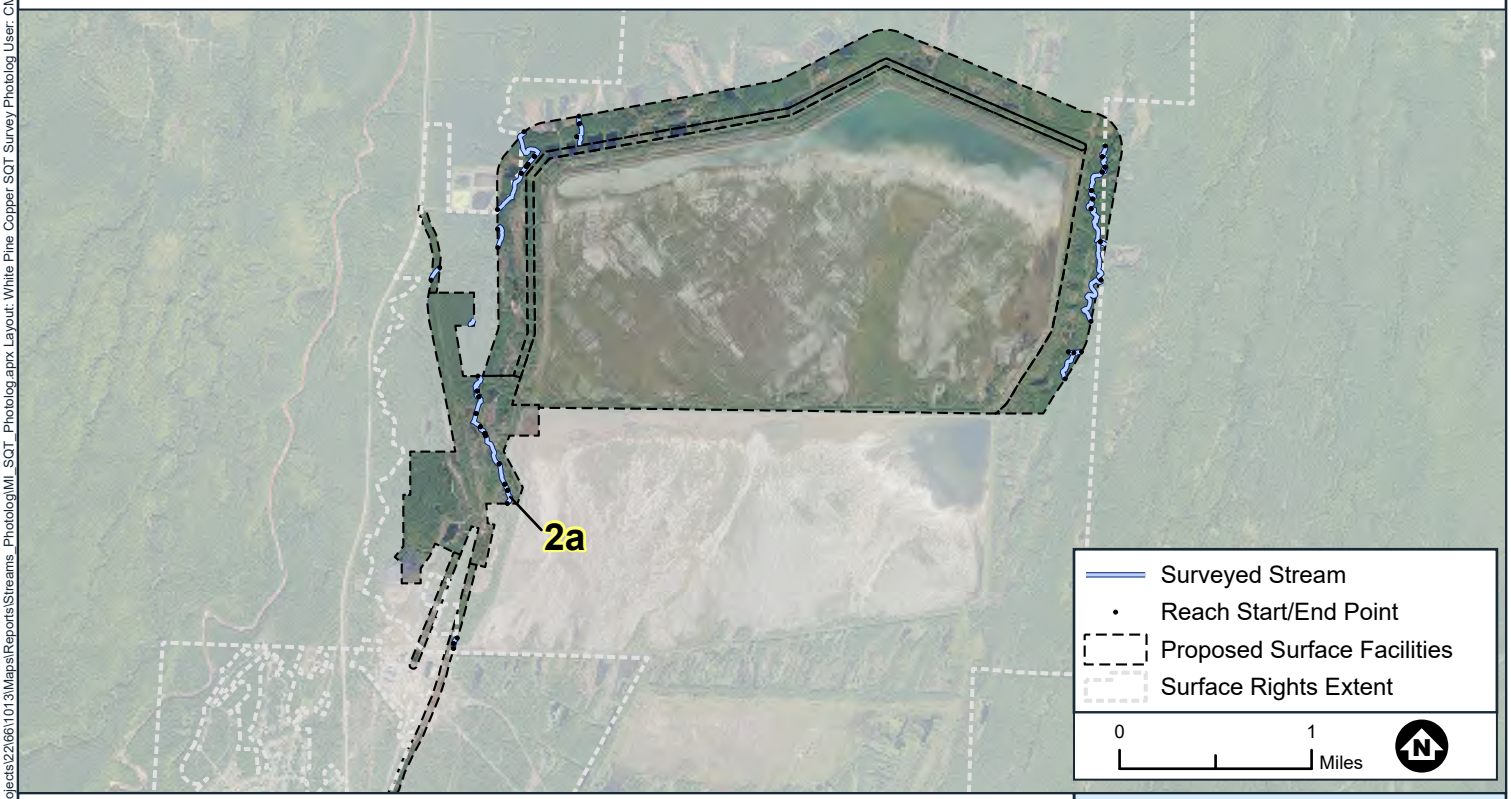
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Stream SQT Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

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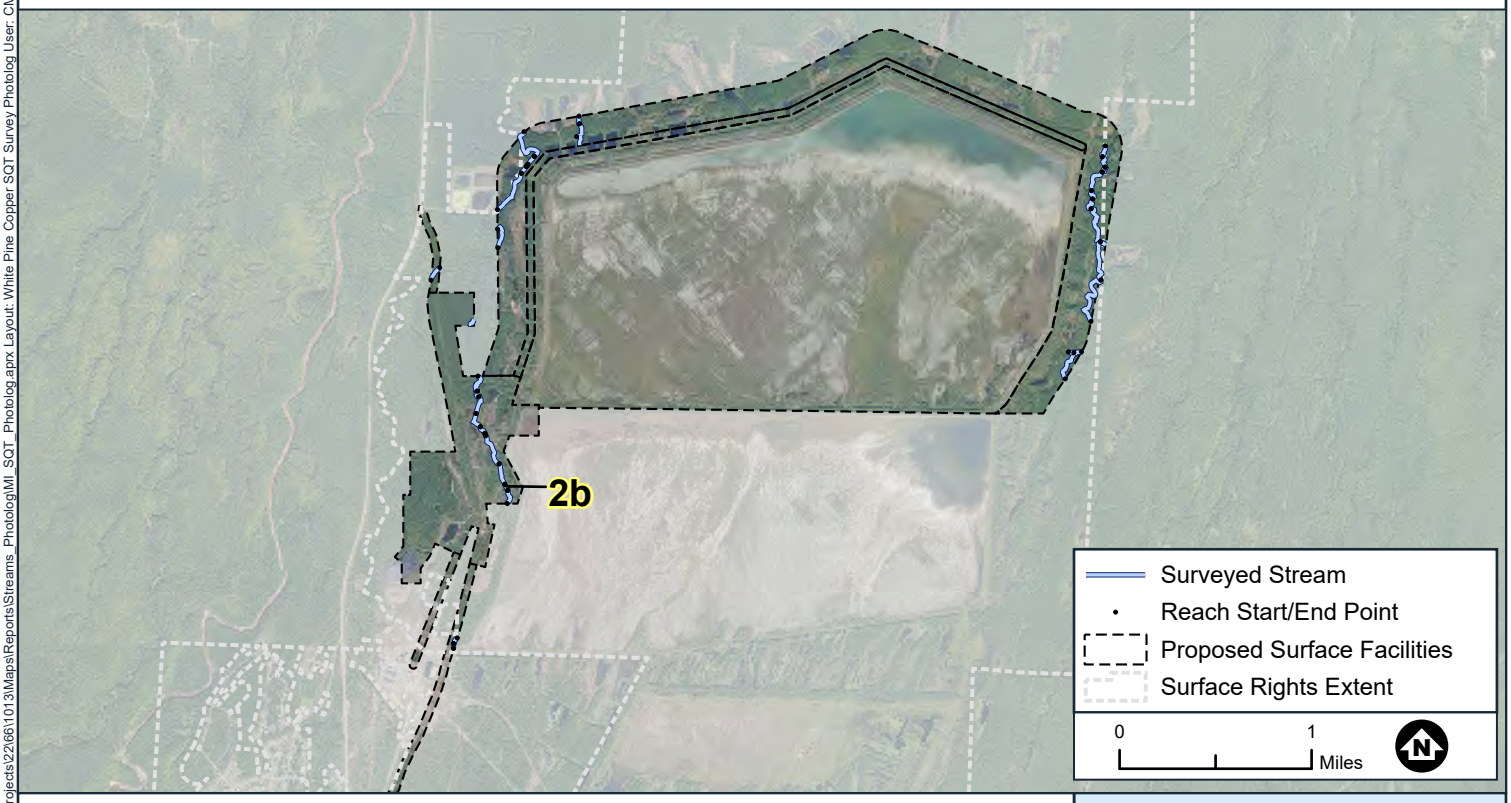
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White Pine North
White Pine Copper, LLC
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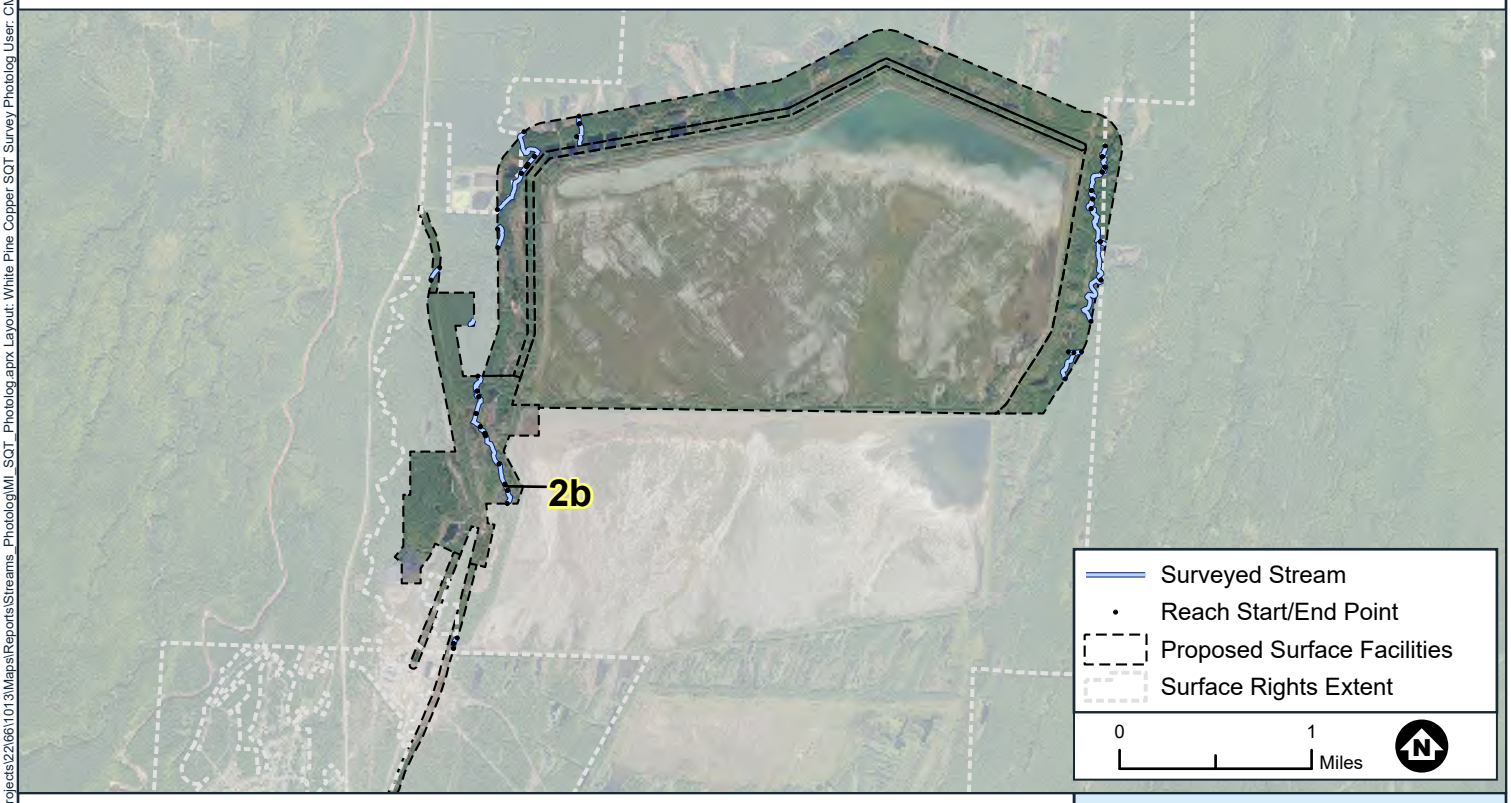
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Stream SQT Survey
Photo Log
White Pine North
White Pine Copper, LLC
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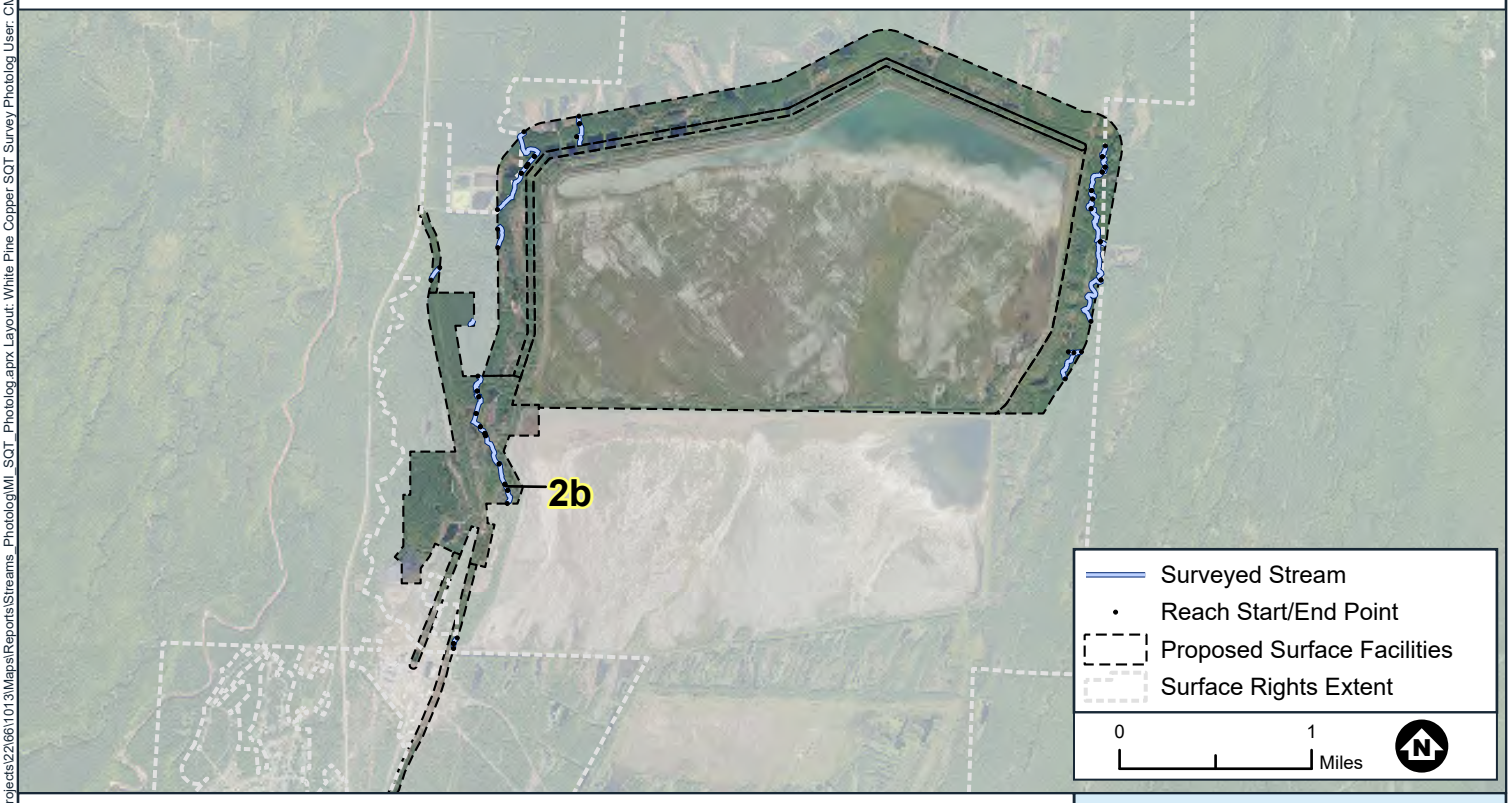
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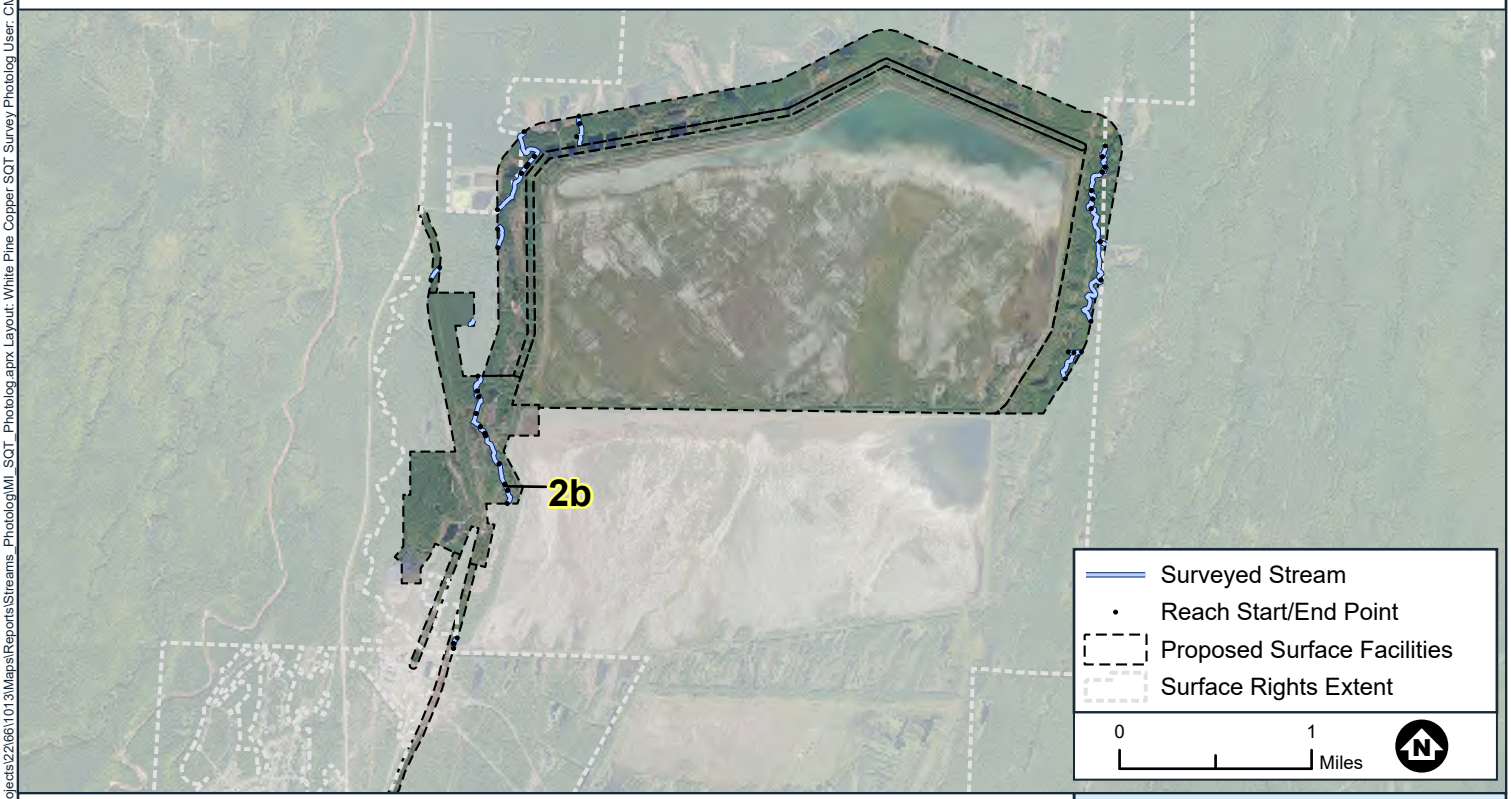
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Stream SQT Survey
Photo Log
White Pine North
White Pine Copper, LLC
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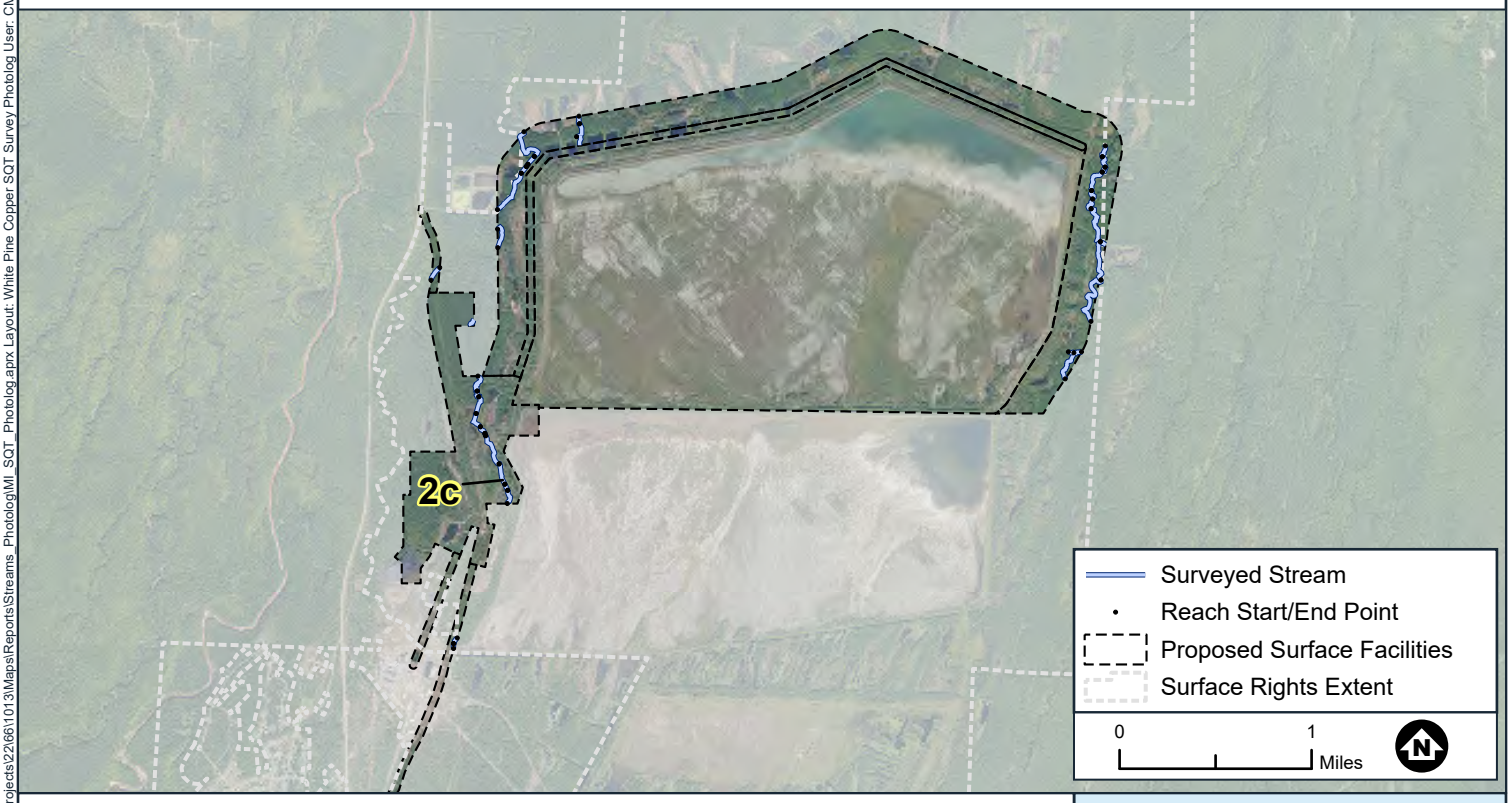
Photo caption: Streambank Assessed for Erosion

Stream SQT Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

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Reach: 2c

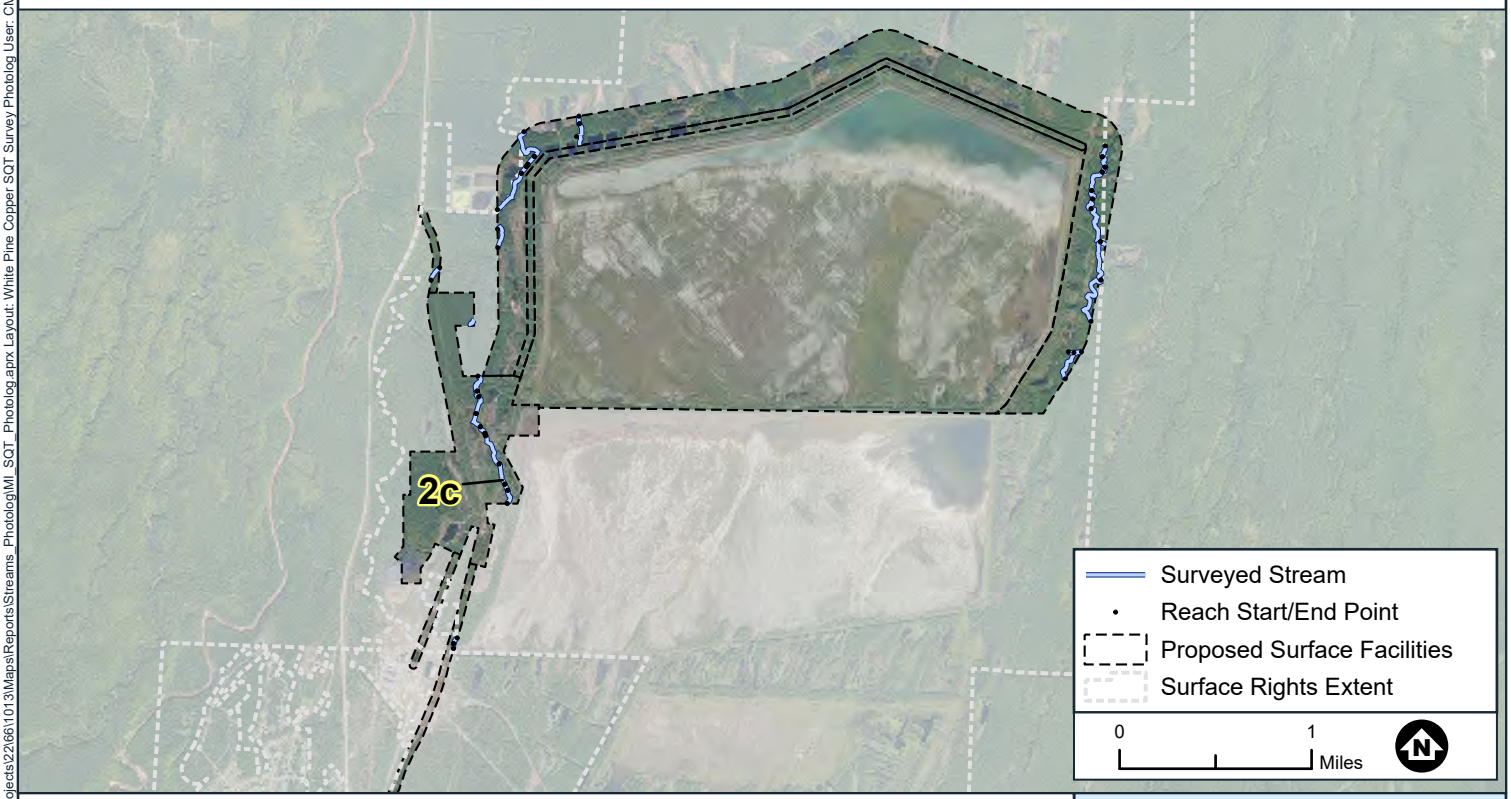
Photo caption: Representative Riffle Cross Section

Stream SQT Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

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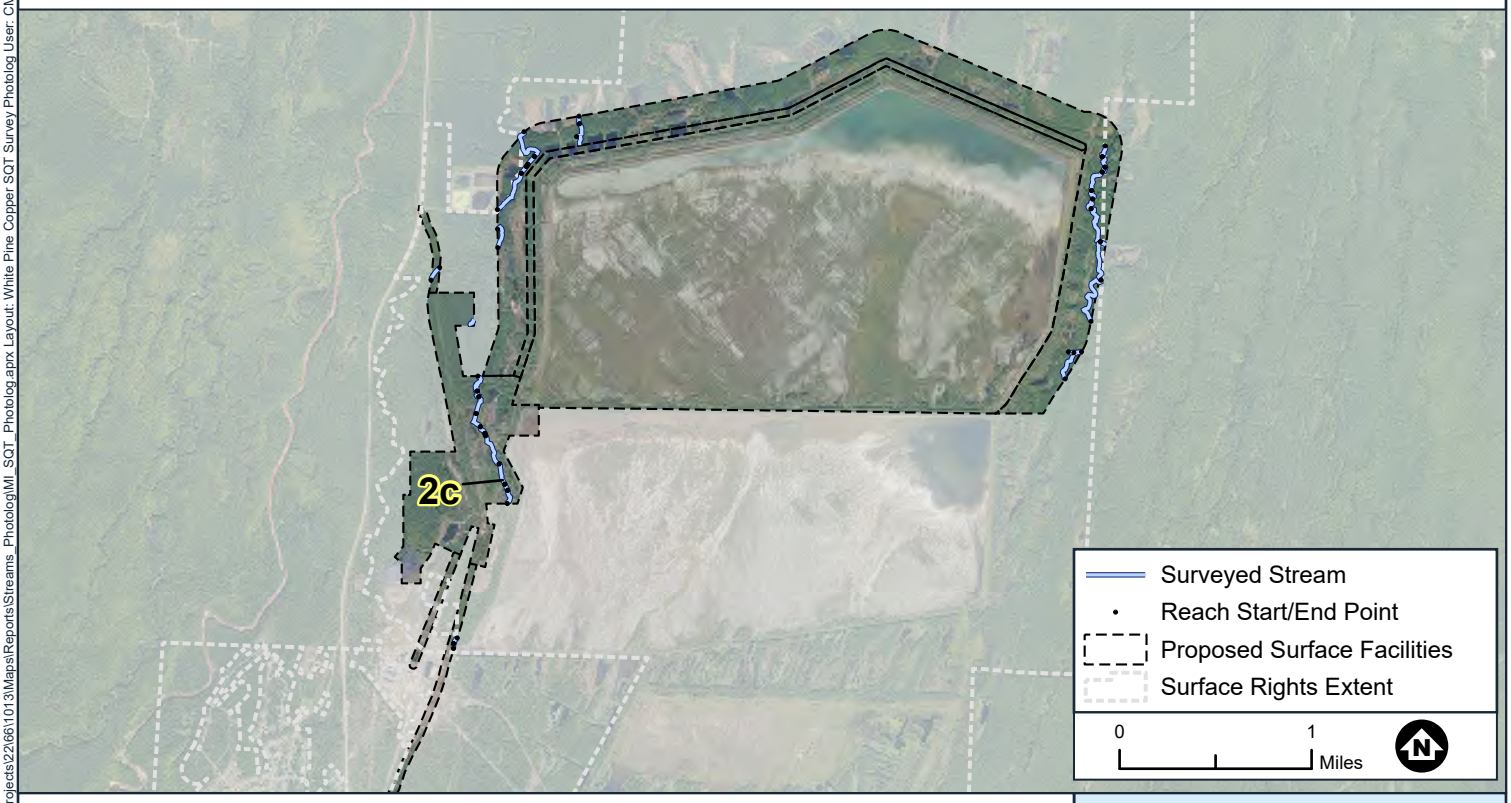
Photo caption: Start of Subreach, Looking Downstream

Stream SQT Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Bar Footer: ArcGISPro 3.4, 2025-01-06 15:55 File: I:\Projects\23166\1013\Maps\Reports\Streams_Photolog\MI_SQT_Photolog.aprx Layout: White Pine Copper SQT Survey Photolog User: CML3





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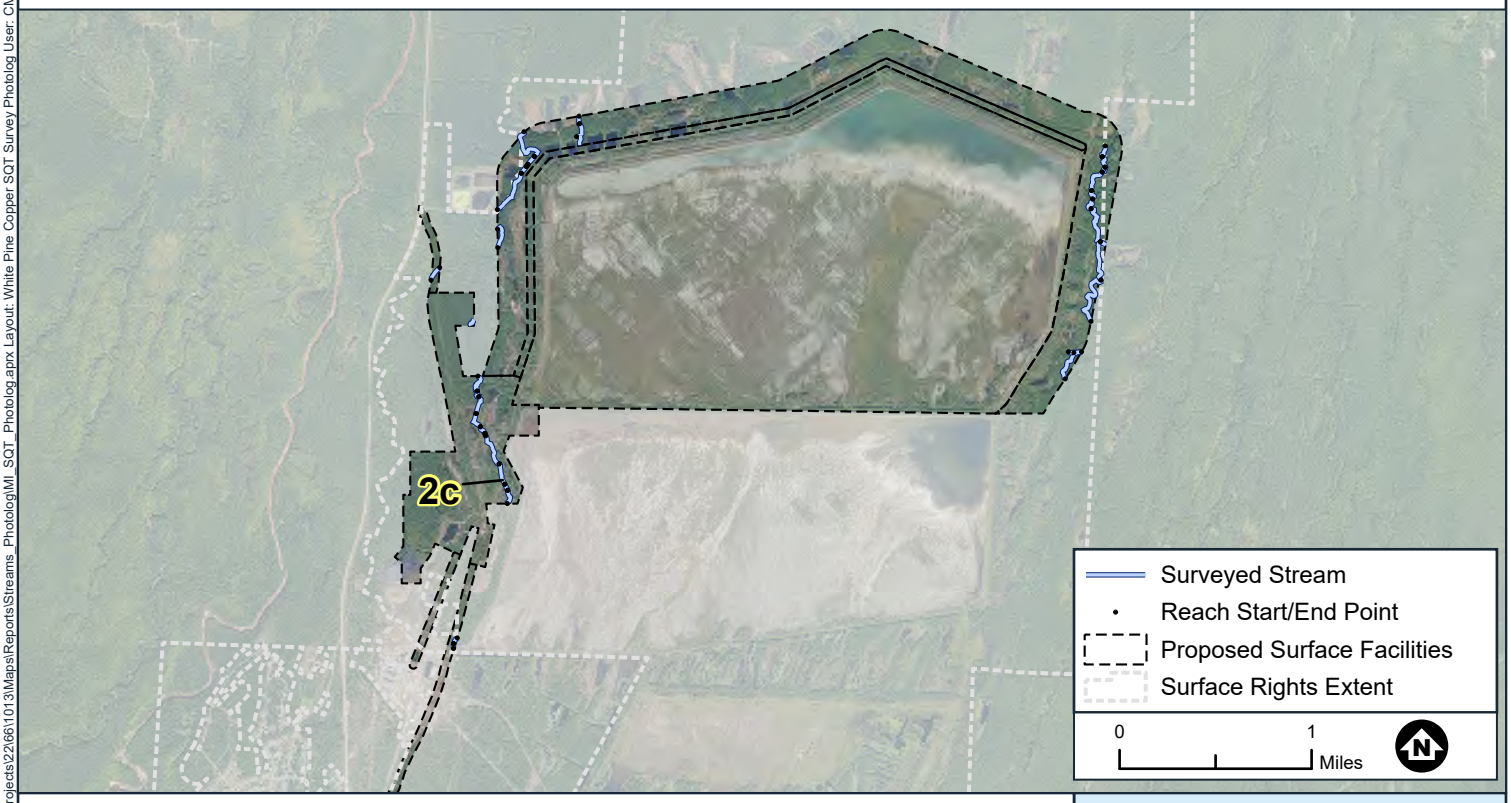
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Stream SQT Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

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Bar Footer: ArcGISPro 3.4, 2025-01-06 15:55 File: I:\Projects\22166\1013\Maps\Reports\Streams_Photolog\MI_SQT_Photolog.aprx Layout: White Pine Copper SQT Survey Photolog User: CML3





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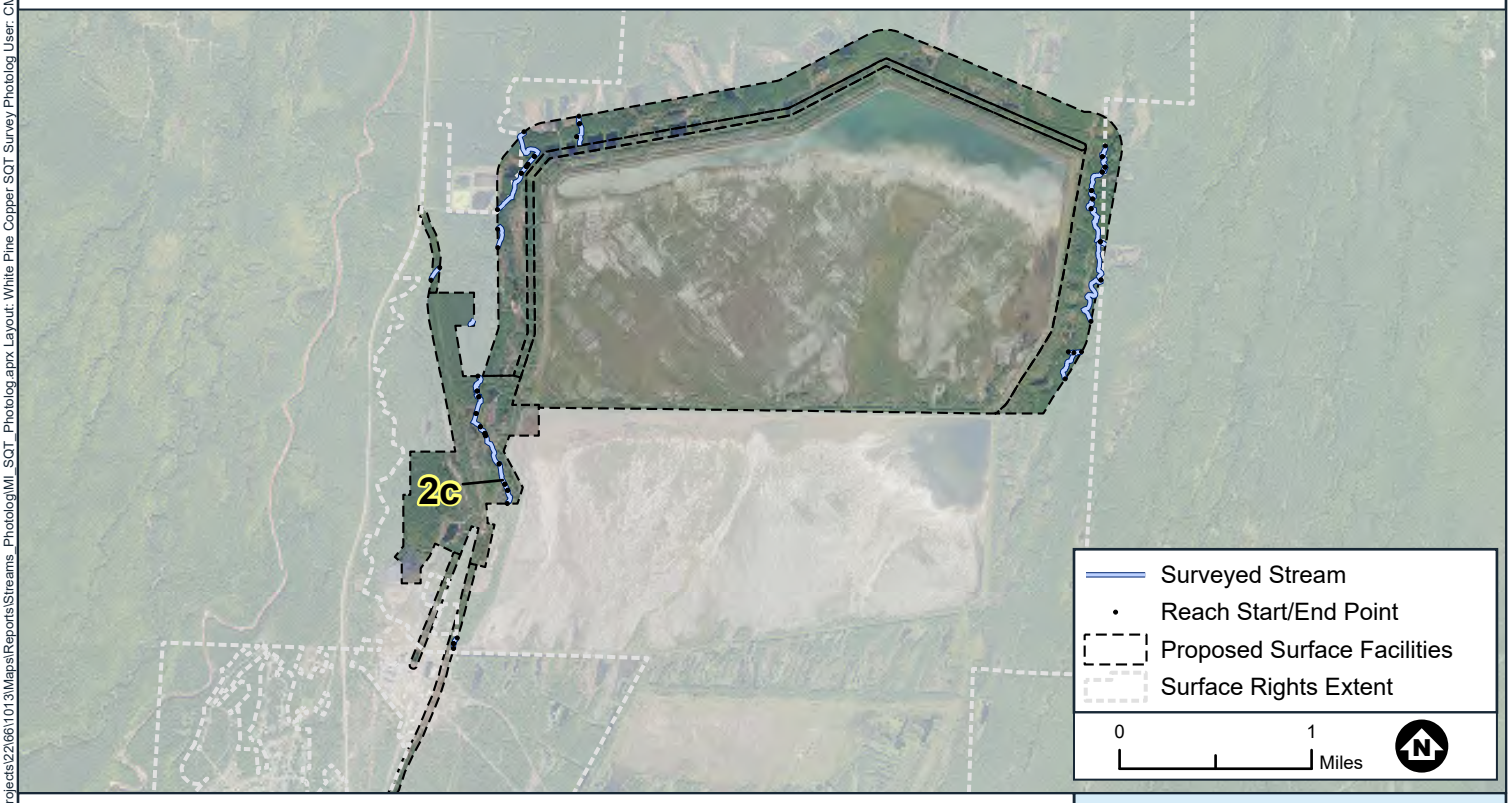
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Stream SQT Survey
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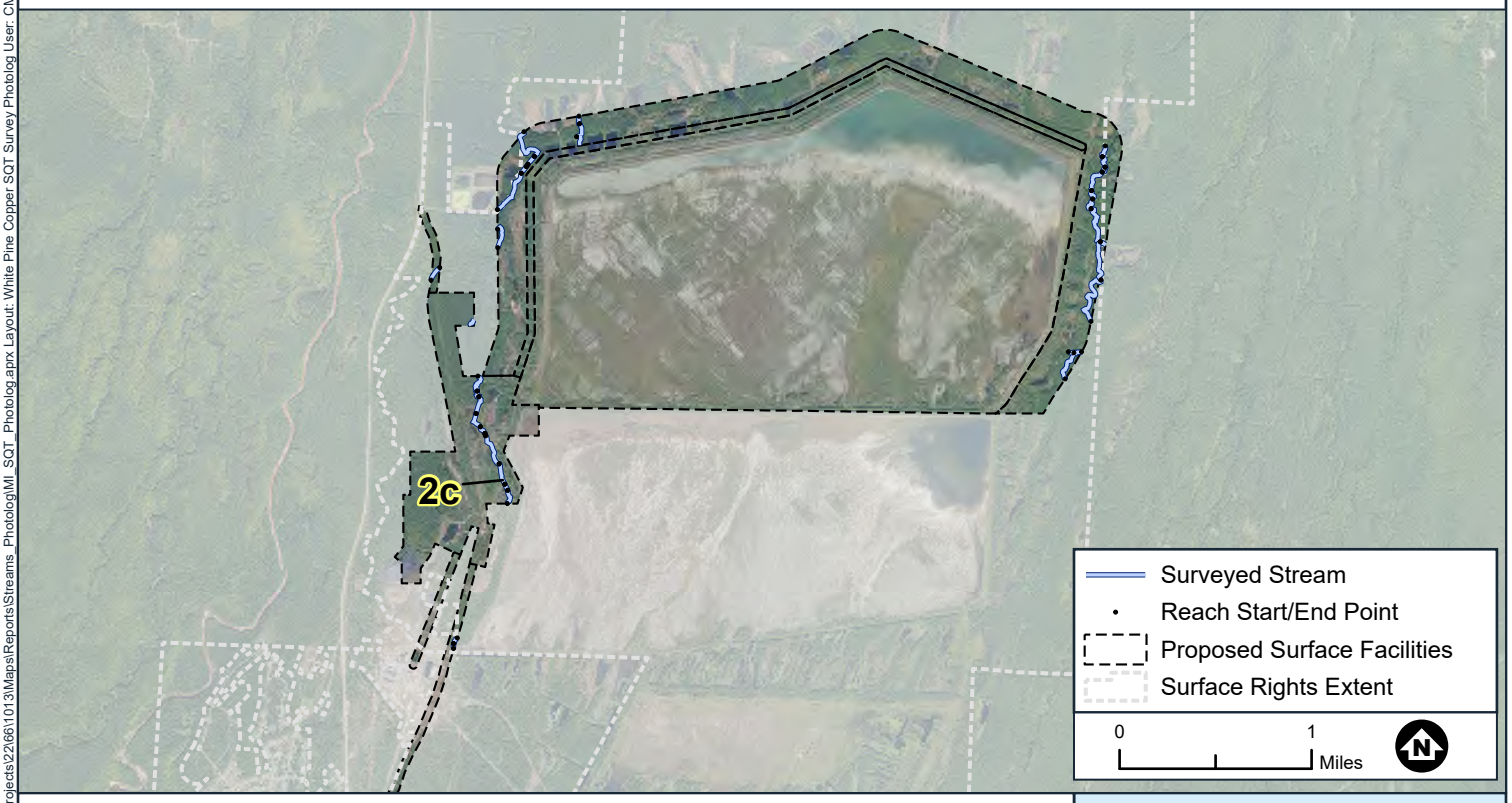
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Stream SQT Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
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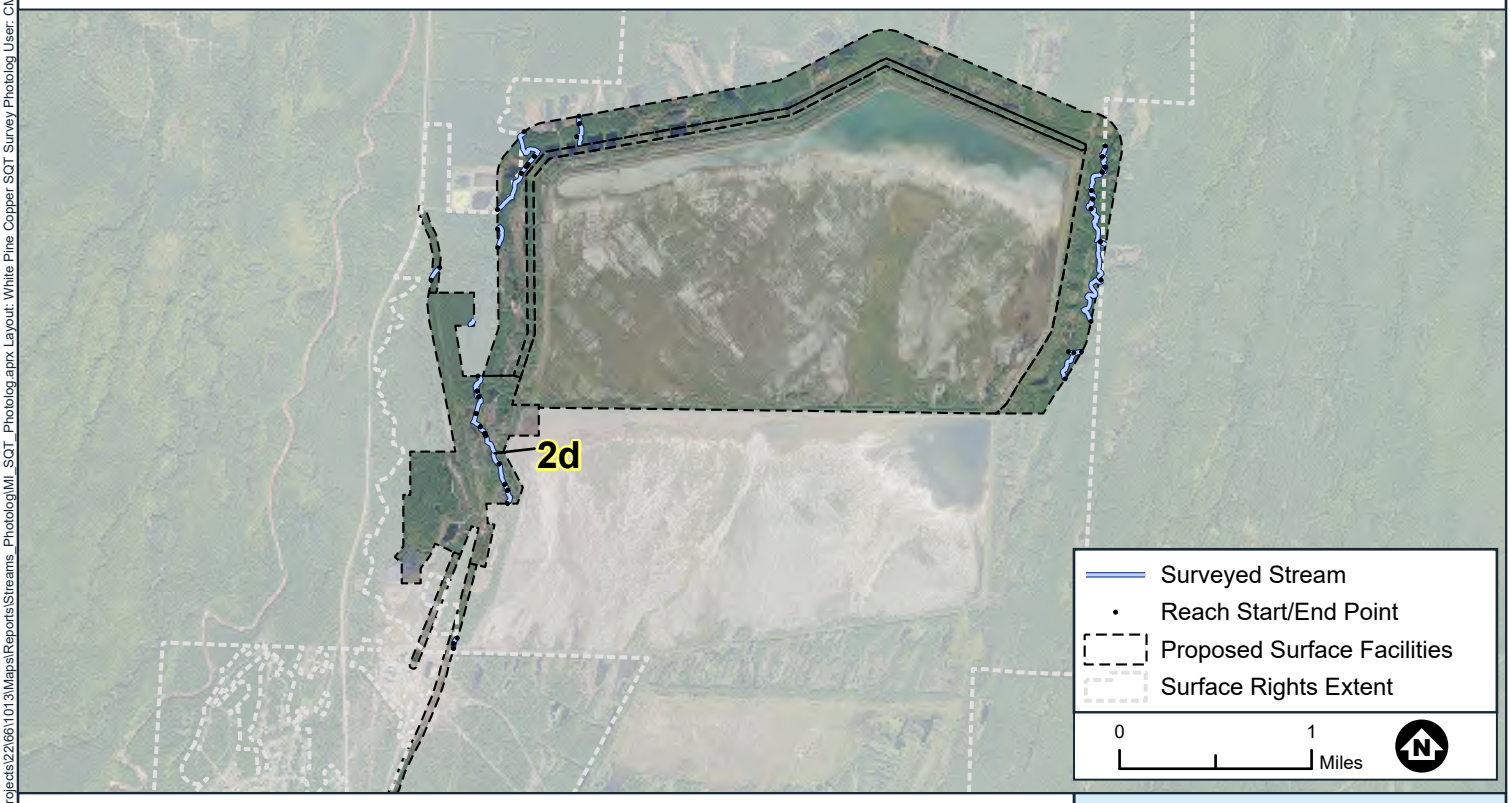
Photo caption: Streambank Assessed for Erosion

Stream SQT Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

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Reach: 2d

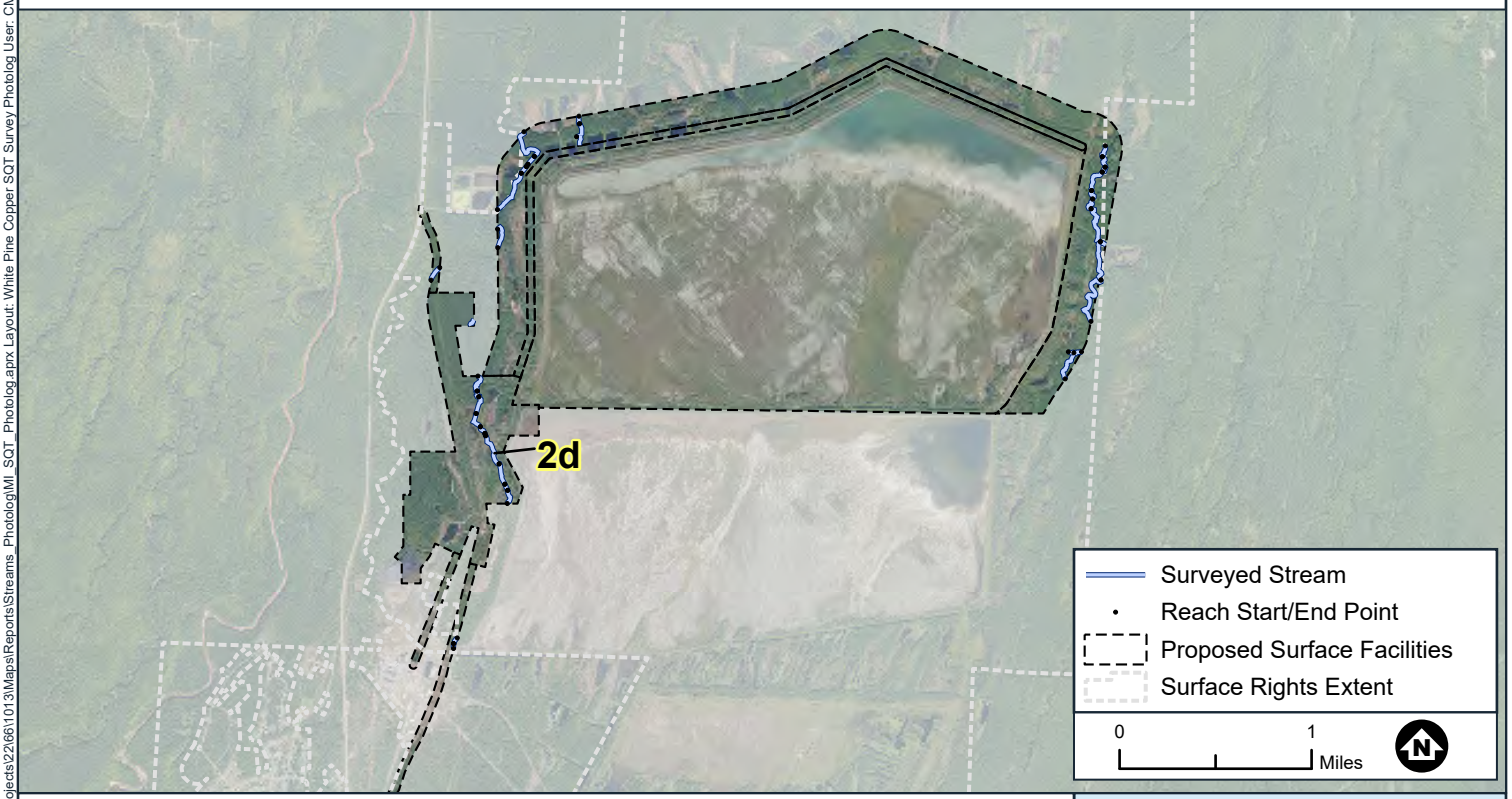
Photo caption: Start of Reach, Looking Downstream

Stream SQT Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

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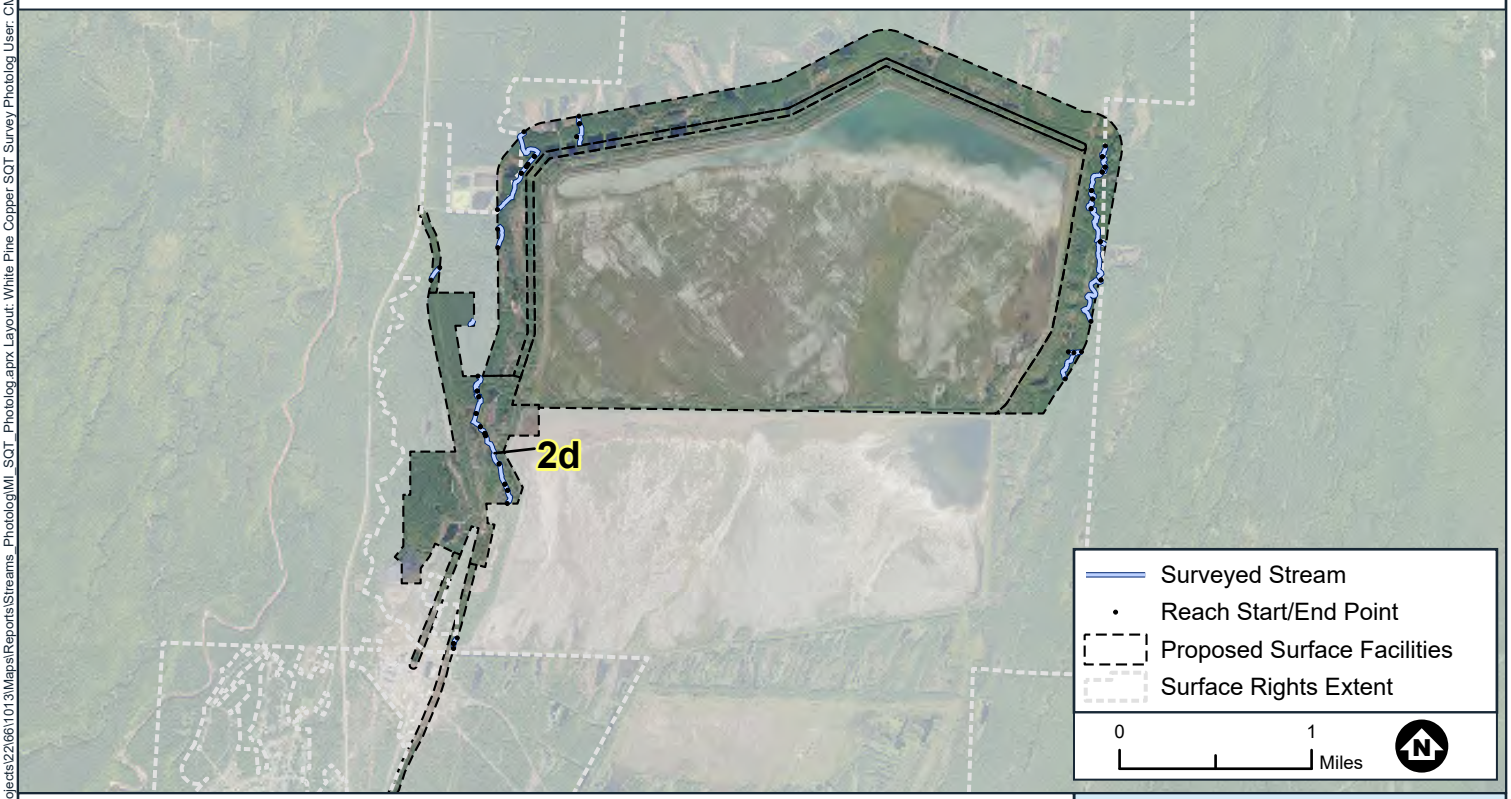
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Stream SQT Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Bar Footer: ArcGISPro 3.4, 2025-01-06 15:55 File: I:\Projects\23166\1013\Maps\Reports\Streams_Photolog\MI_SQT_Photolog.aprx Layout: White Pine Copper SQT Survey Photolog User: CML3





Reach: 2d

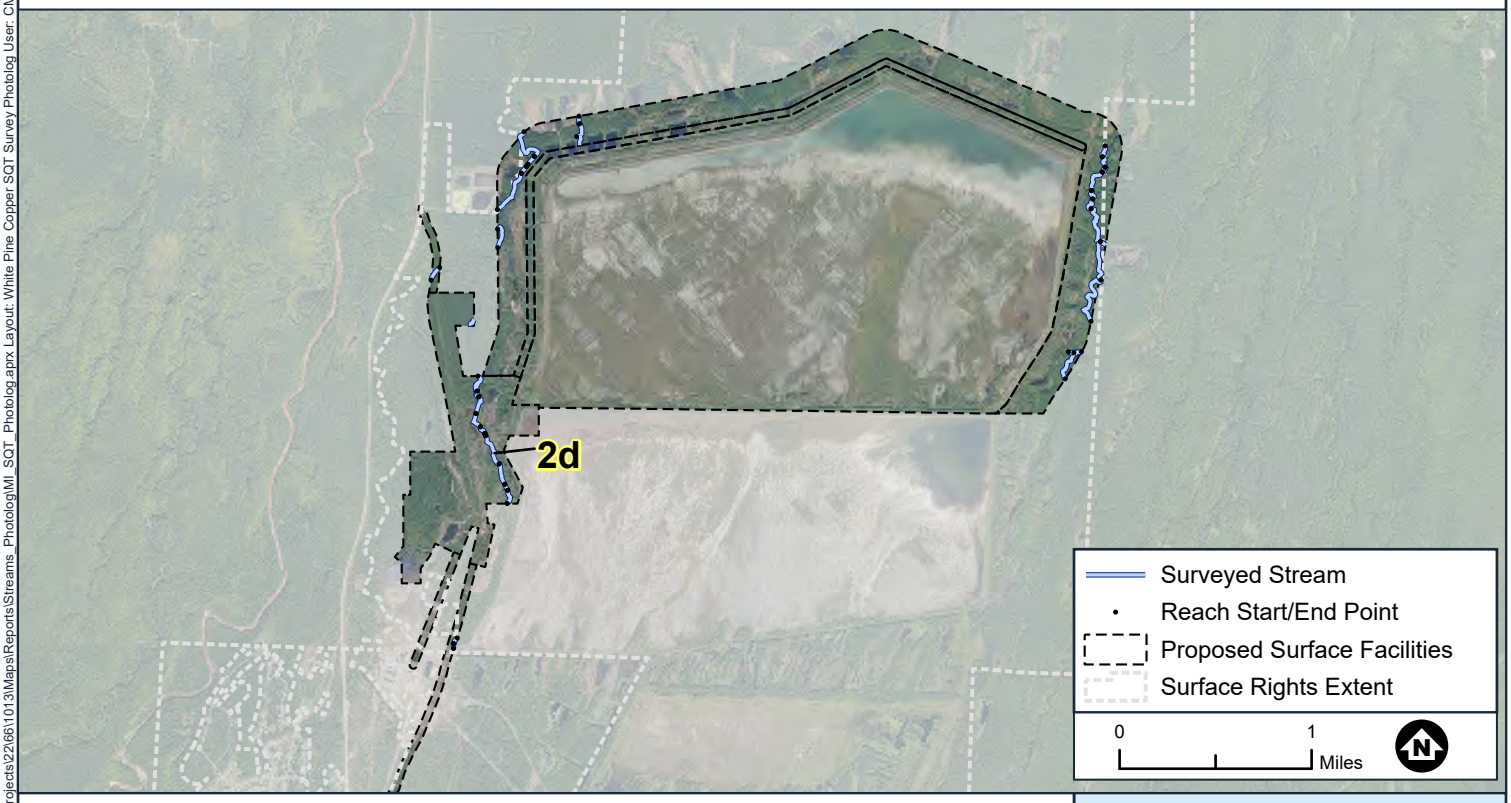
Photo caption: Representative Riffle Cross Section

Stream SQT Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Bar Footer: ArcGISPro 3.4, 2025-01-06 15:55 File: I:\Projects\23166\1013\Maps\Reports\Streams_Photolog\MI_SQT_Photolog.aprx Layout: White Pine Copper SQT Survey Photolog User: CML3





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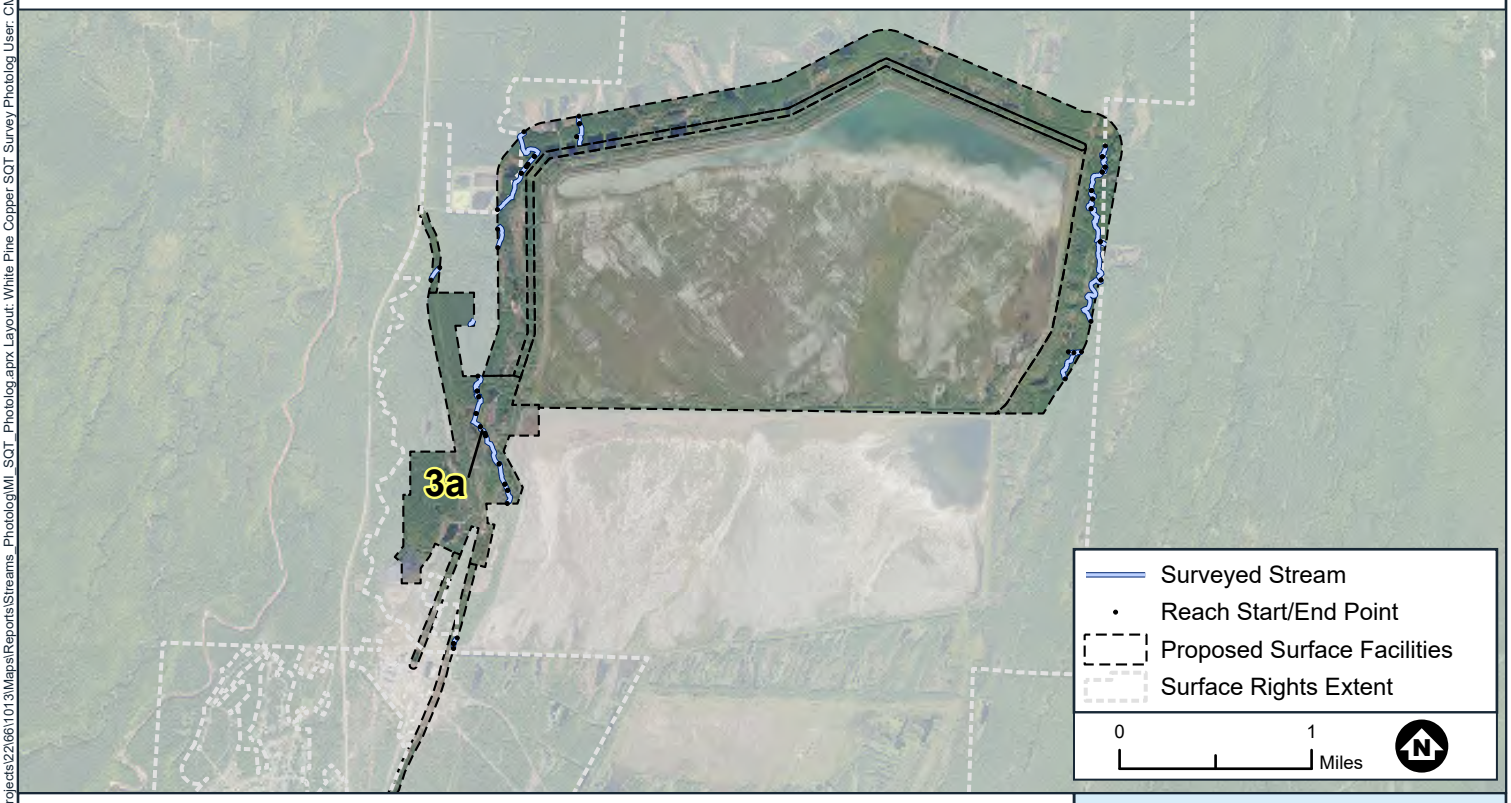
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Stream SQT Survey
Photo Log
White Pine North
White Pine Copper, LLC
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Reach: 3a

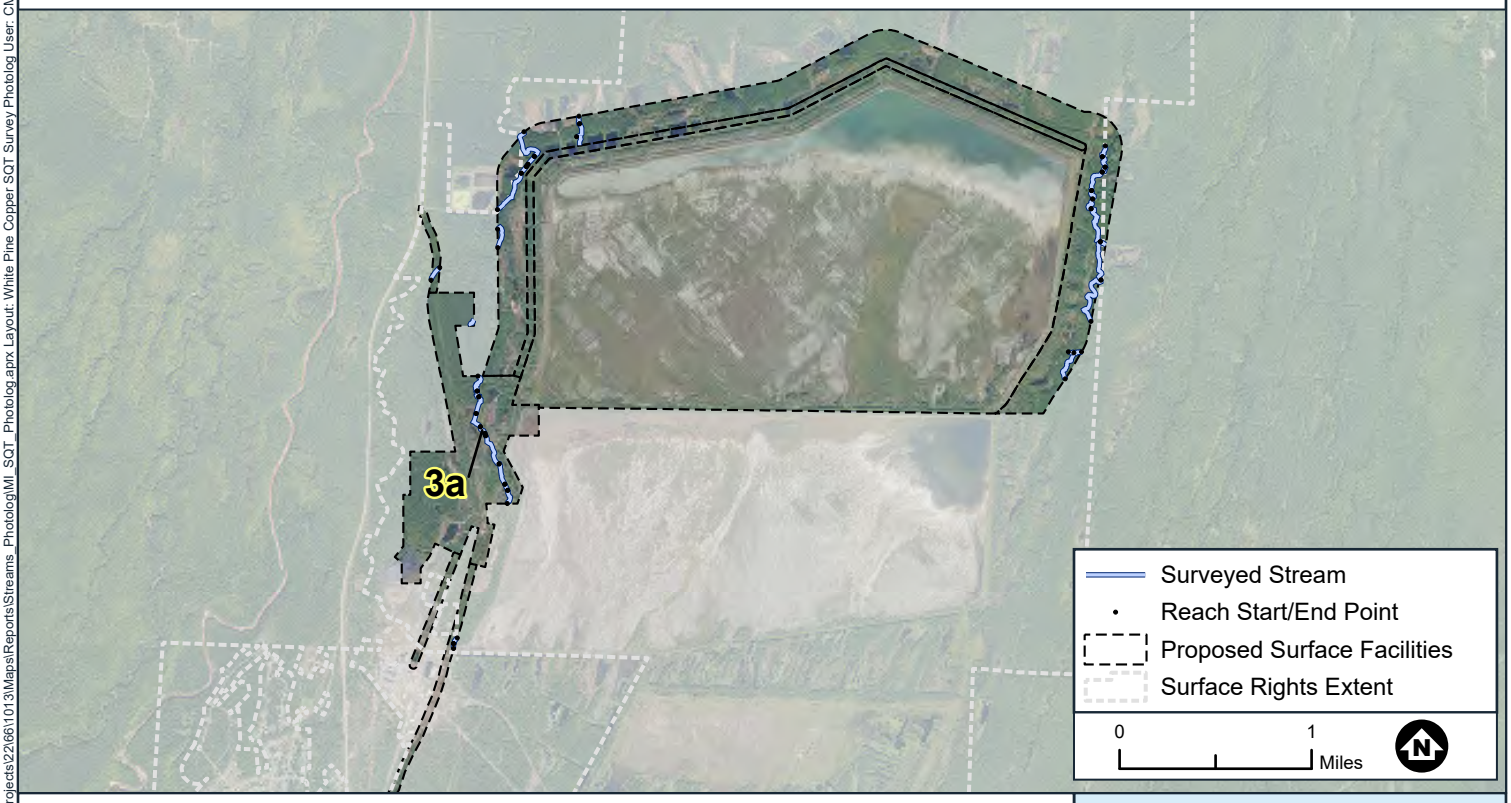
Photo caption: Start of Reach, Looking Downstream

Stream SQT Survey
Photo Log
White Pine North
White Pine Copper, LLC
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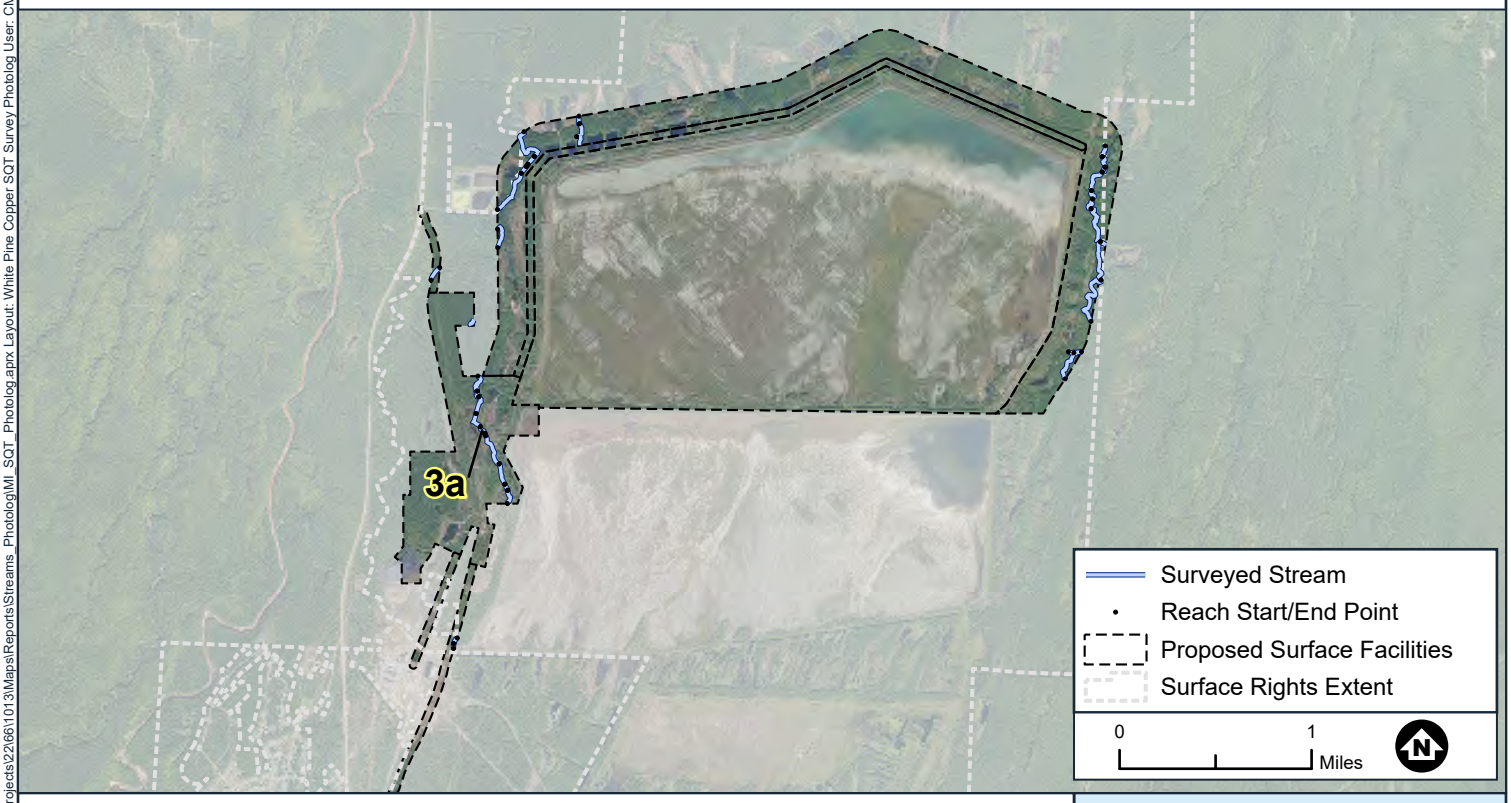
Photo caption: Representative Riffle Cross Section

Stream SQT Survey
Photo Log
White Pine North
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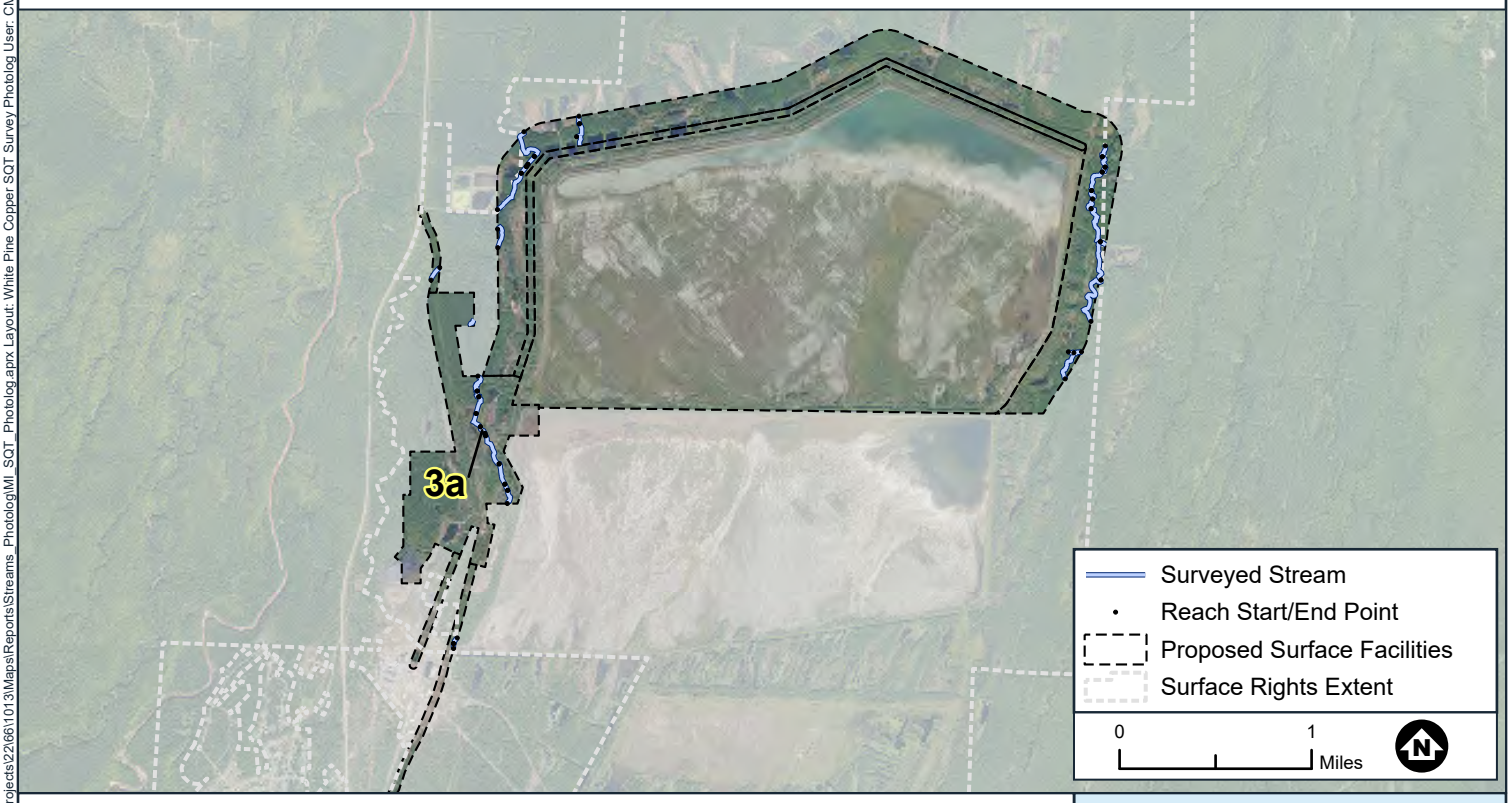
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Stream SQT Survey
Photo Log
White Pine North
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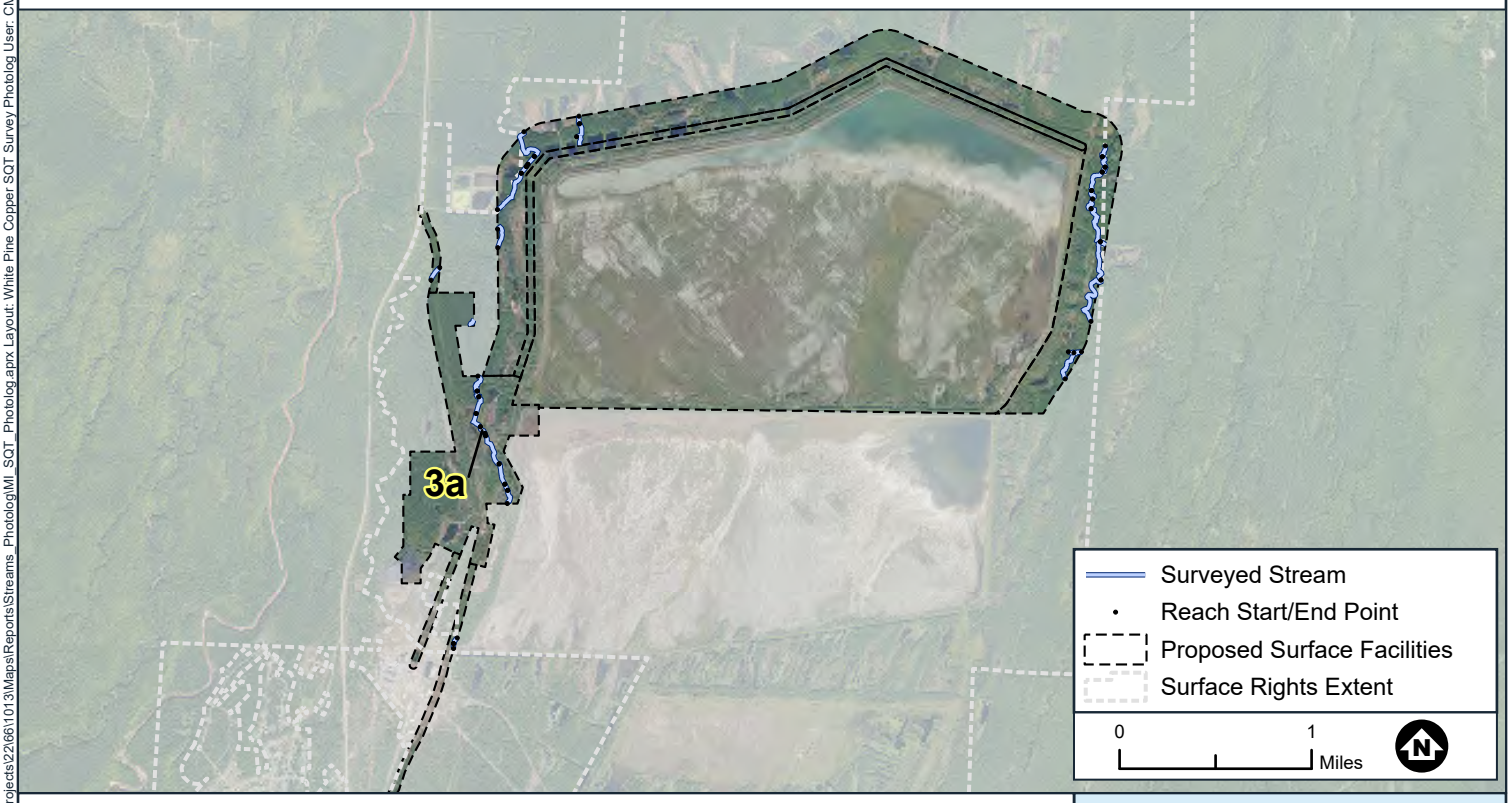
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Stream SQT Survey
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White Pine North
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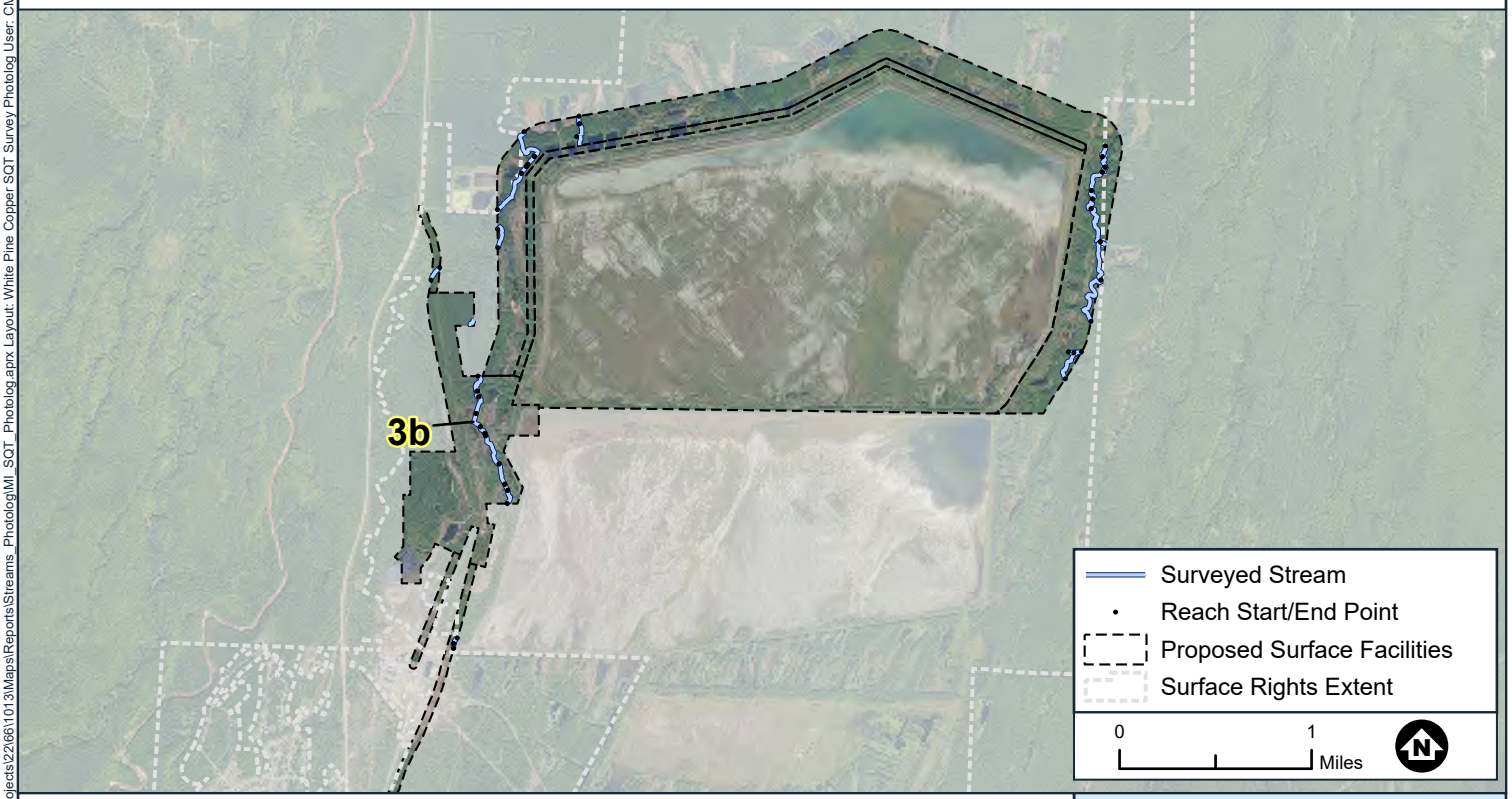
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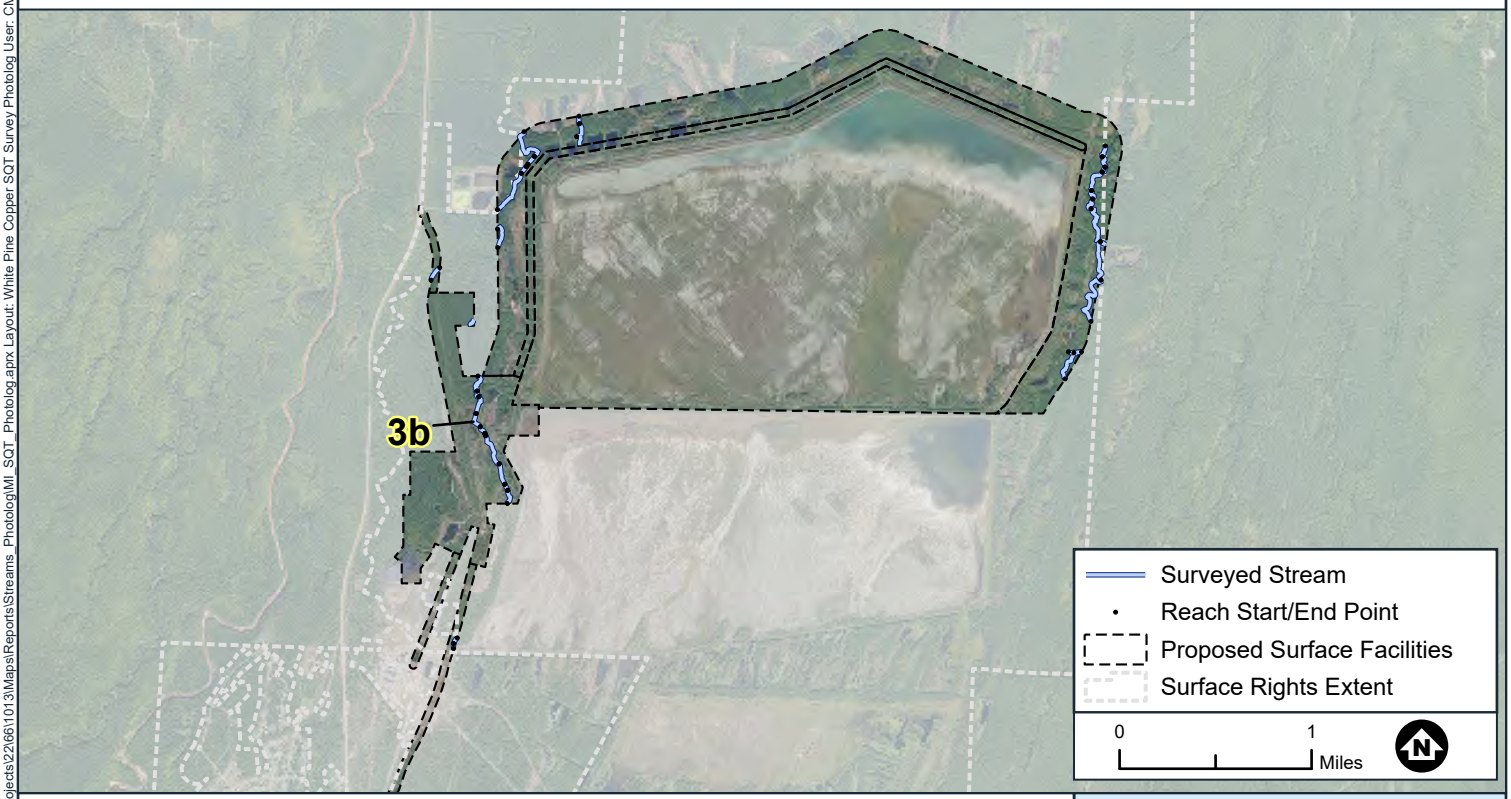
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Stream SQT Survey
Photo Log
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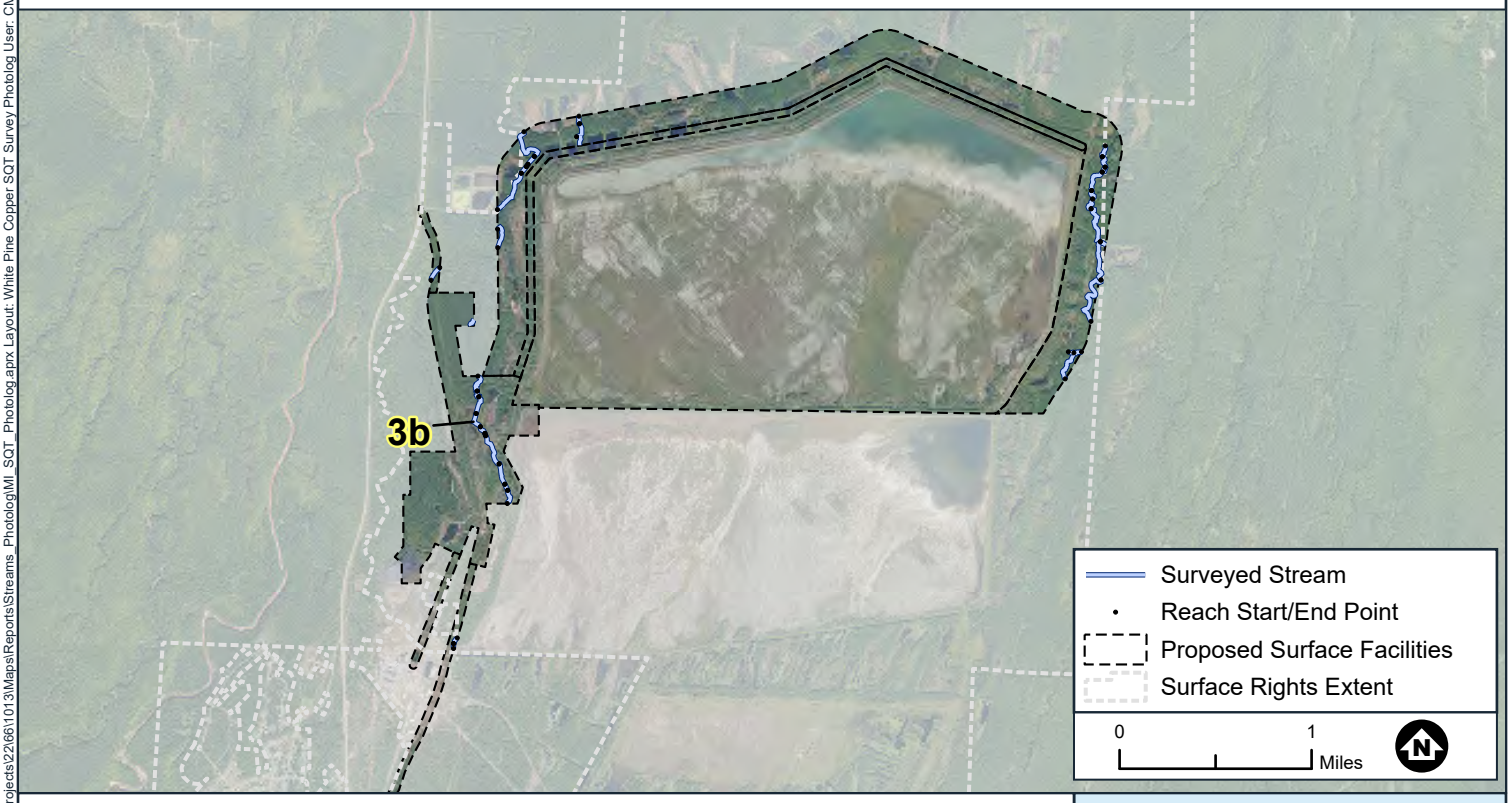
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Stream SQT Survey
Photo Log
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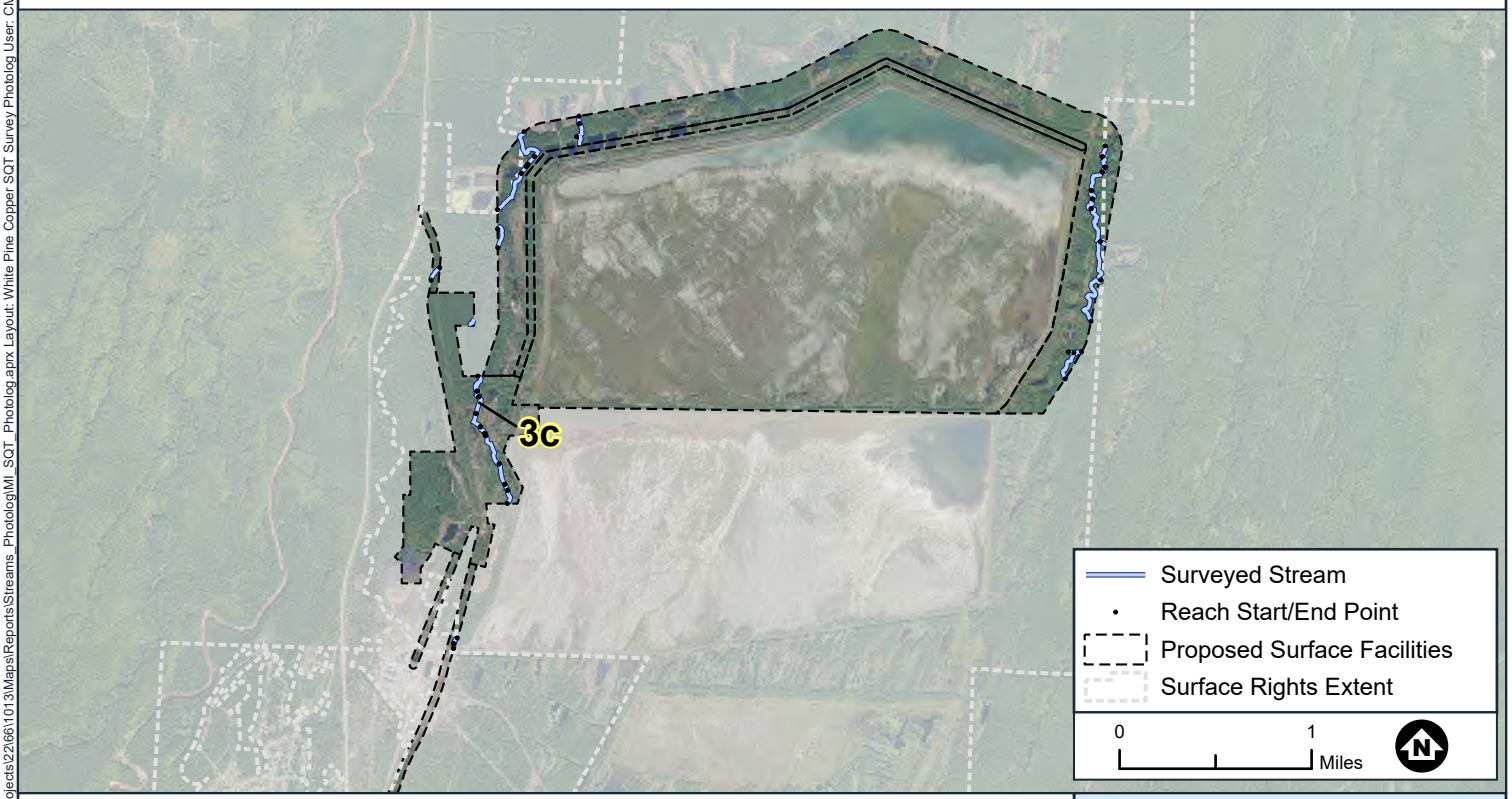
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Stream SQT Survey
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Reach: 3c

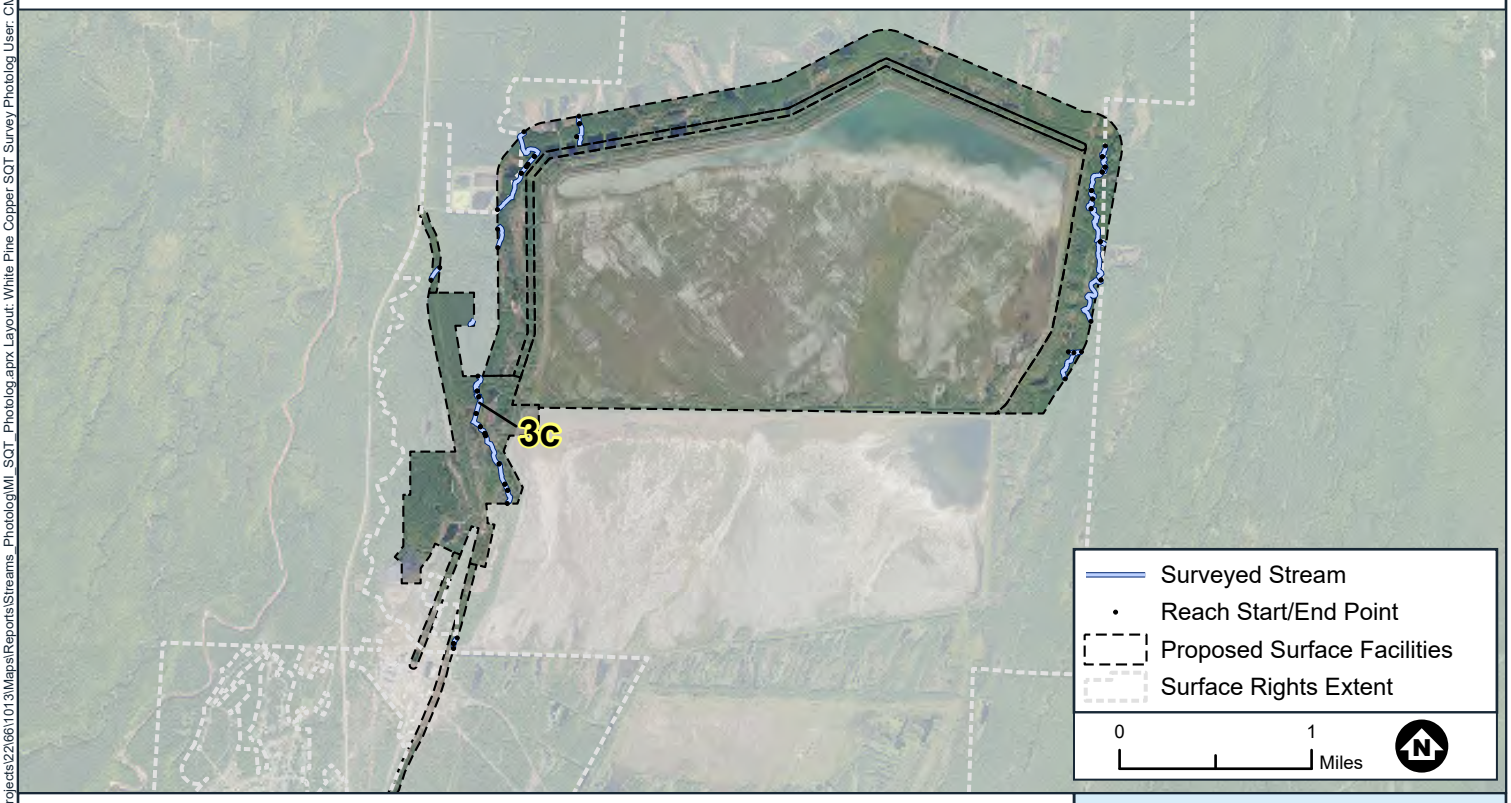
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Stream SQT Survey
Photo Log
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Bar Footer: ArcGISPro 3.4, 2025-01-06 15:55 File: I:\Projects\23166\1013\Maps\Reports\Streams_Photolog\MI_SQT_Photolog.aprx Layout: White Pine Copper SQT Survey Photolog User: CML3





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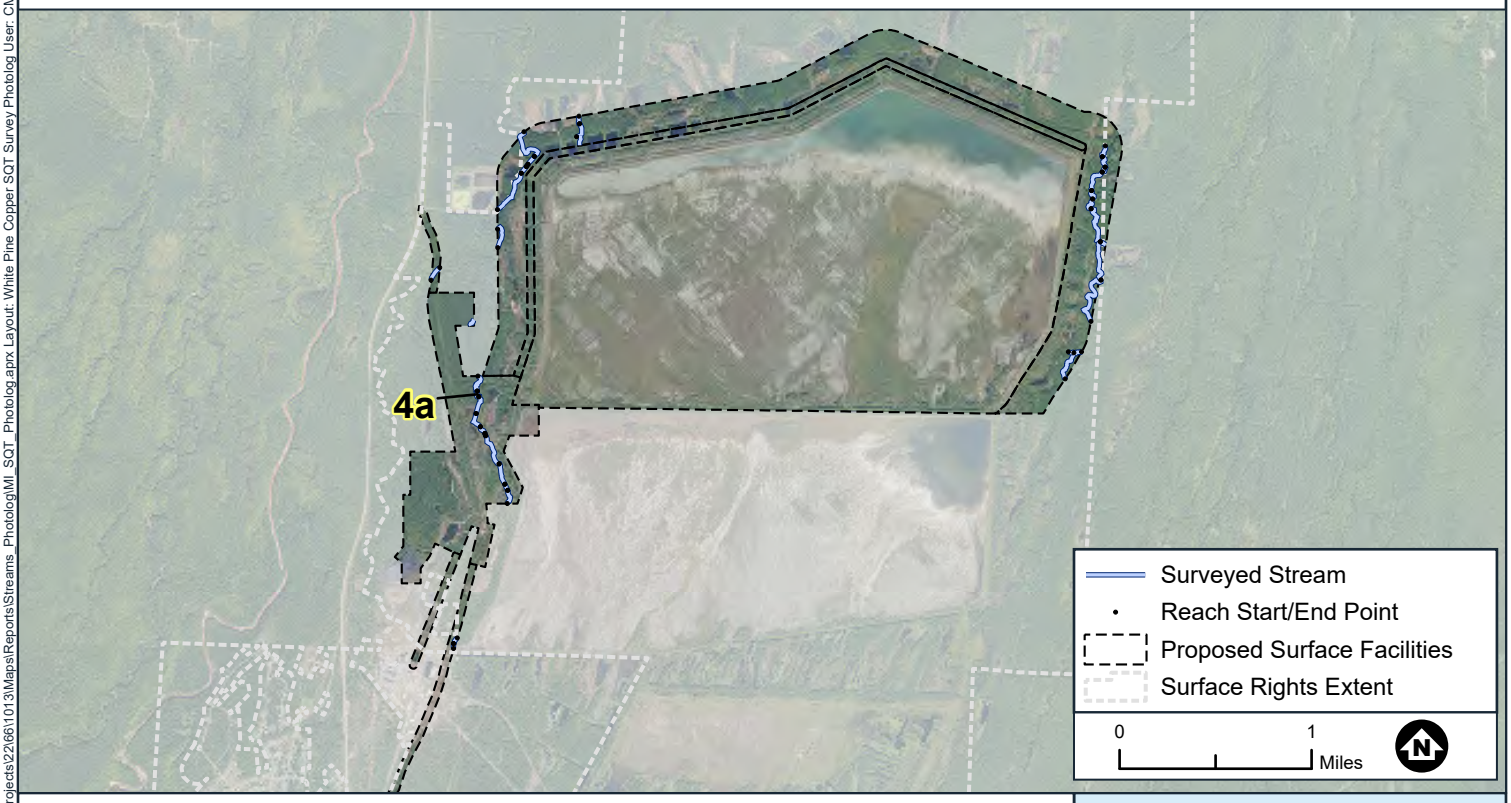
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Ontonagon County, Michigan

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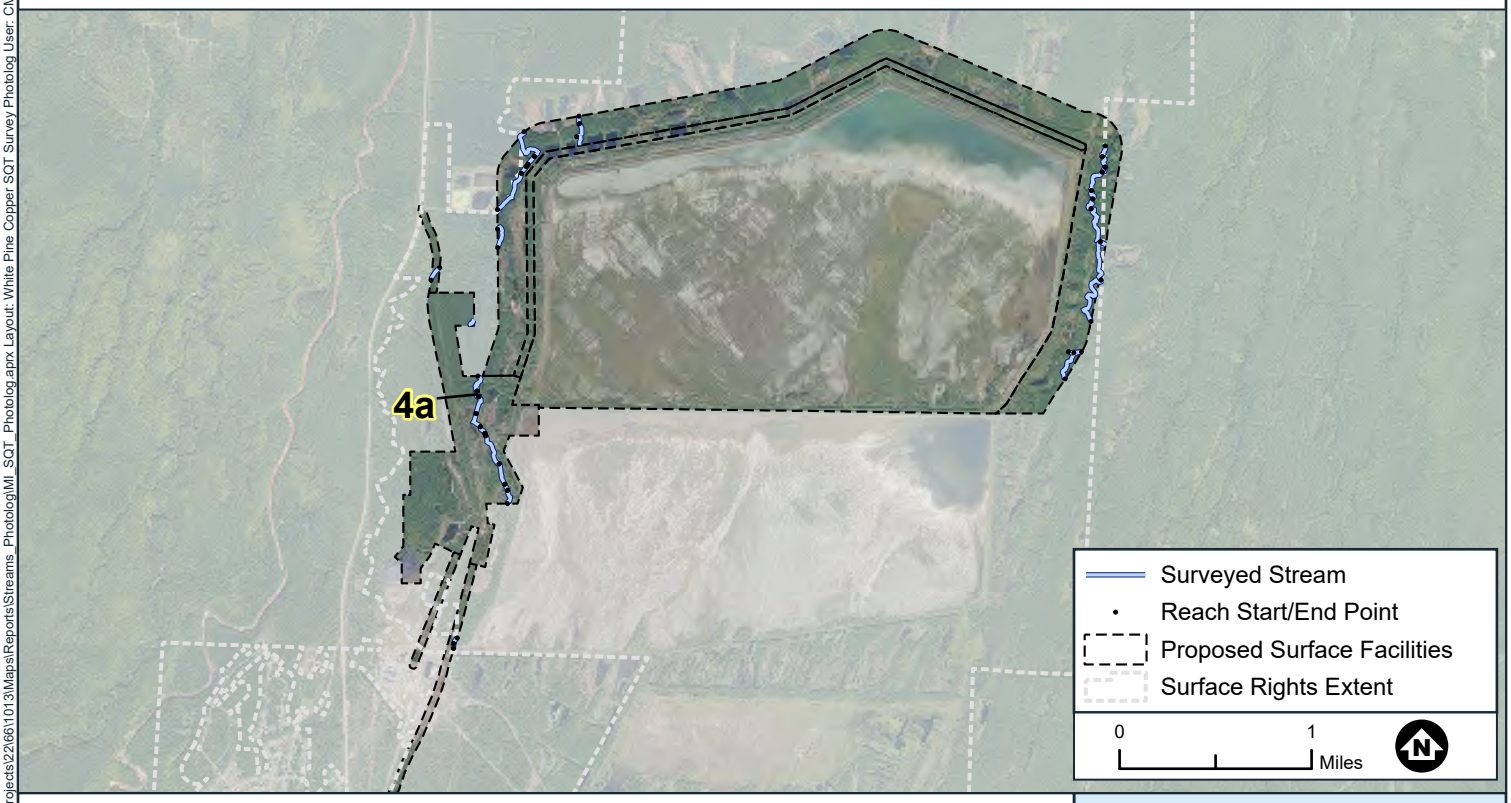
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Stream SQT Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Barr Footer: ArcGISPro 3.4, 2025-01-06 15:55 File: I:\Projects\23166\1013\Maps\Reports\Streams_Photolog\MI_SQT_Photolog.aprx Layout: White Pine Copper SQT Survey Photolog User: CML3





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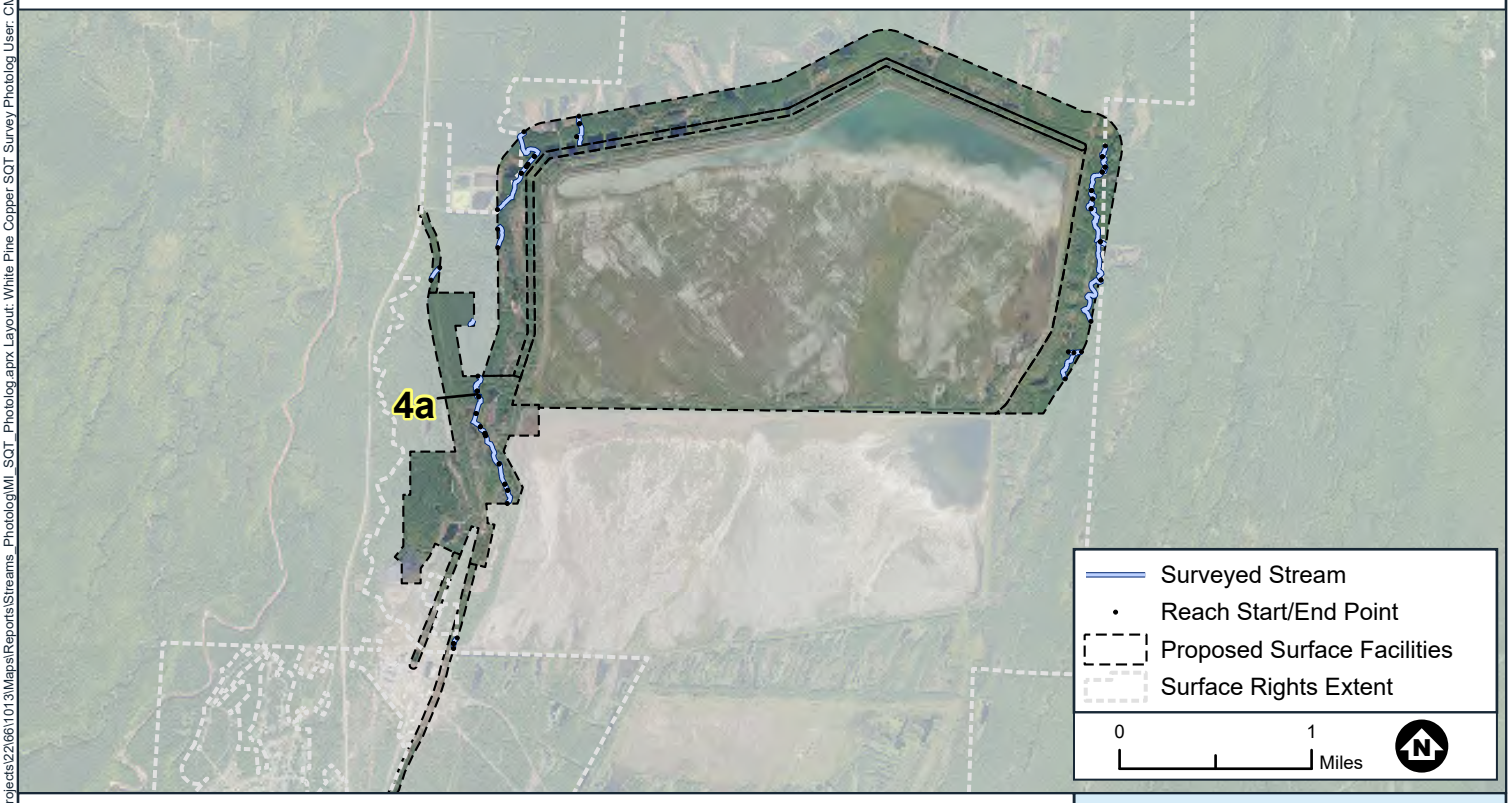
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Stream SQT Survey
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White Pine North
White Pine Copper, LLC
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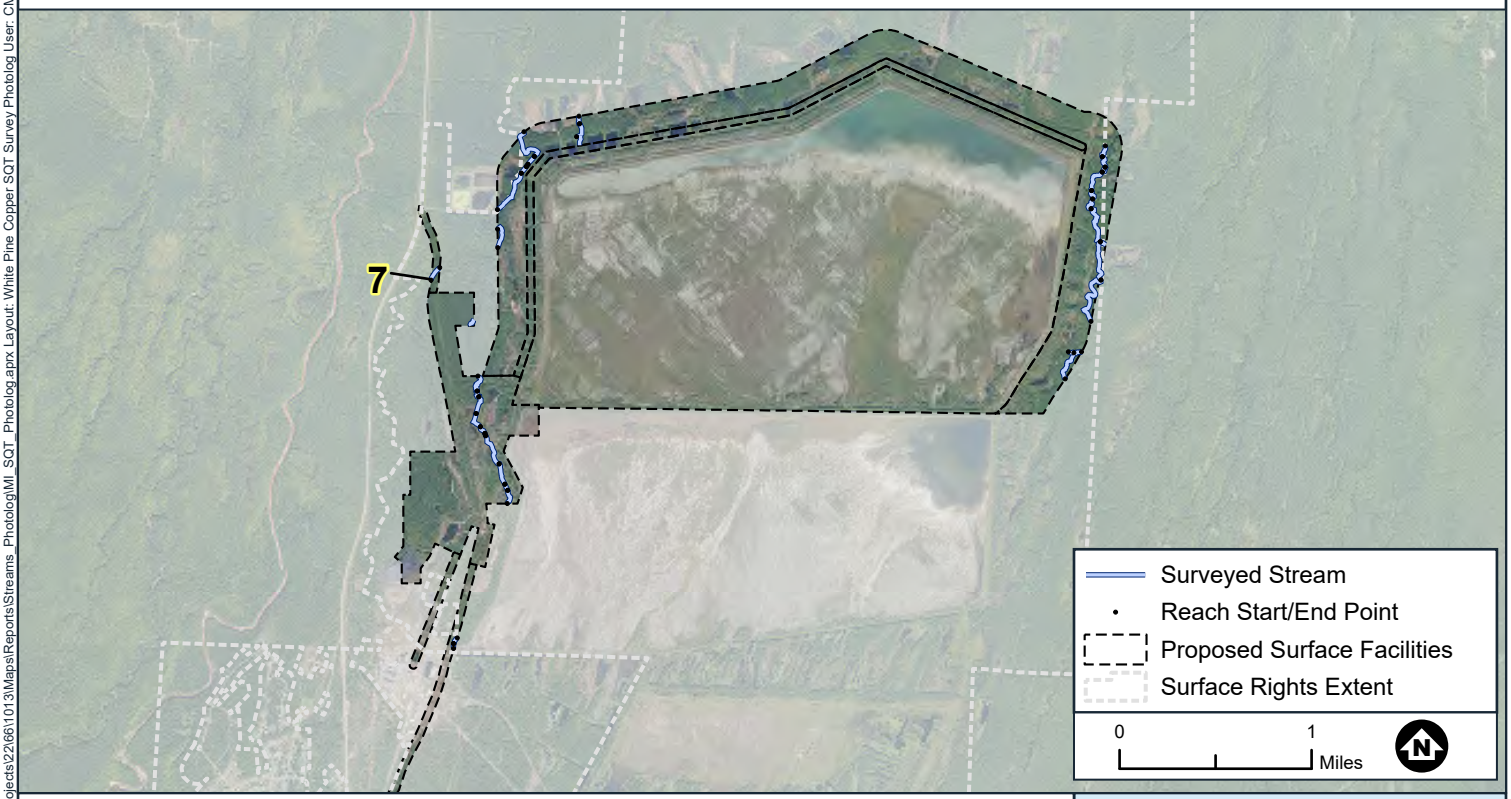
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Stream SQT Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
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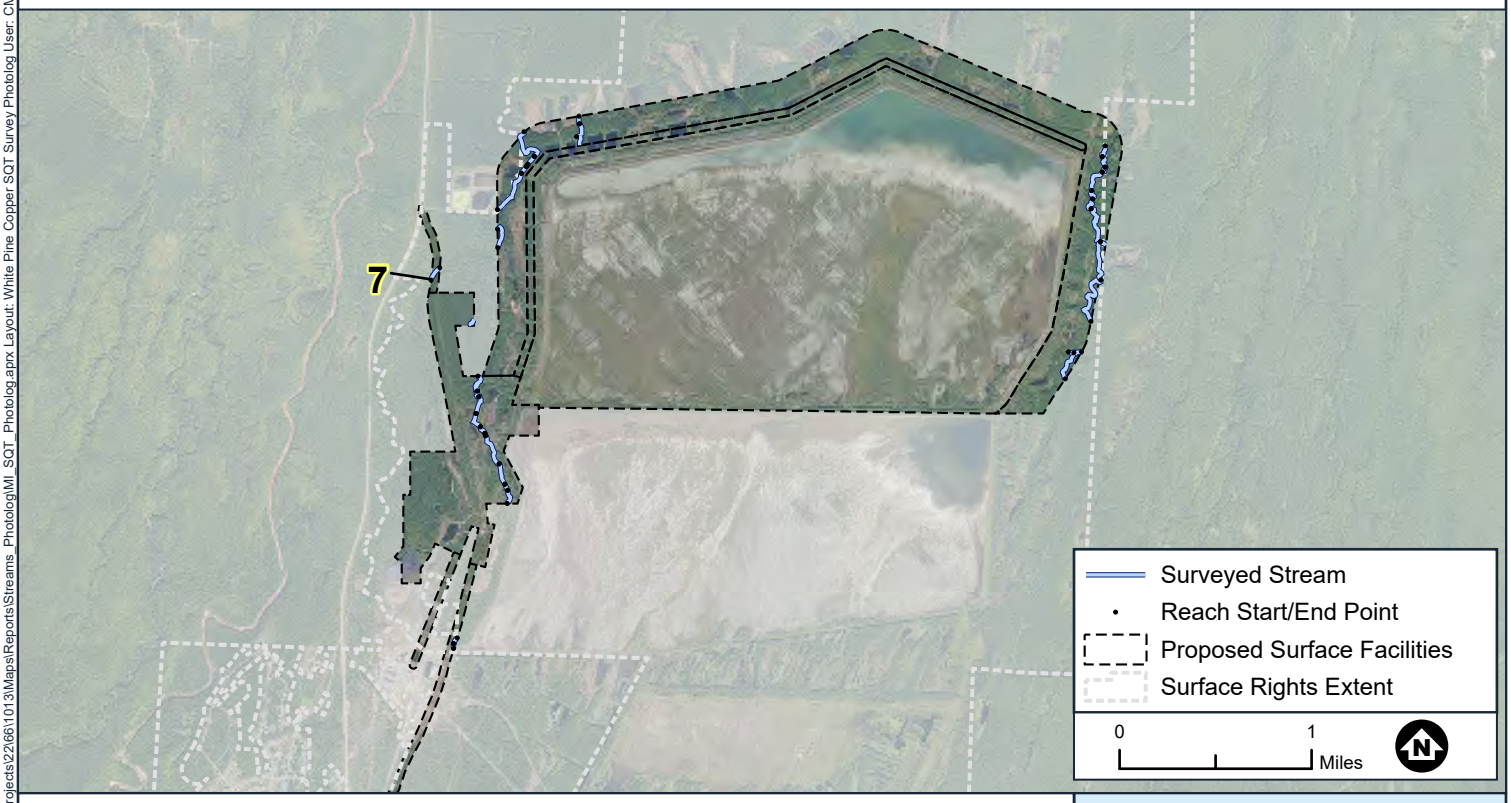
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Stream SQT Survey
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White Pine North
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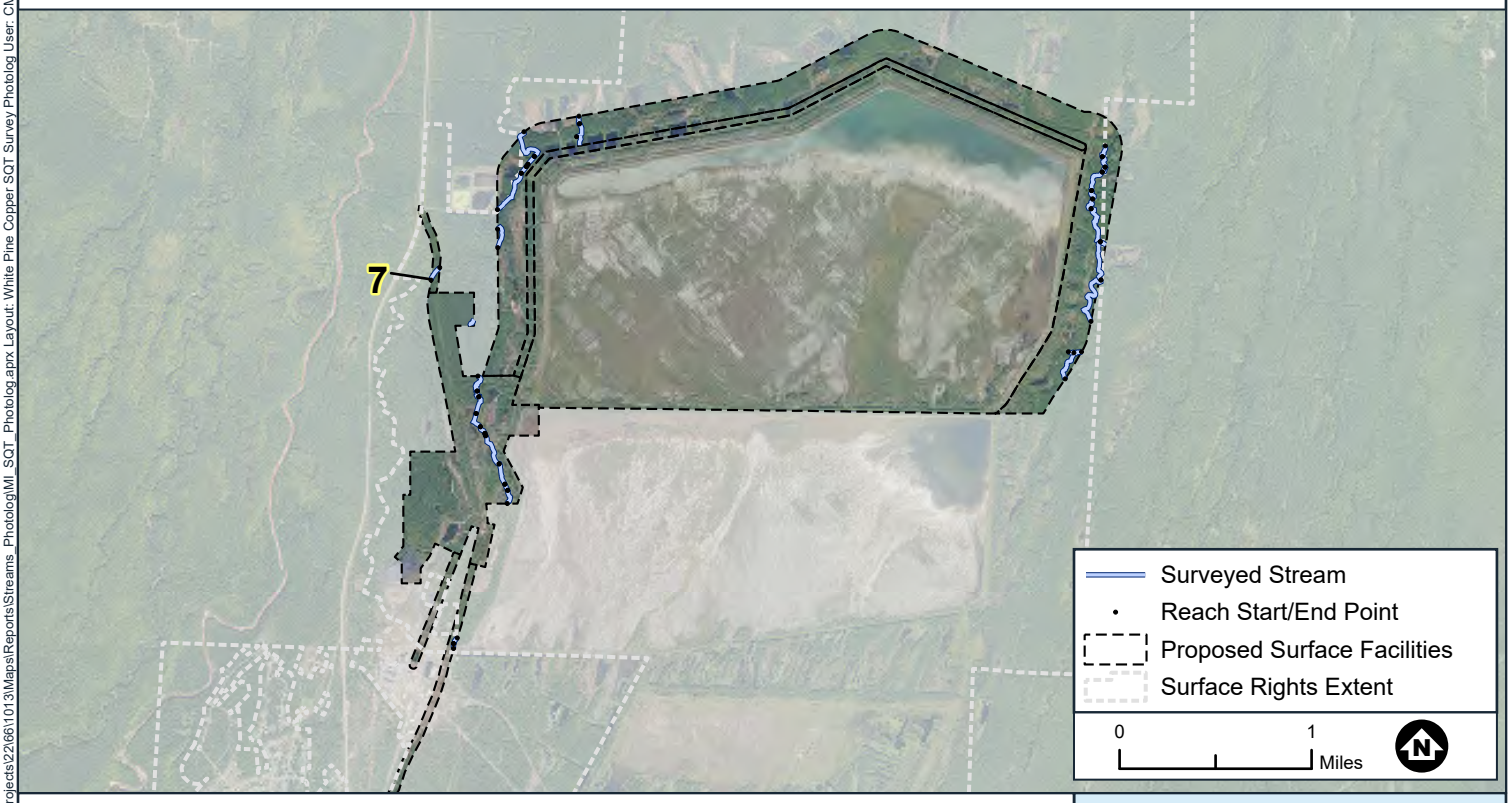
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Stream SQT Survey
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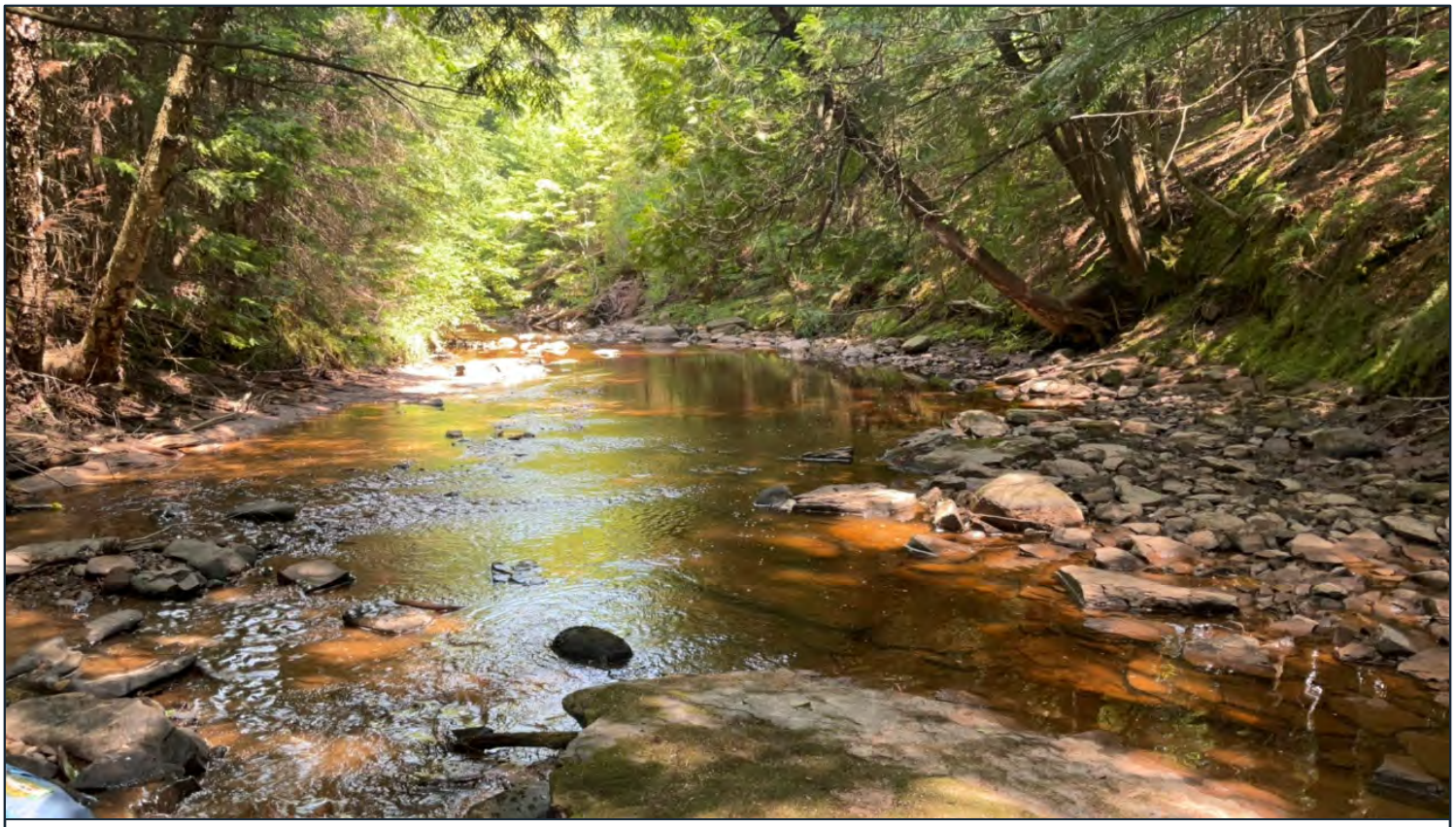
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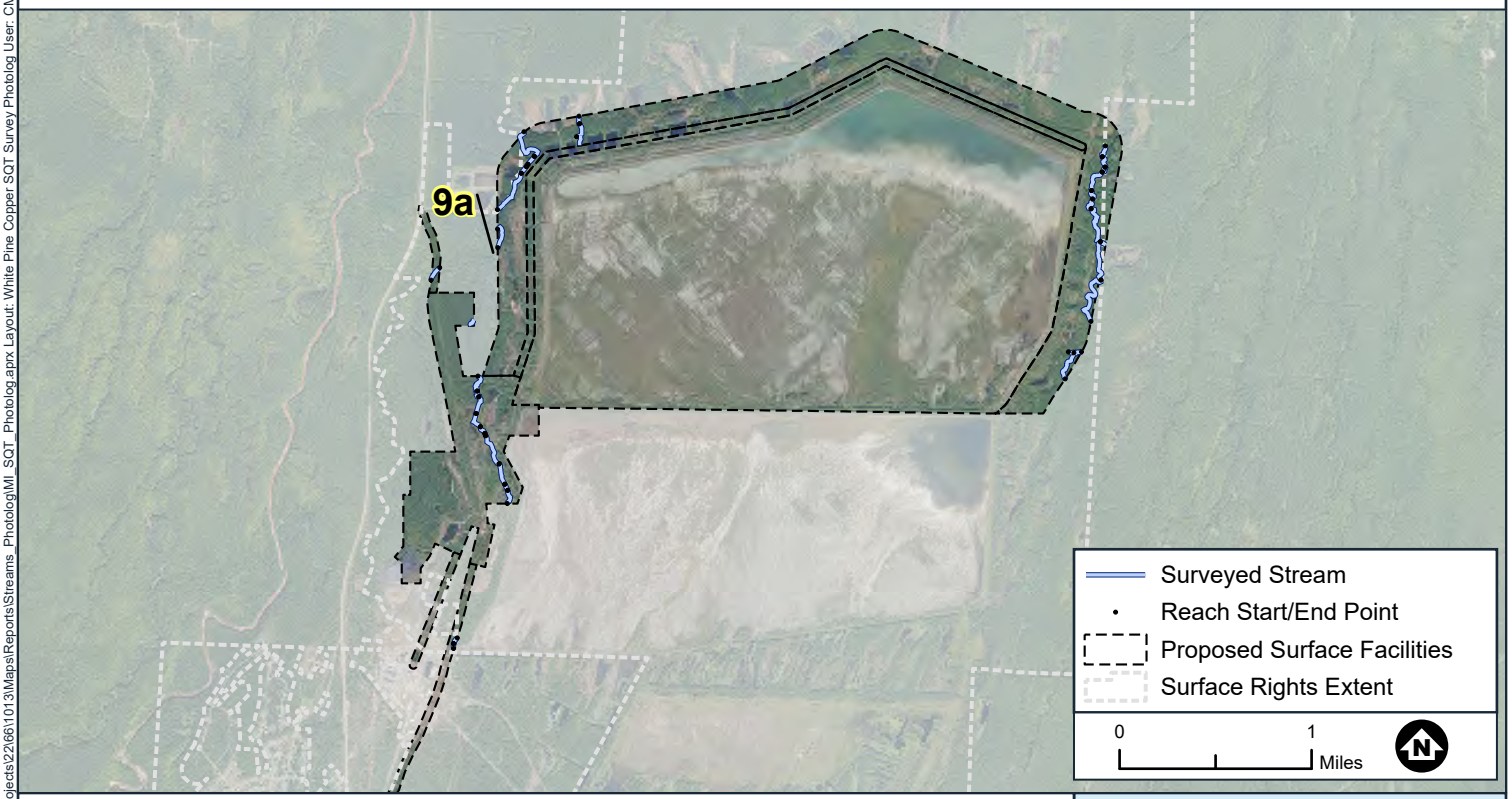
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Stream SQT Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
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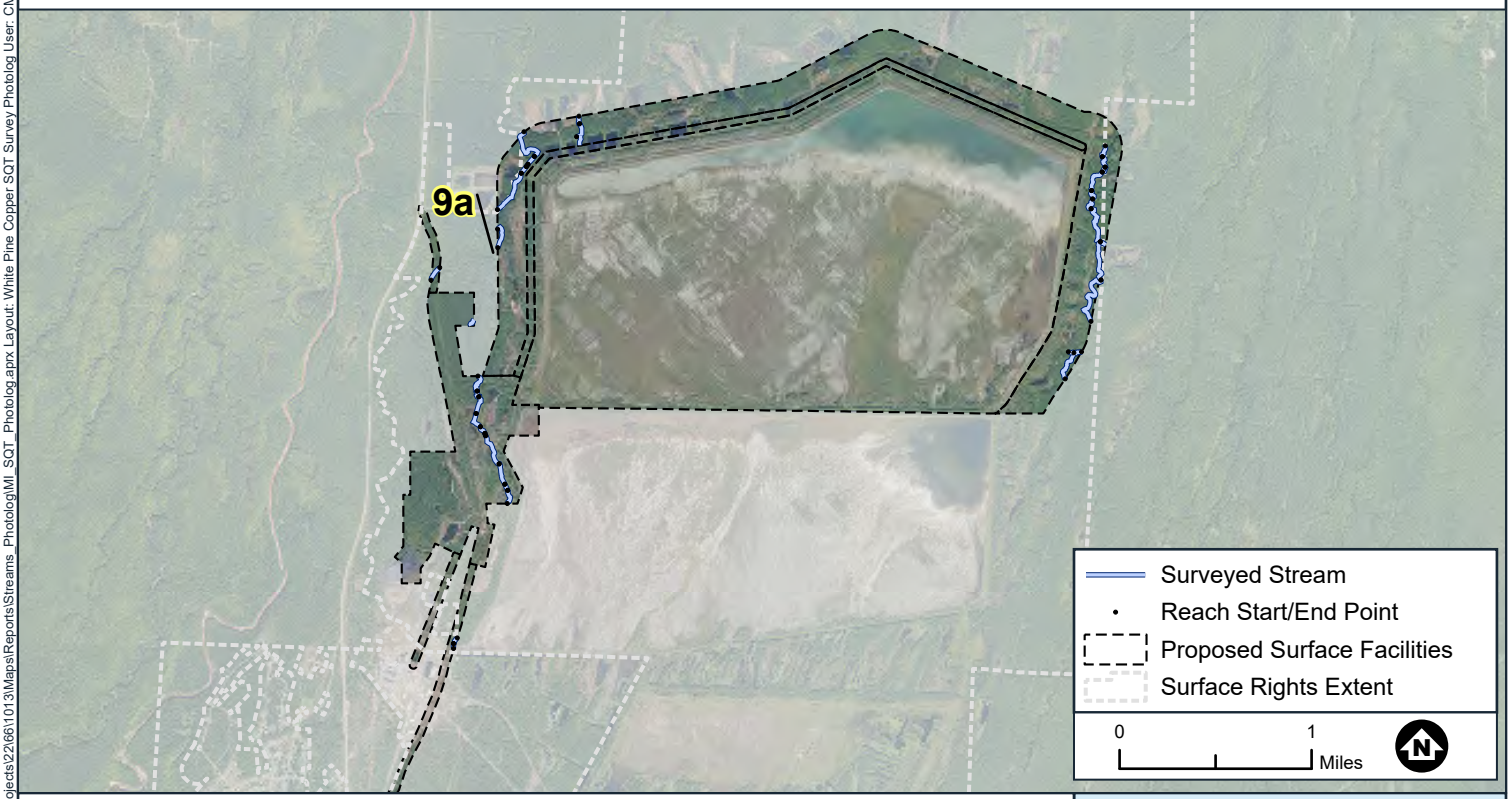
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Stream SQT Survey
Photo Log
White Pine North
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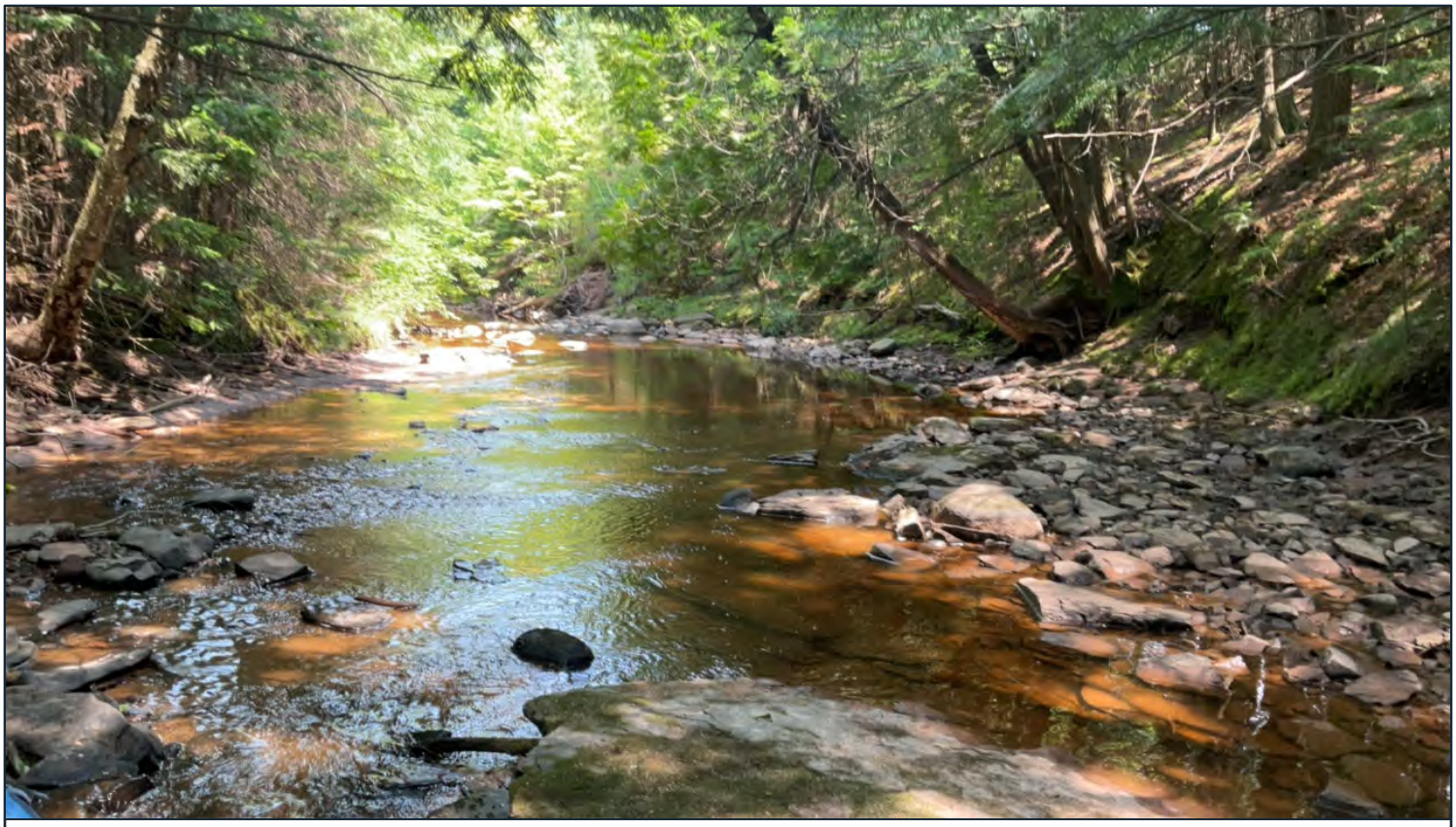
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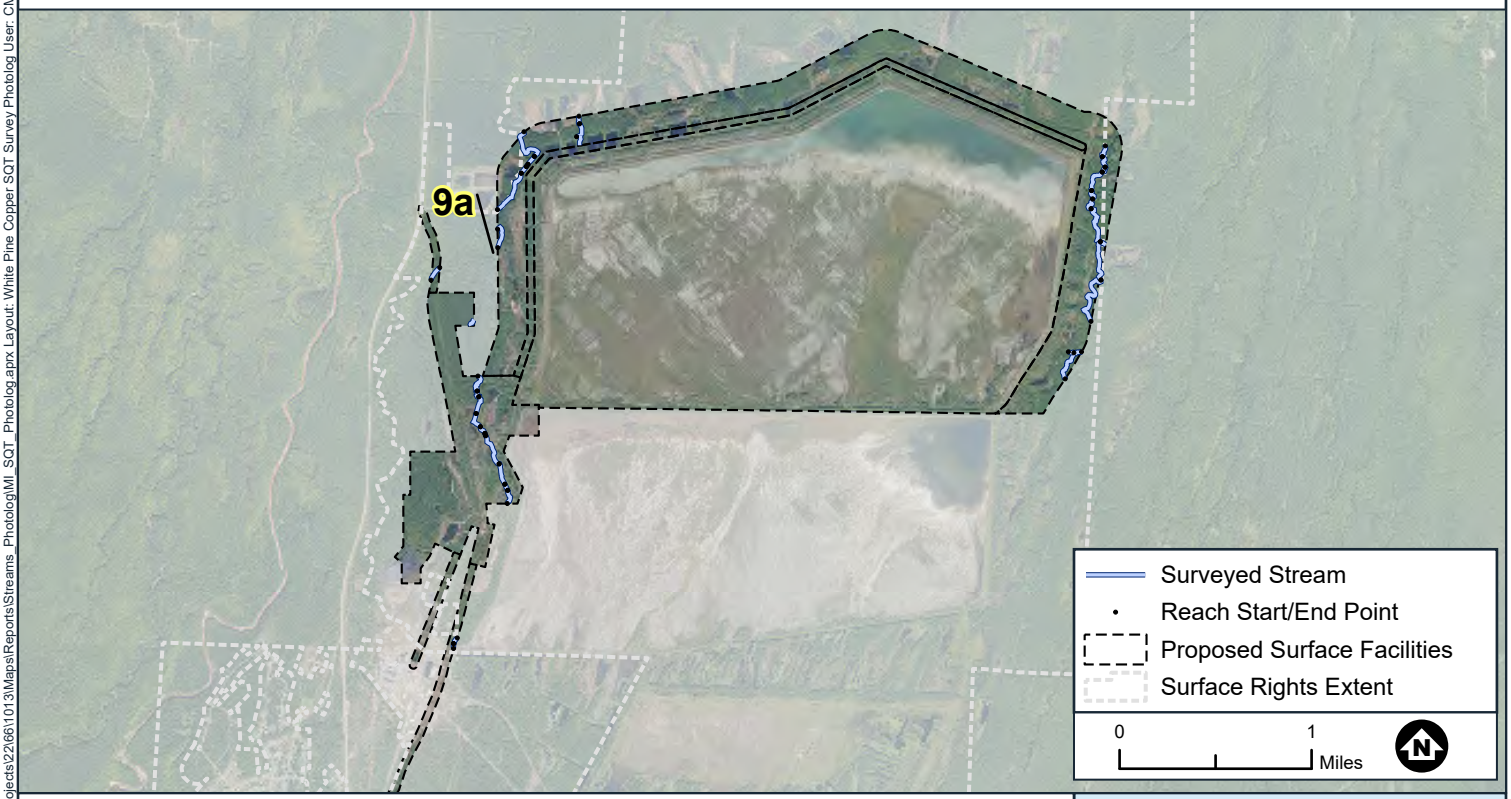
Photo caption: Representative Riffle Cross Section

Stream SQT Survey
Photo Log
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White Pine Copper, LLC
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Ontonagon County, Michigan

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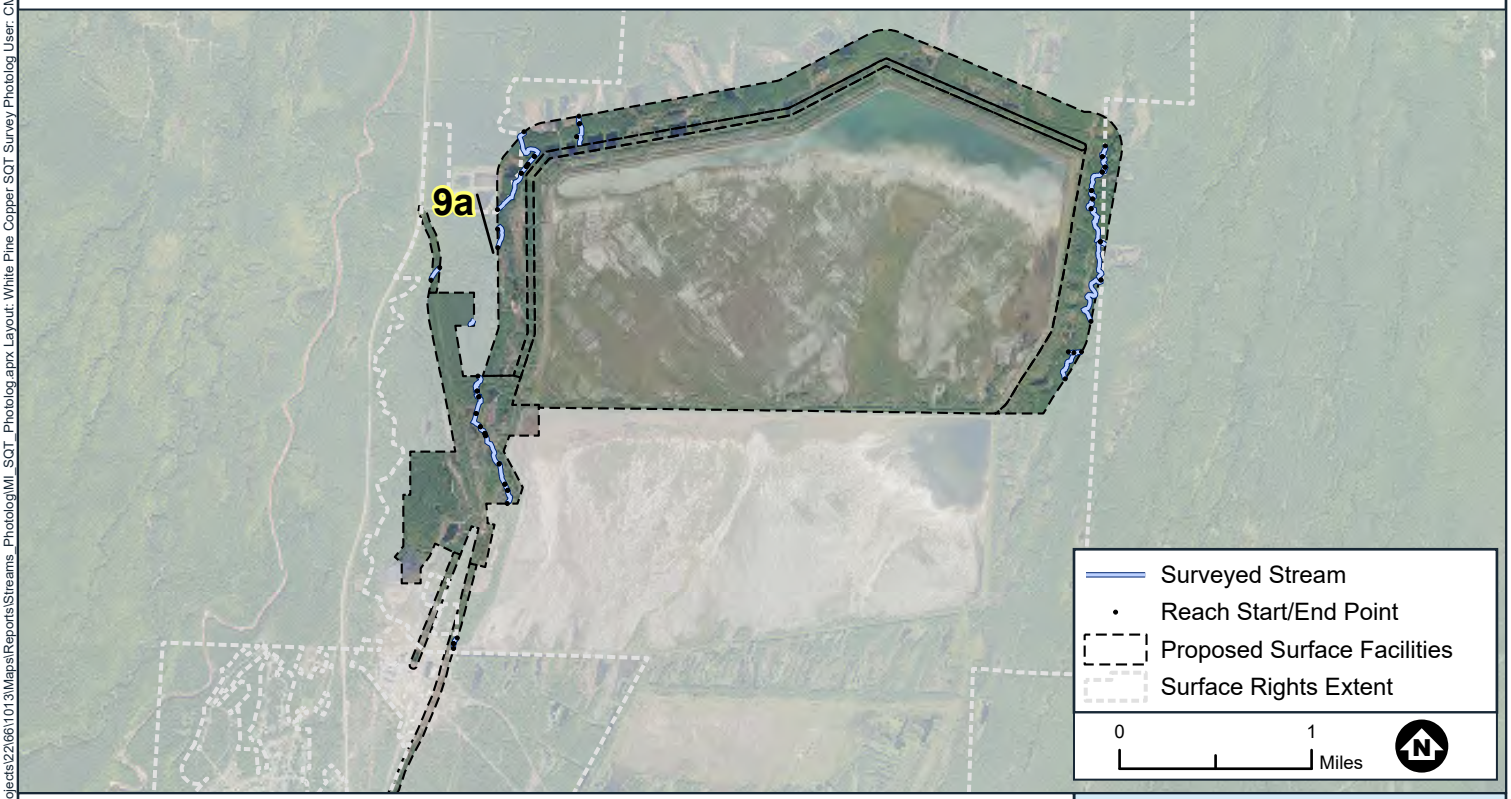
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Stream SQT Survey
Photo Log
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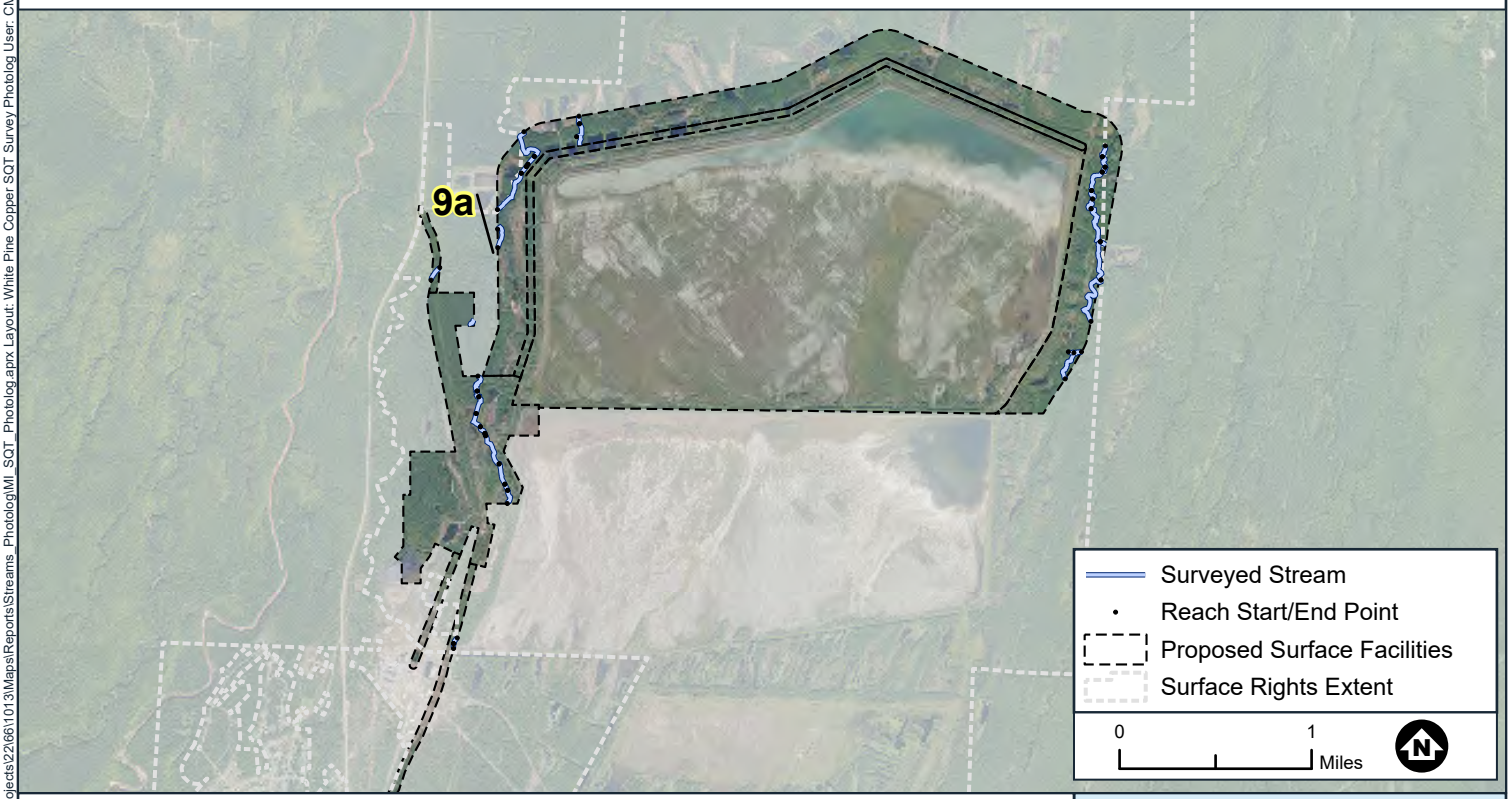
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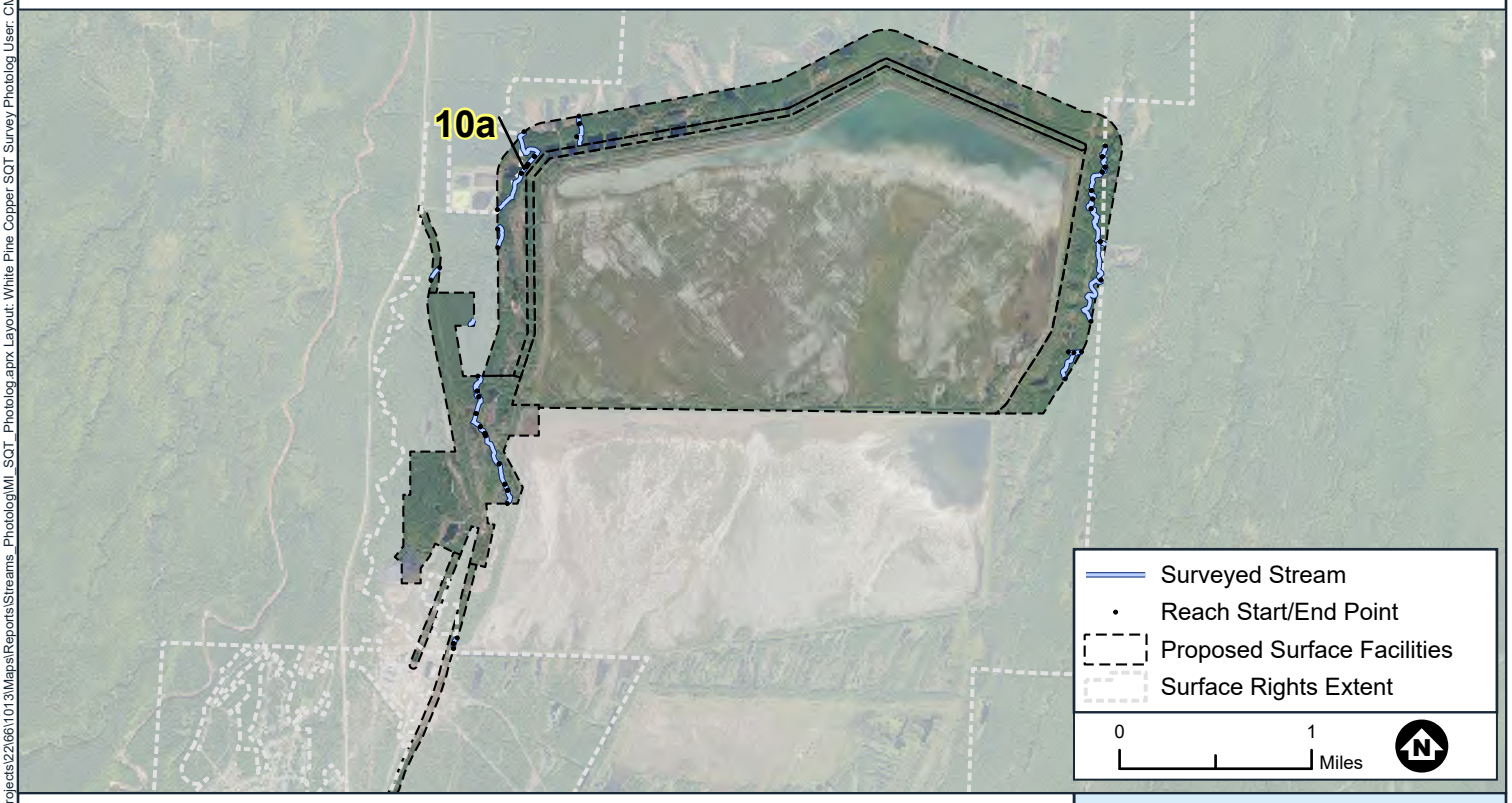
Photo caption: Streambank Assessed for Erosion

Stream SQT Survey
Photo Log
White Pine North
White Pine Copper, LLC
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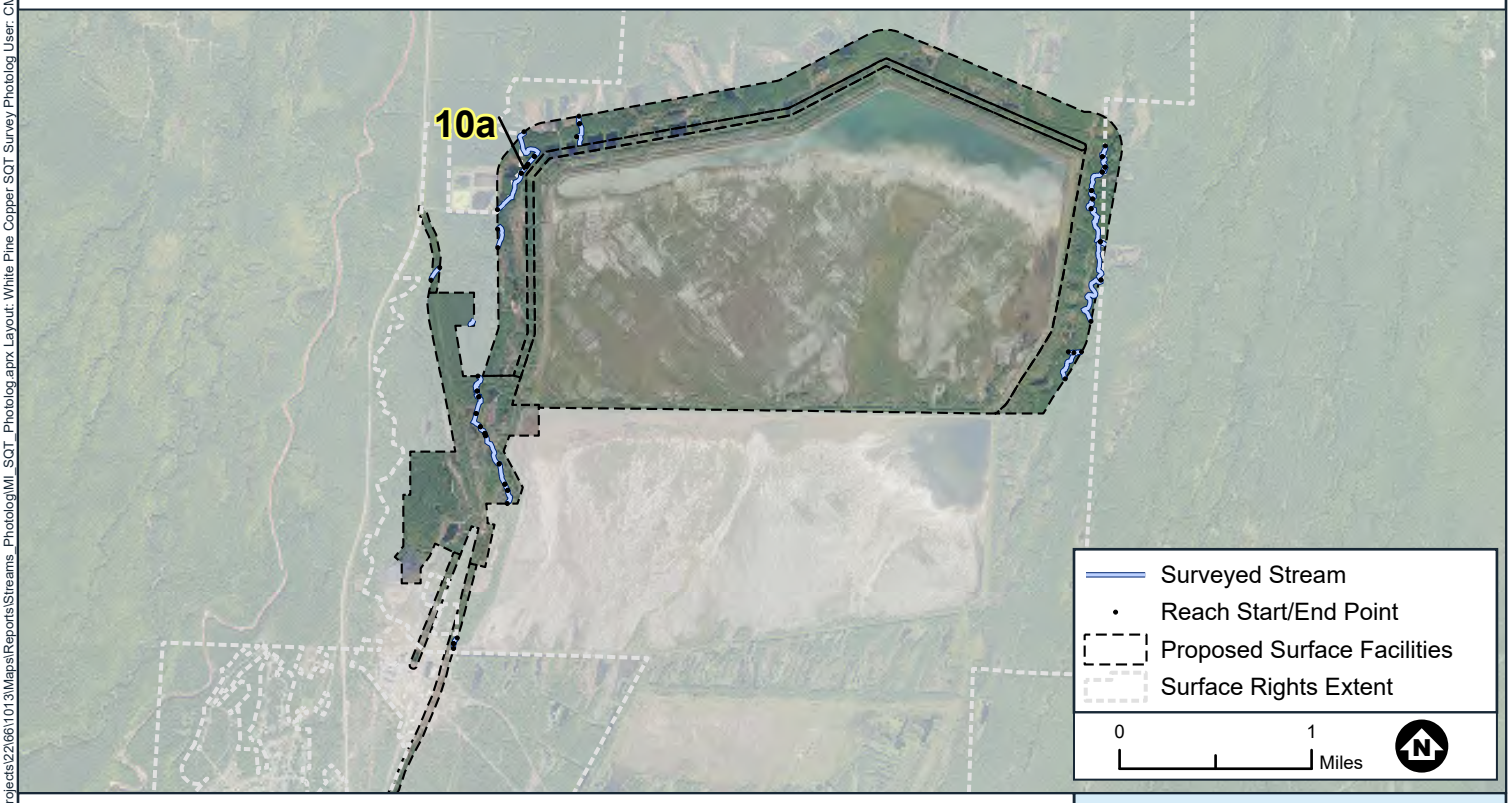
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Stream SQT Survey
Photo Log
White Pine North
White Pine Copper, LLC
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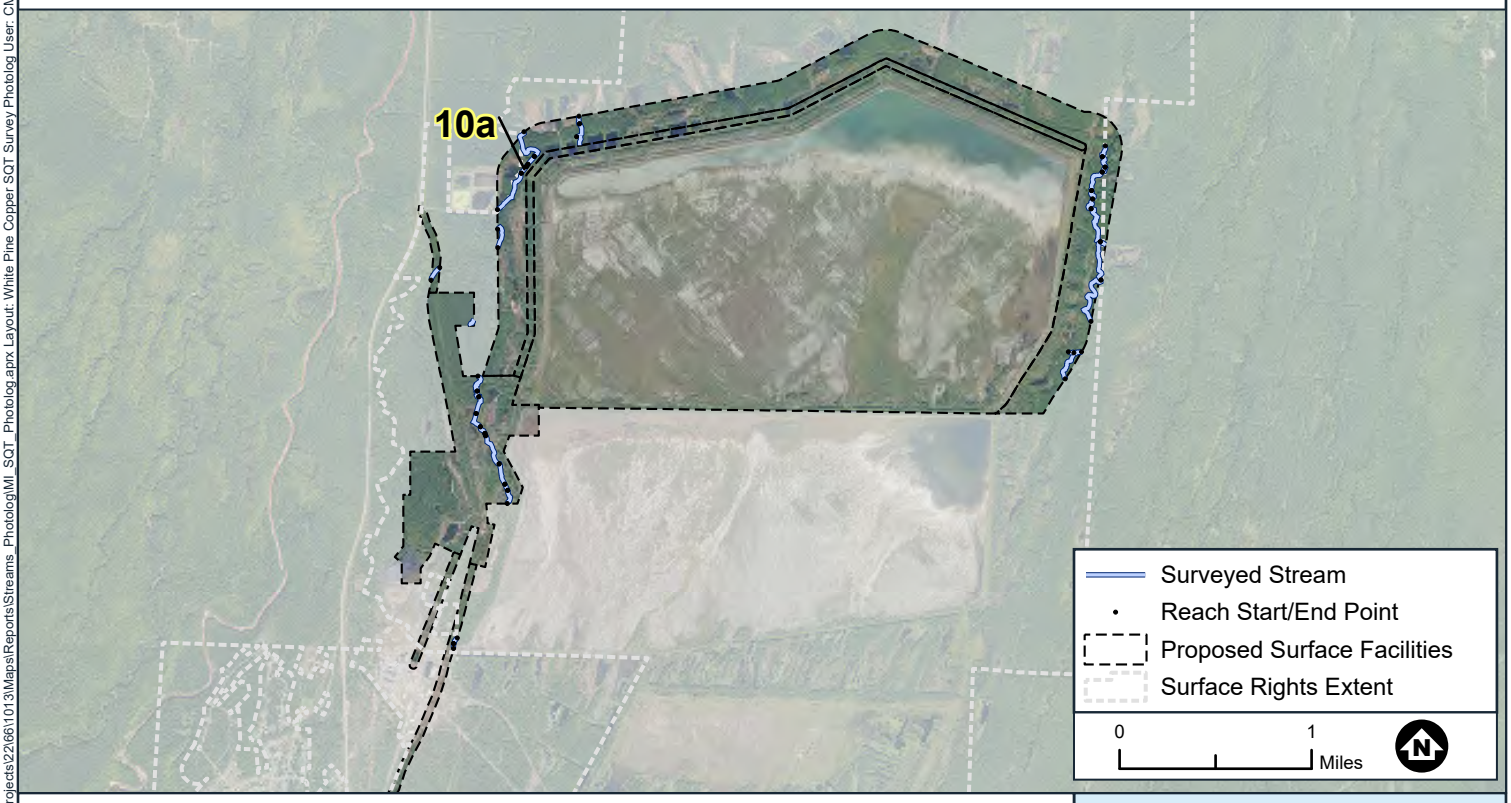
Photo caption: Representative Riffle Cross Section

Stream SQT Survey
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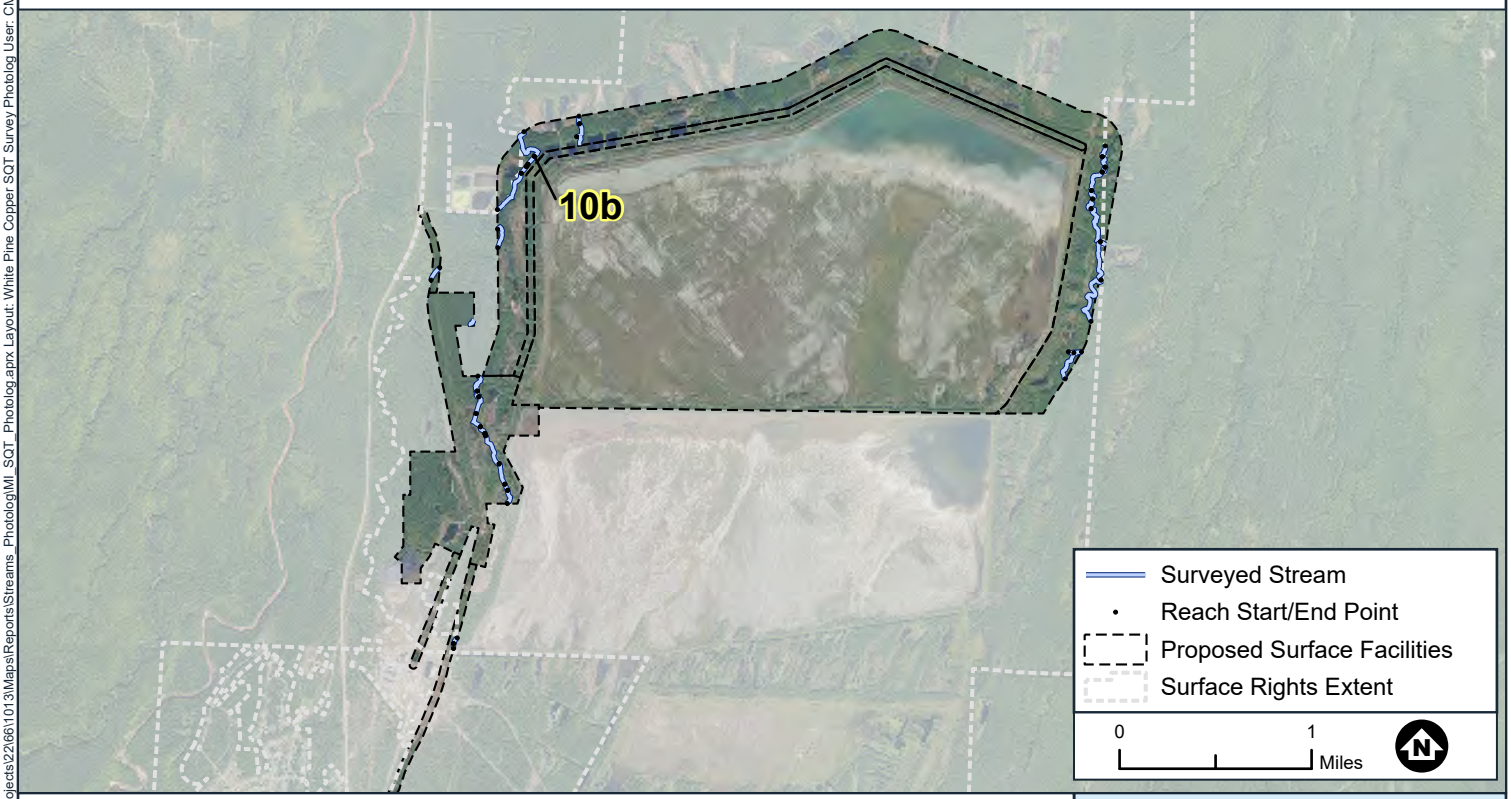
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Stream SQT Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

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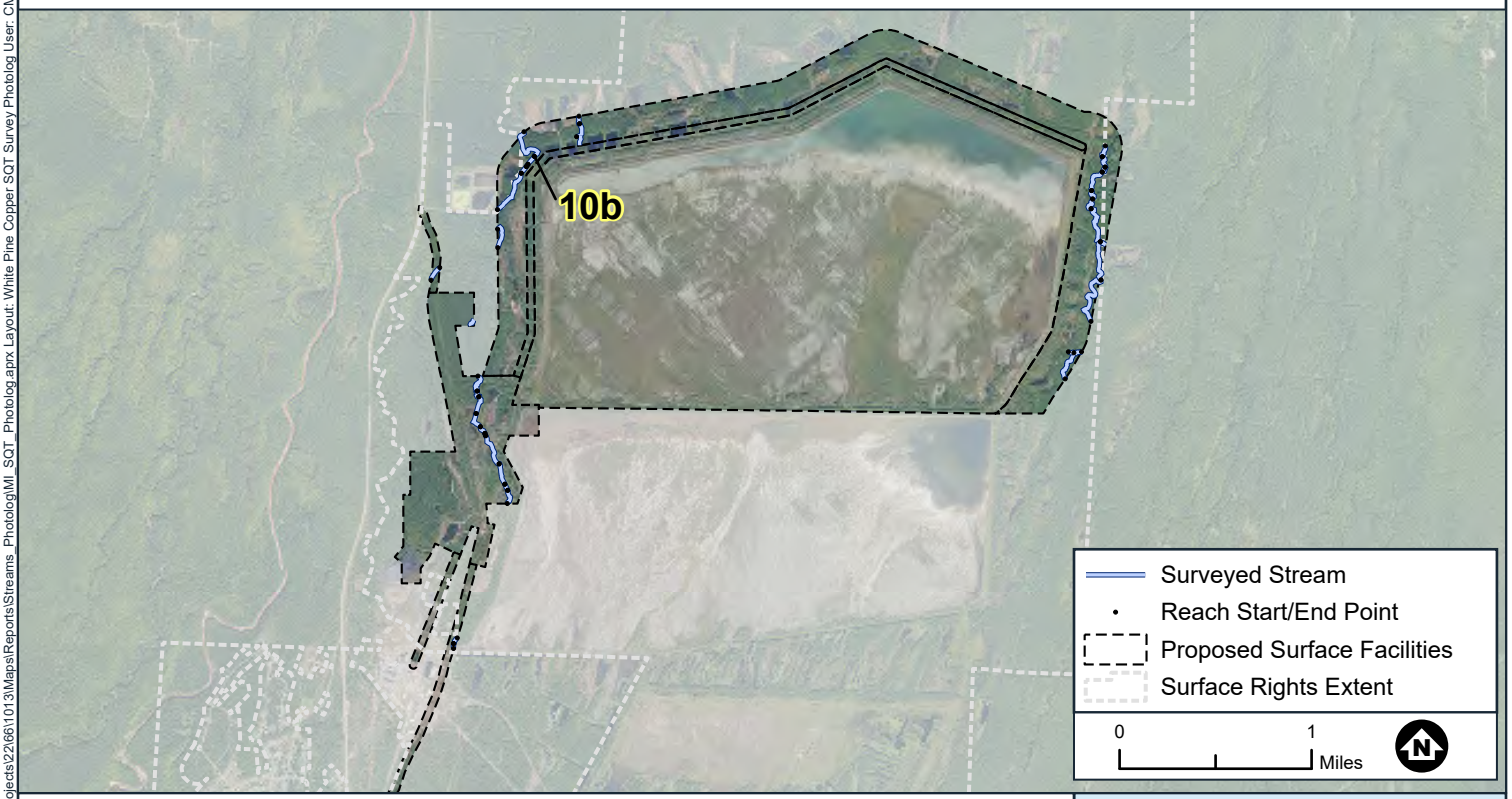
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Stream SQT Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
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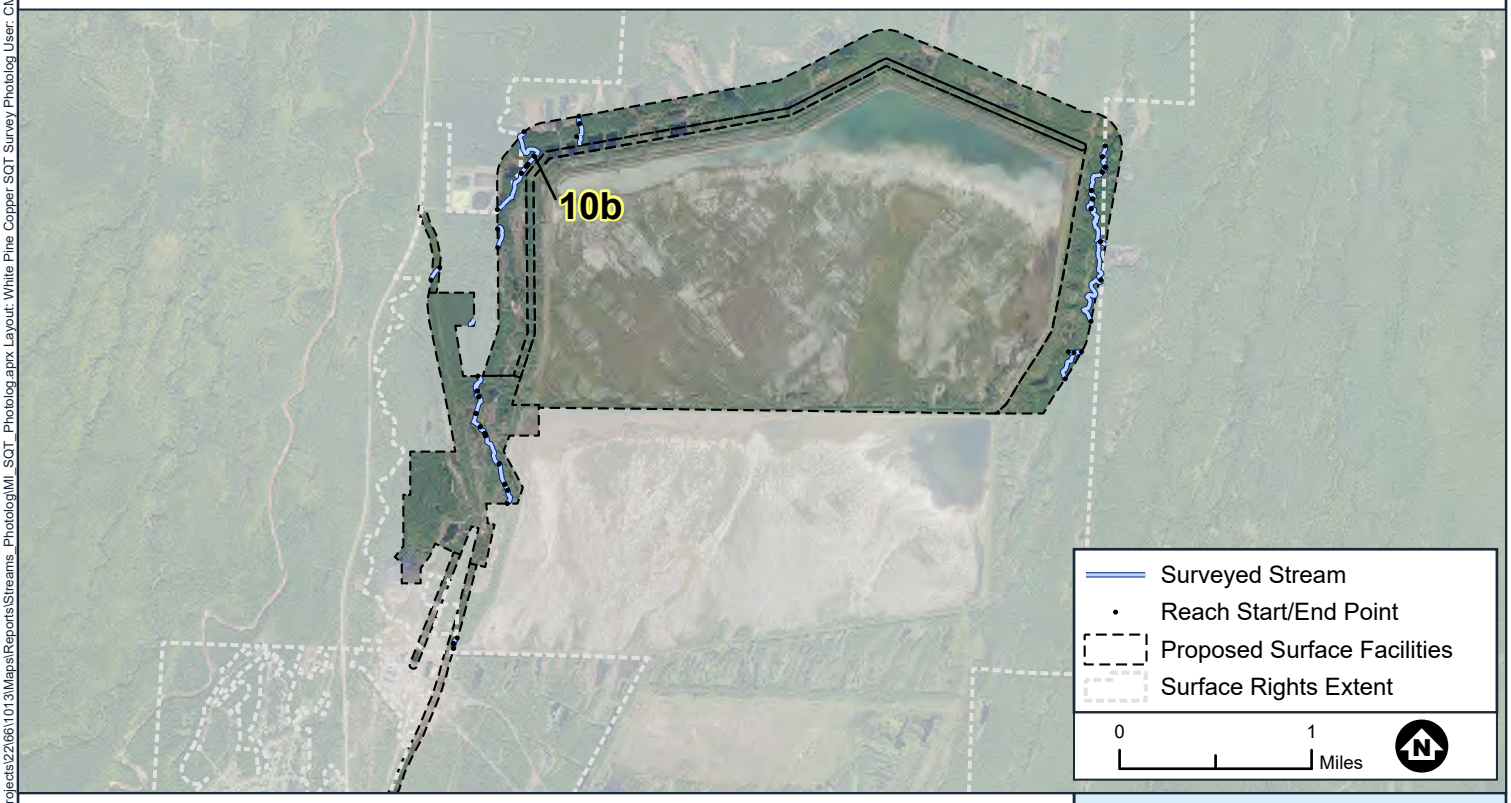
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Stream SQT Survey
Photo Log
White Pine North
White Pine Copper, LLC
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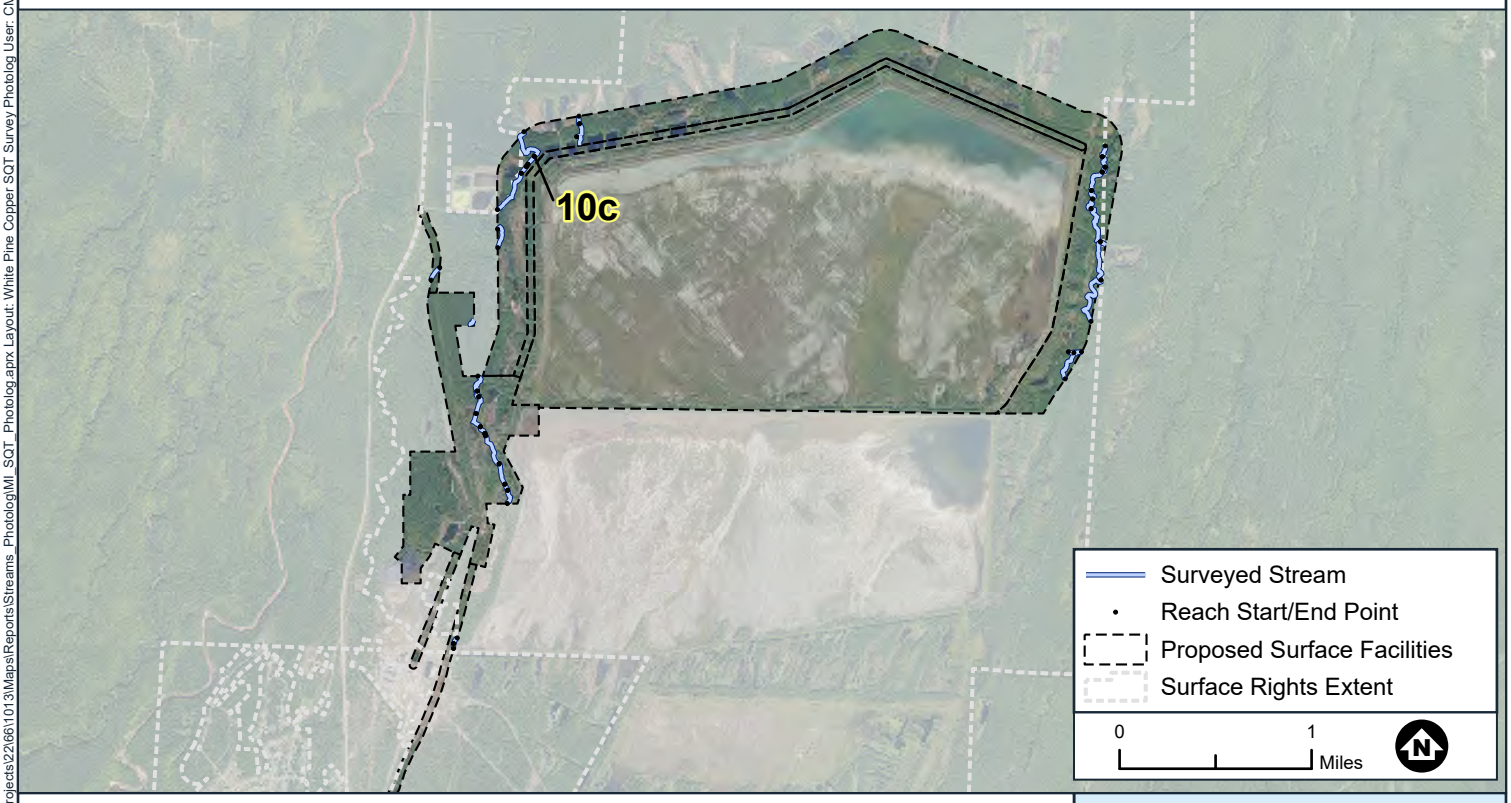
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Stream SQT Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
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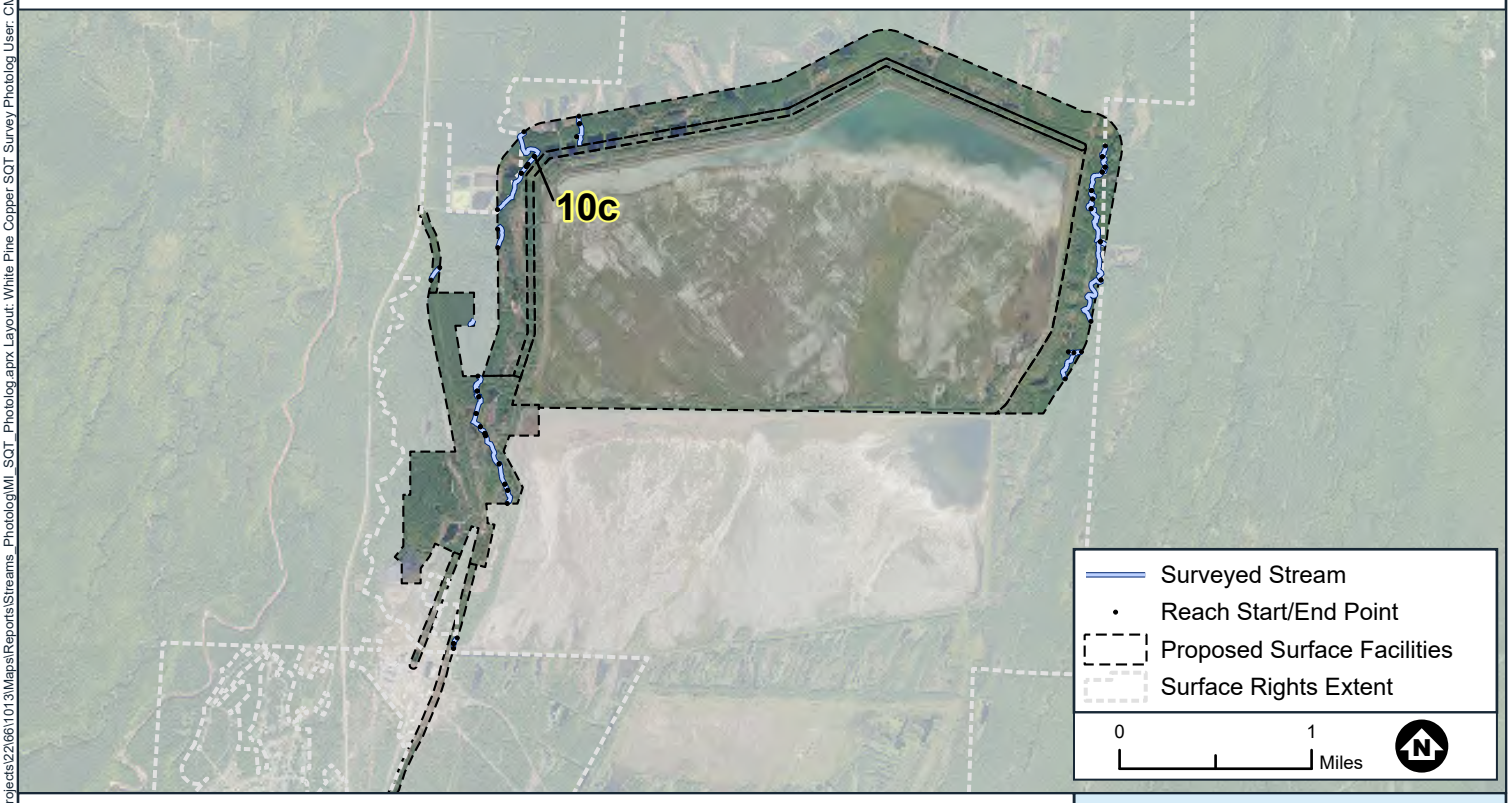
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Stream SQT Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
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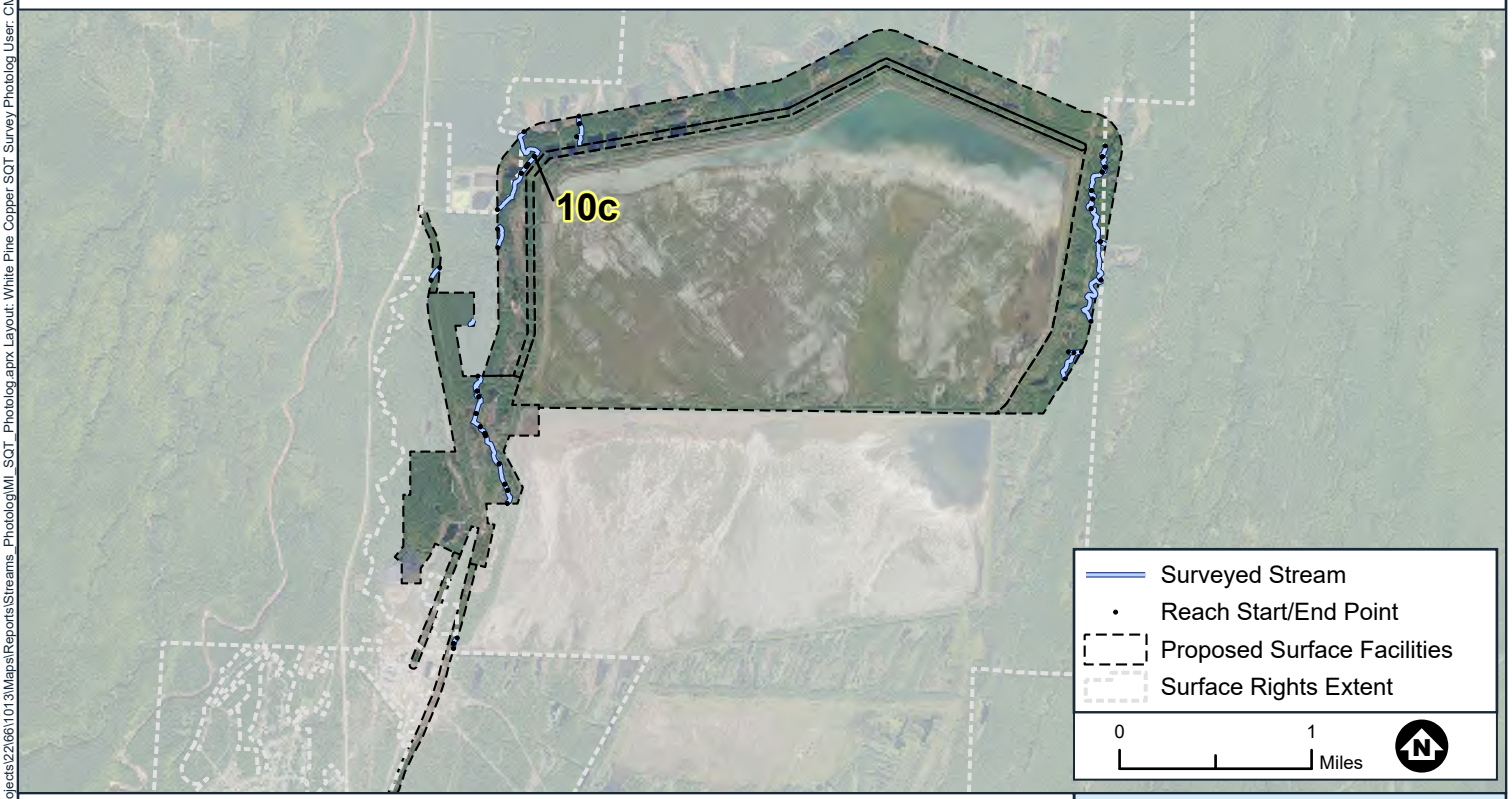
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White Pine North
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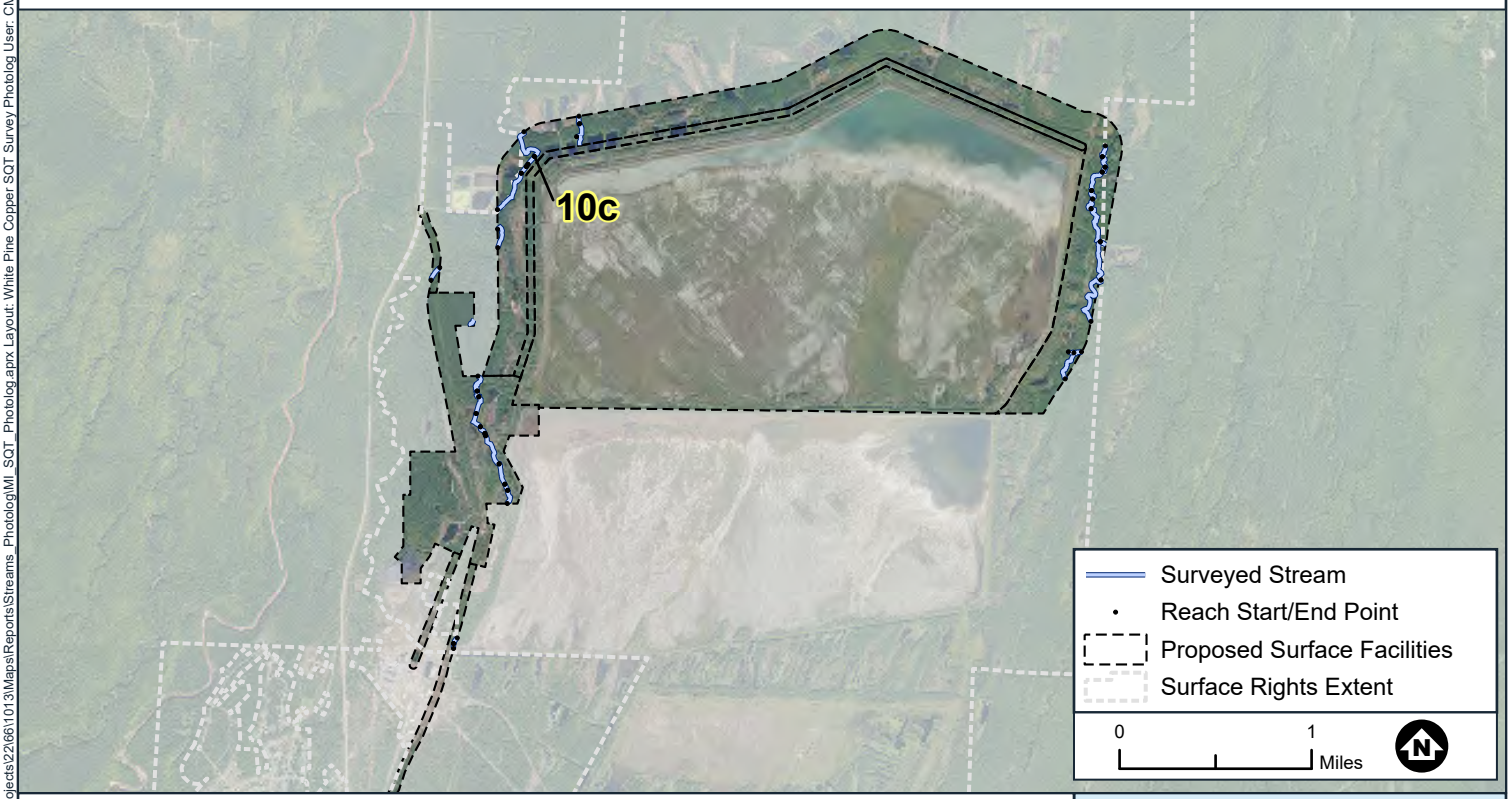
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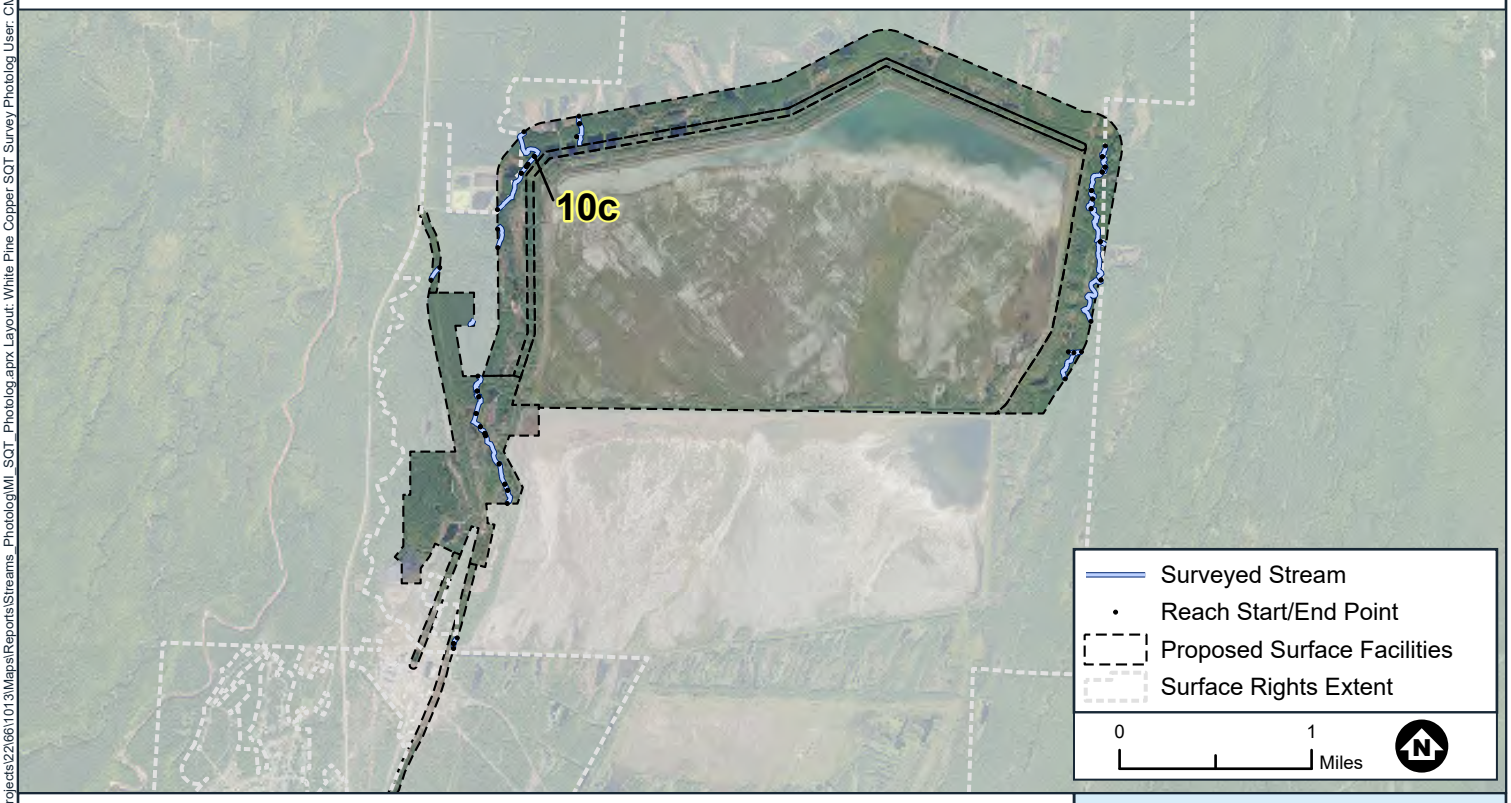
Photo caption: Streambank Assessed for Erosion

Stream SQT Survey
Photo Log
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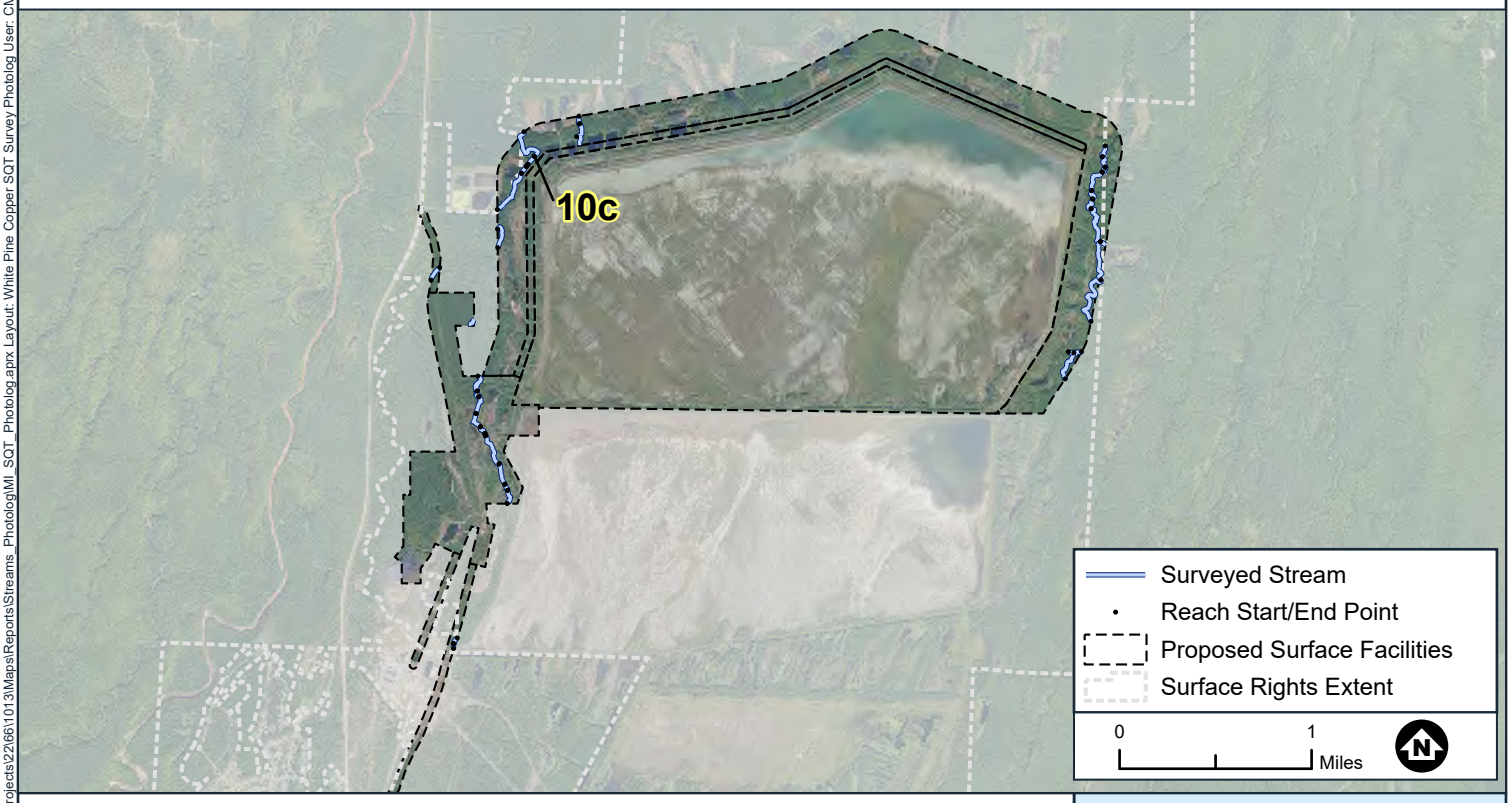
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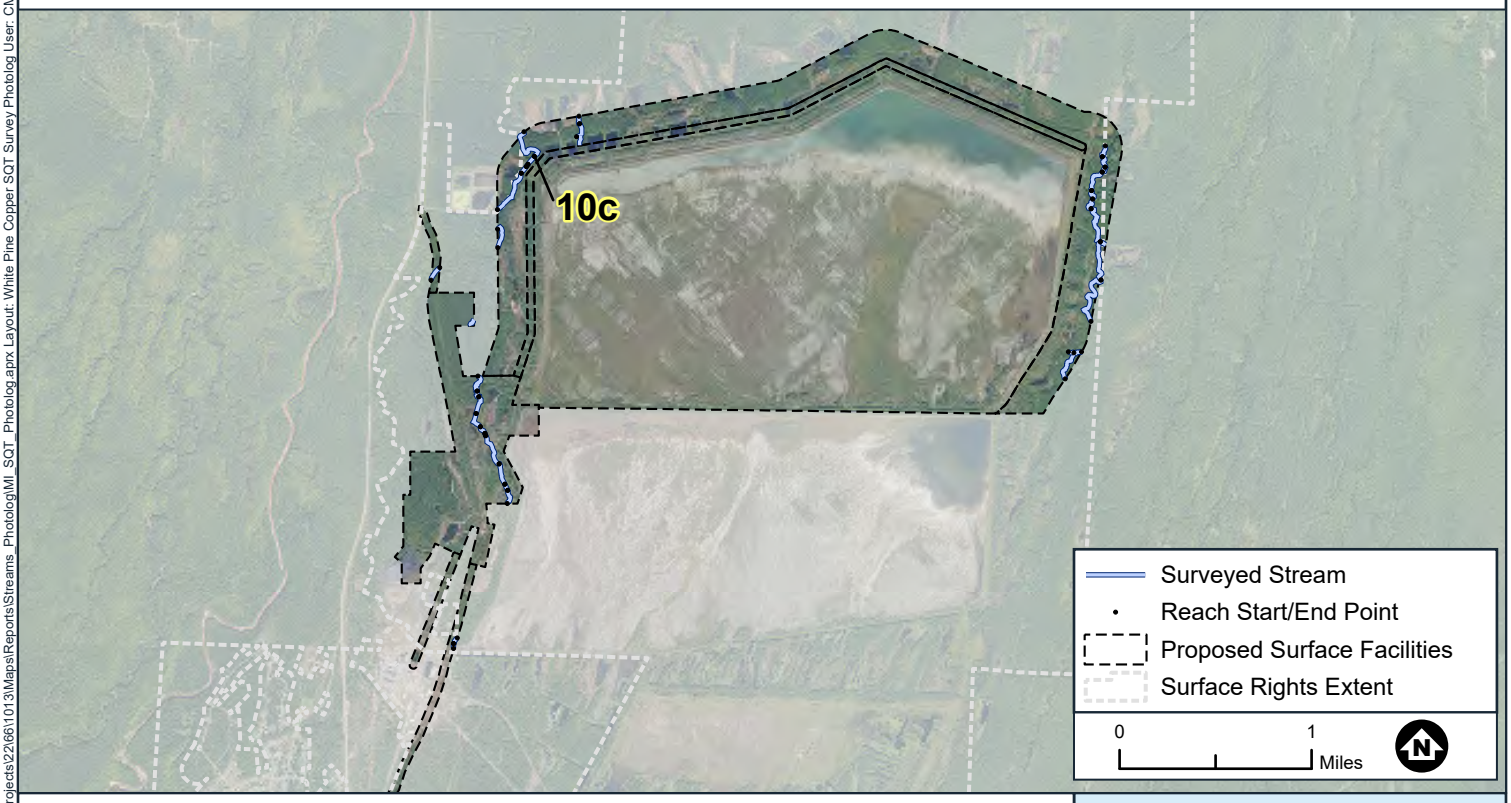
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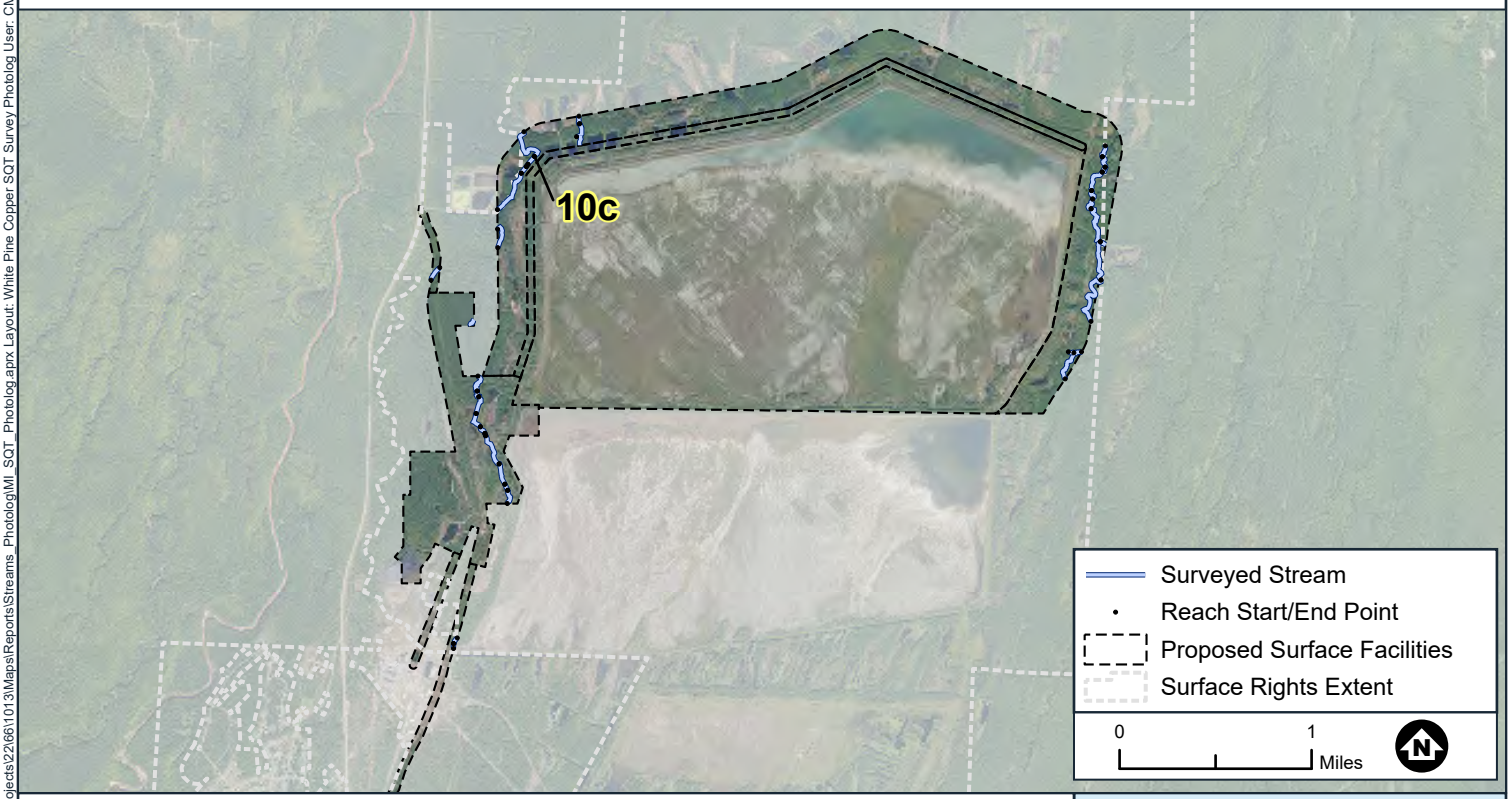
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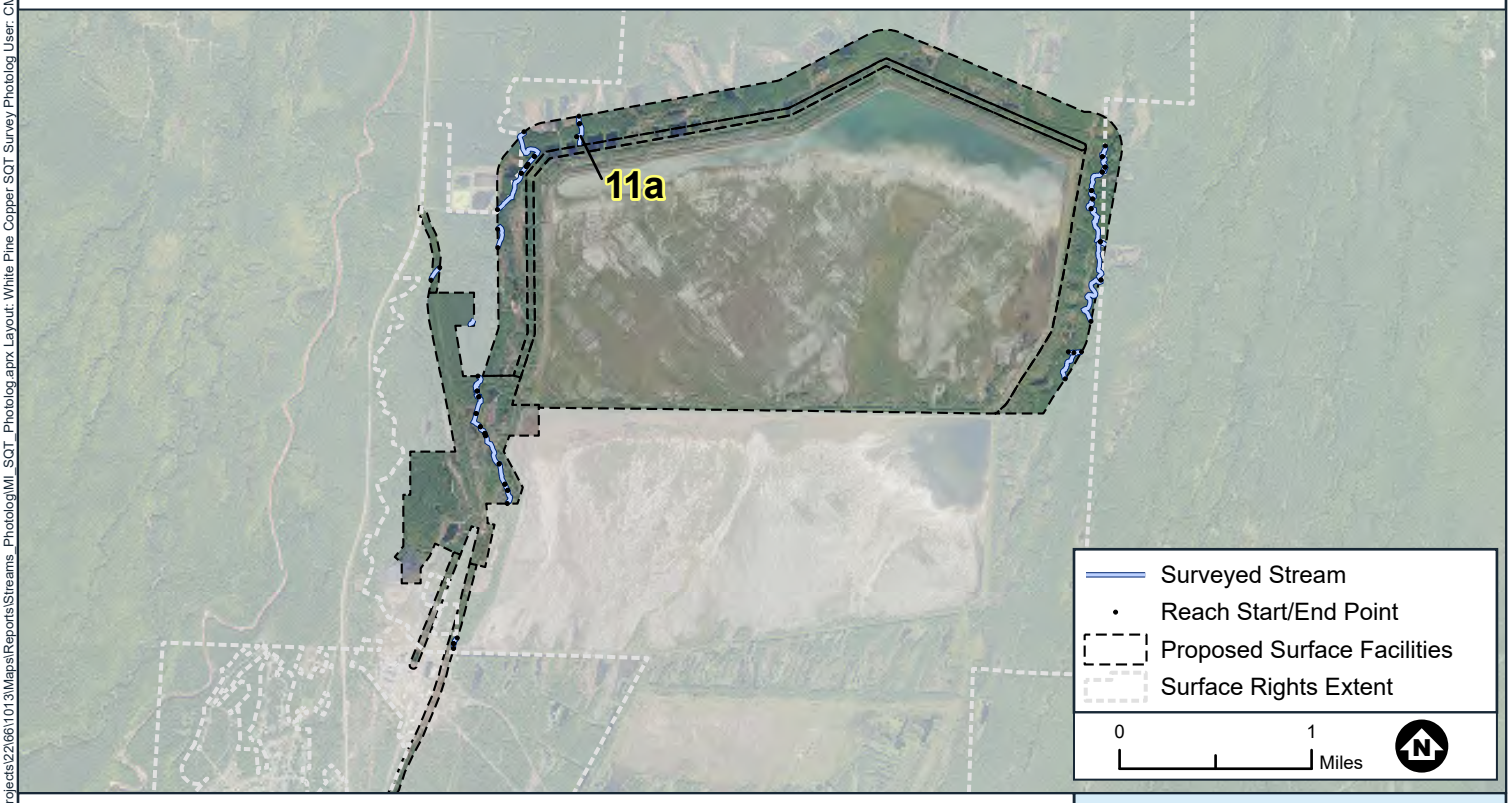
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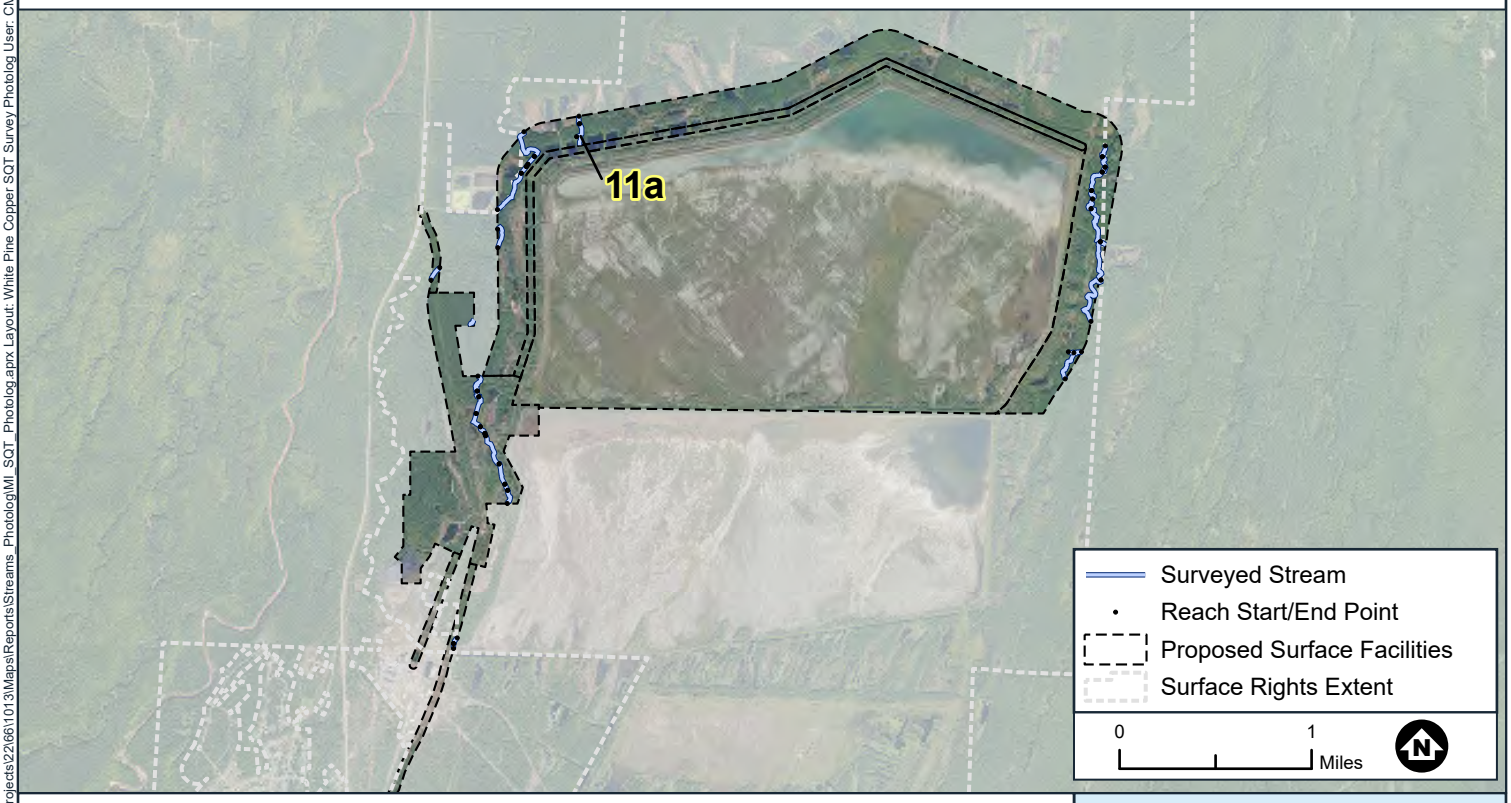
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Stream SQT Survey
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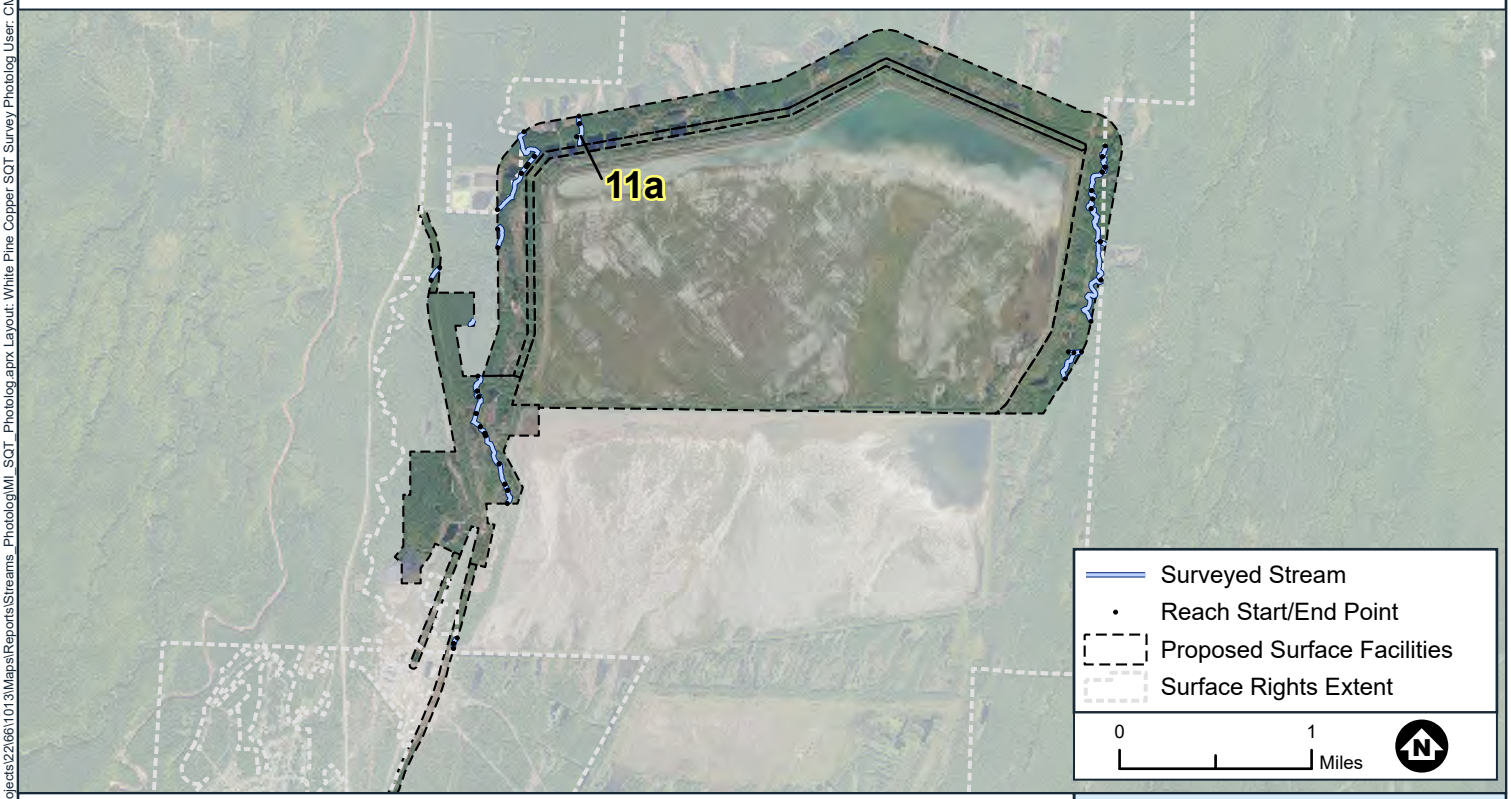
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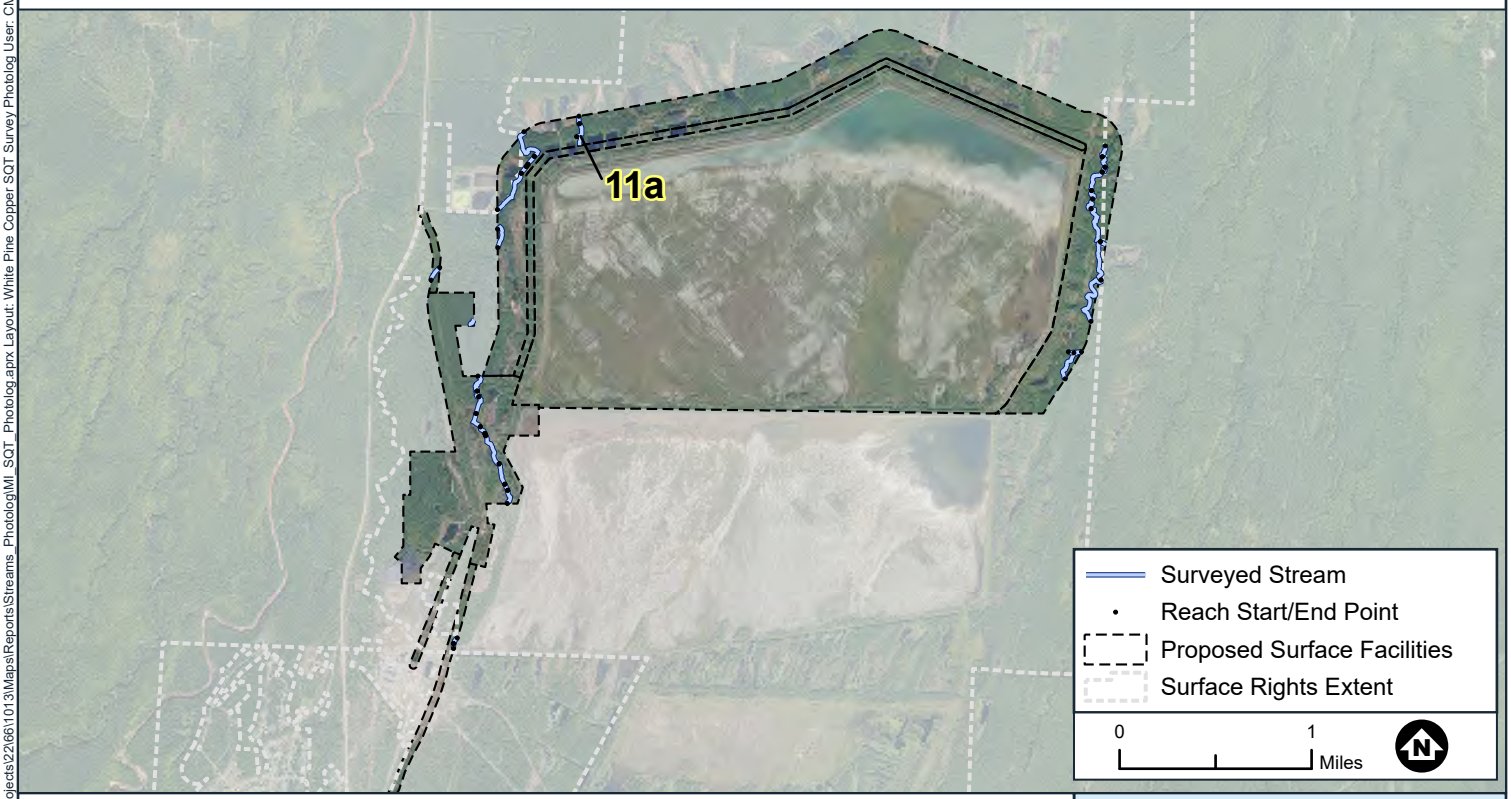
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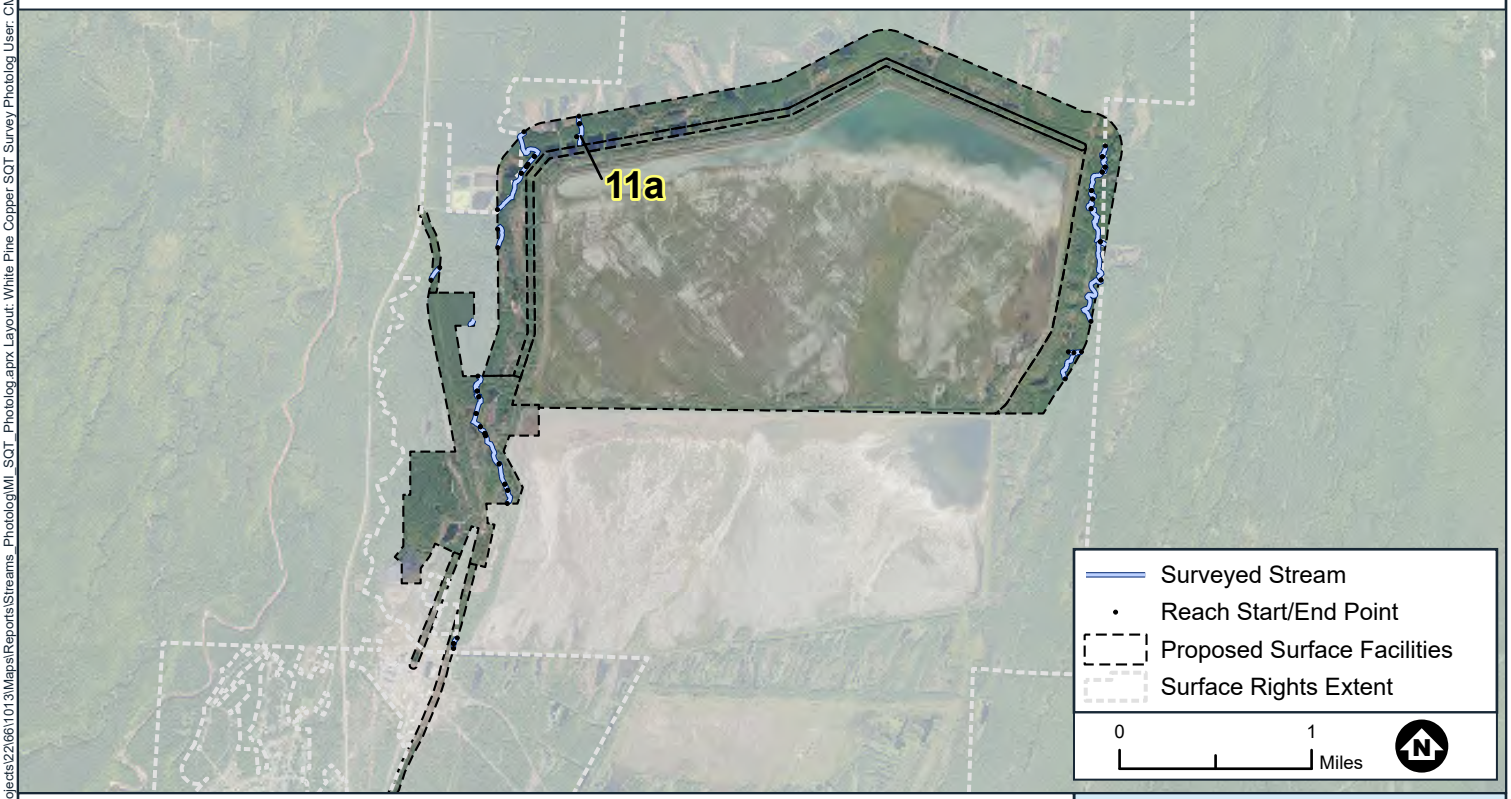
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Ontonagon County, Michigan

BARR

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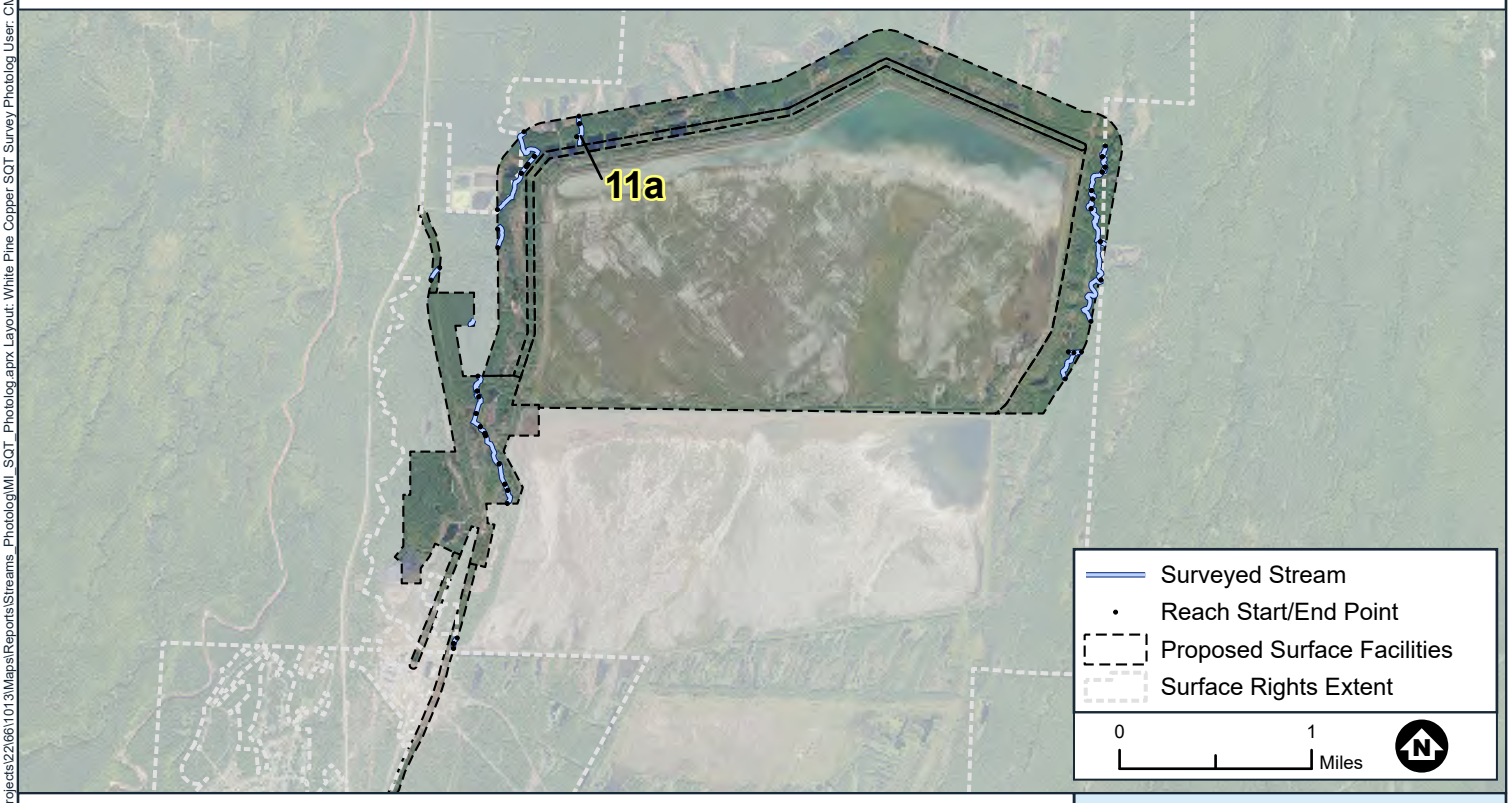
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Stream SQT Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

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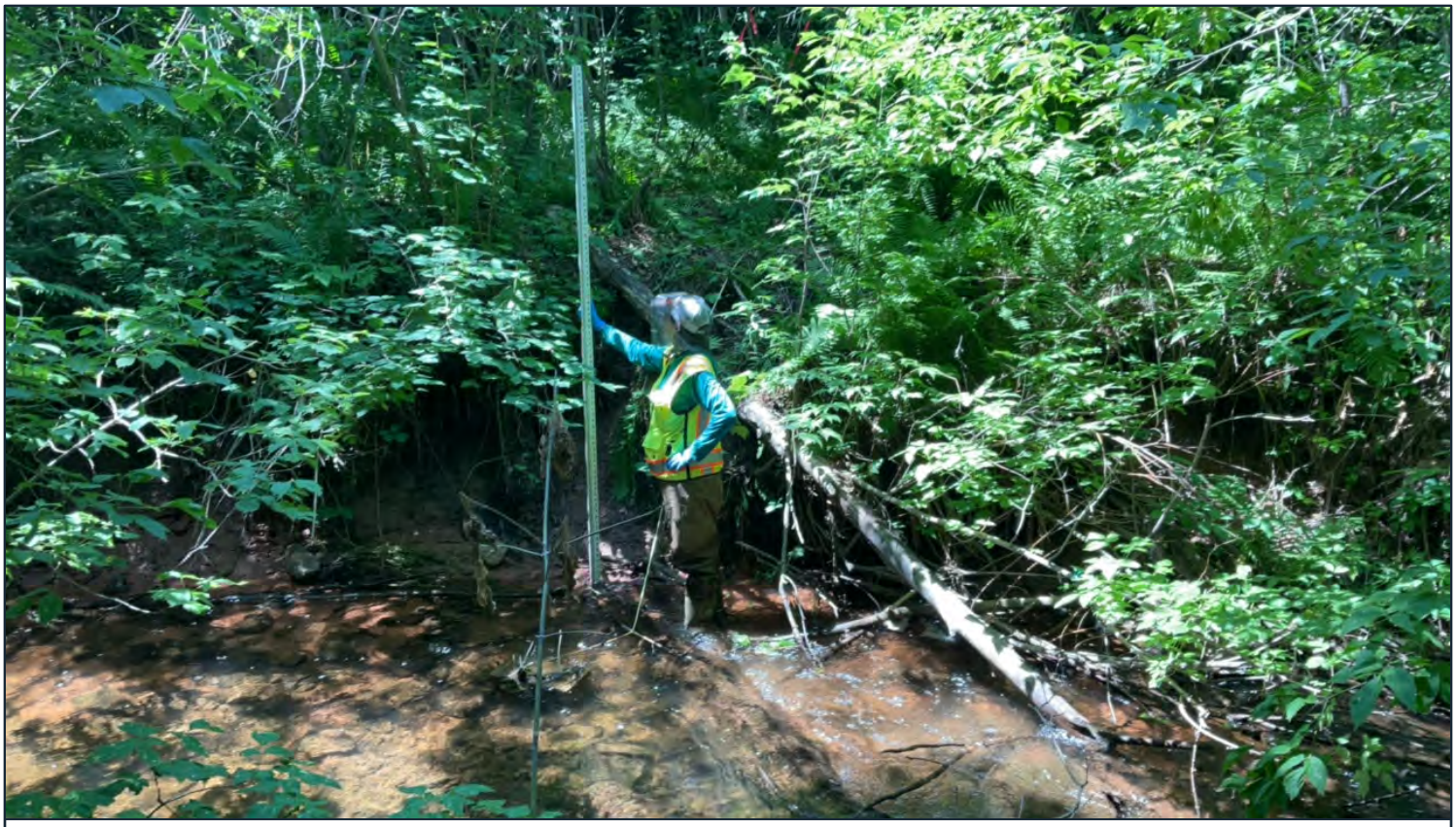
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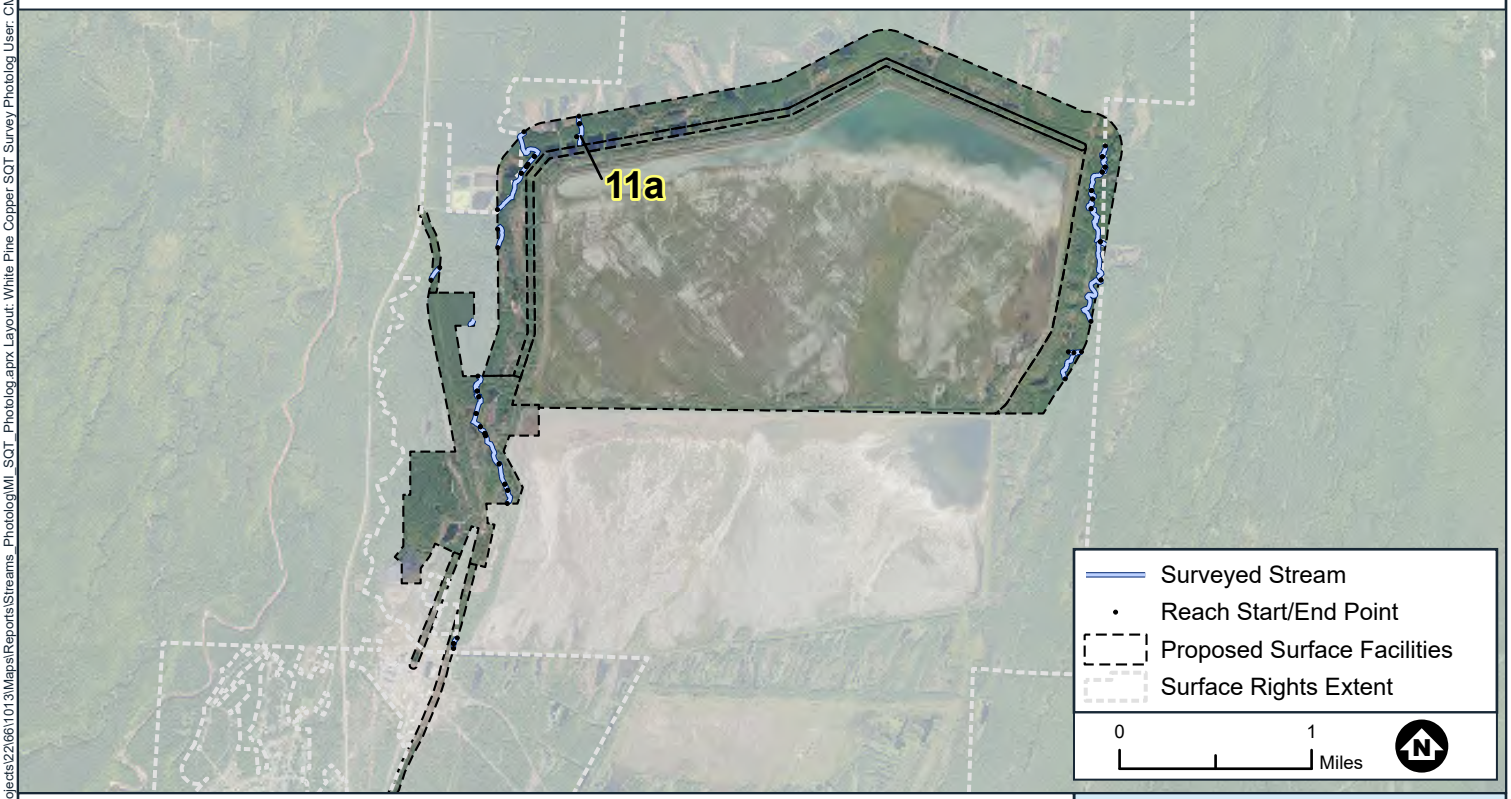
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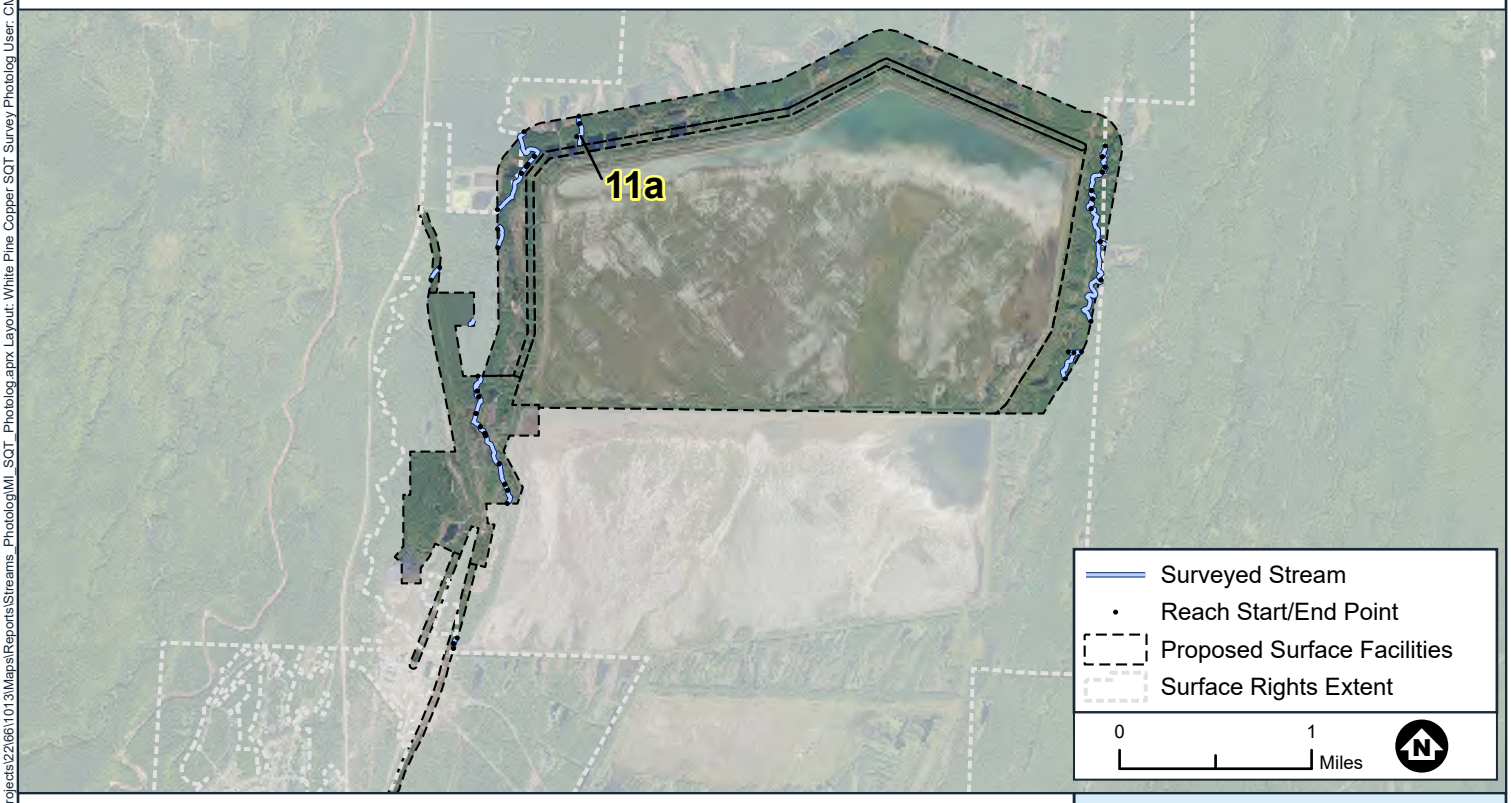
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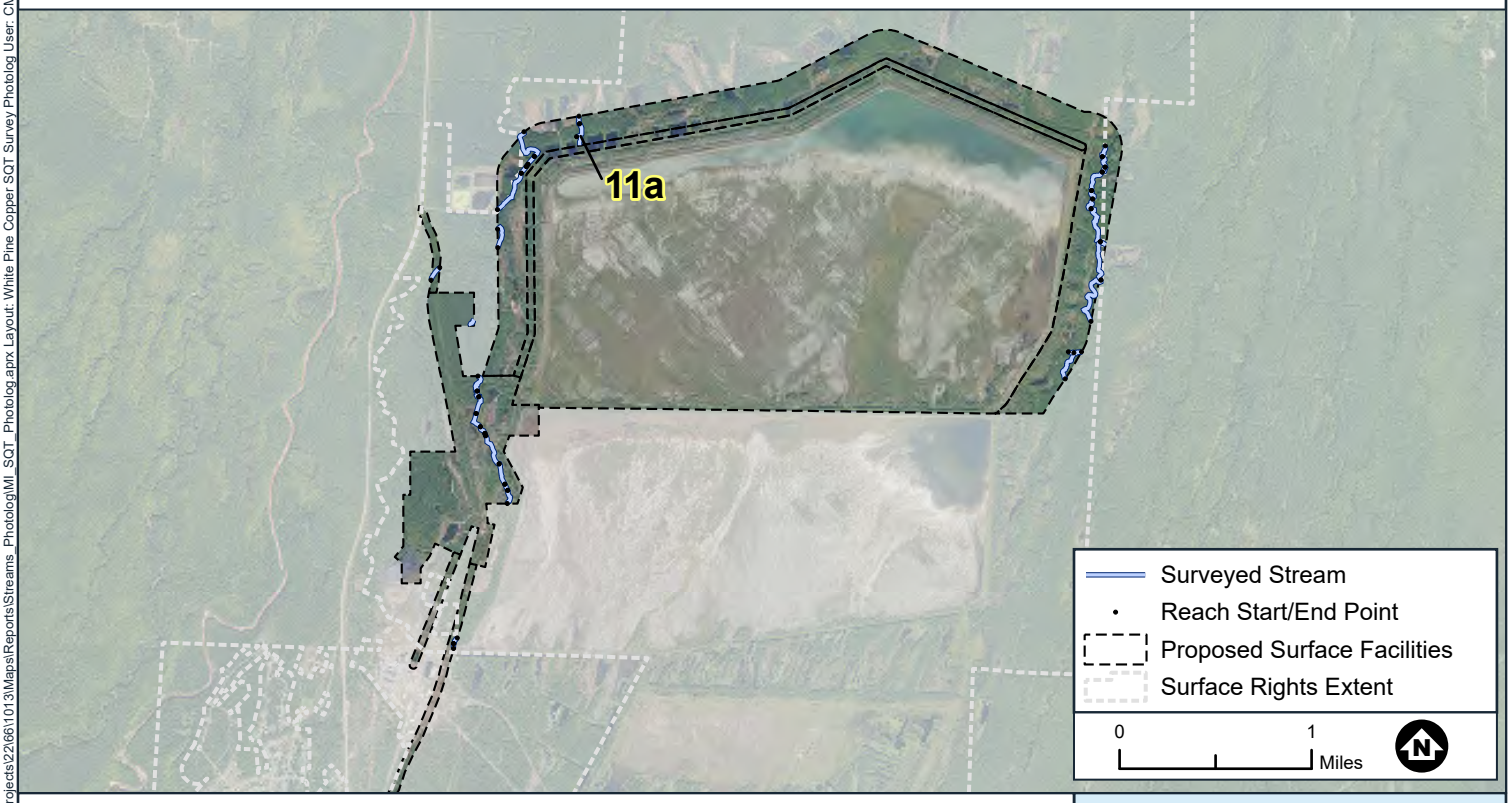
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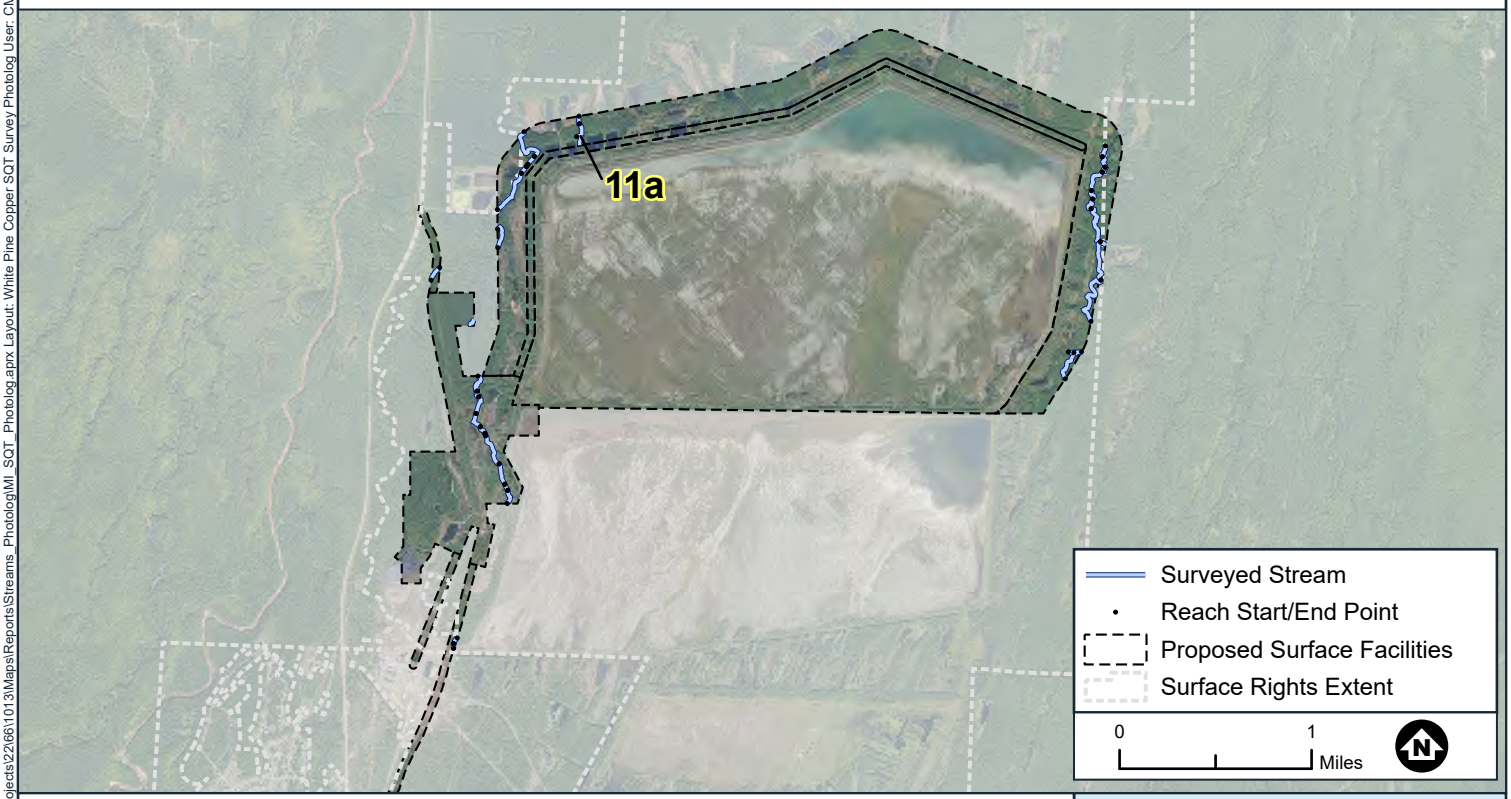
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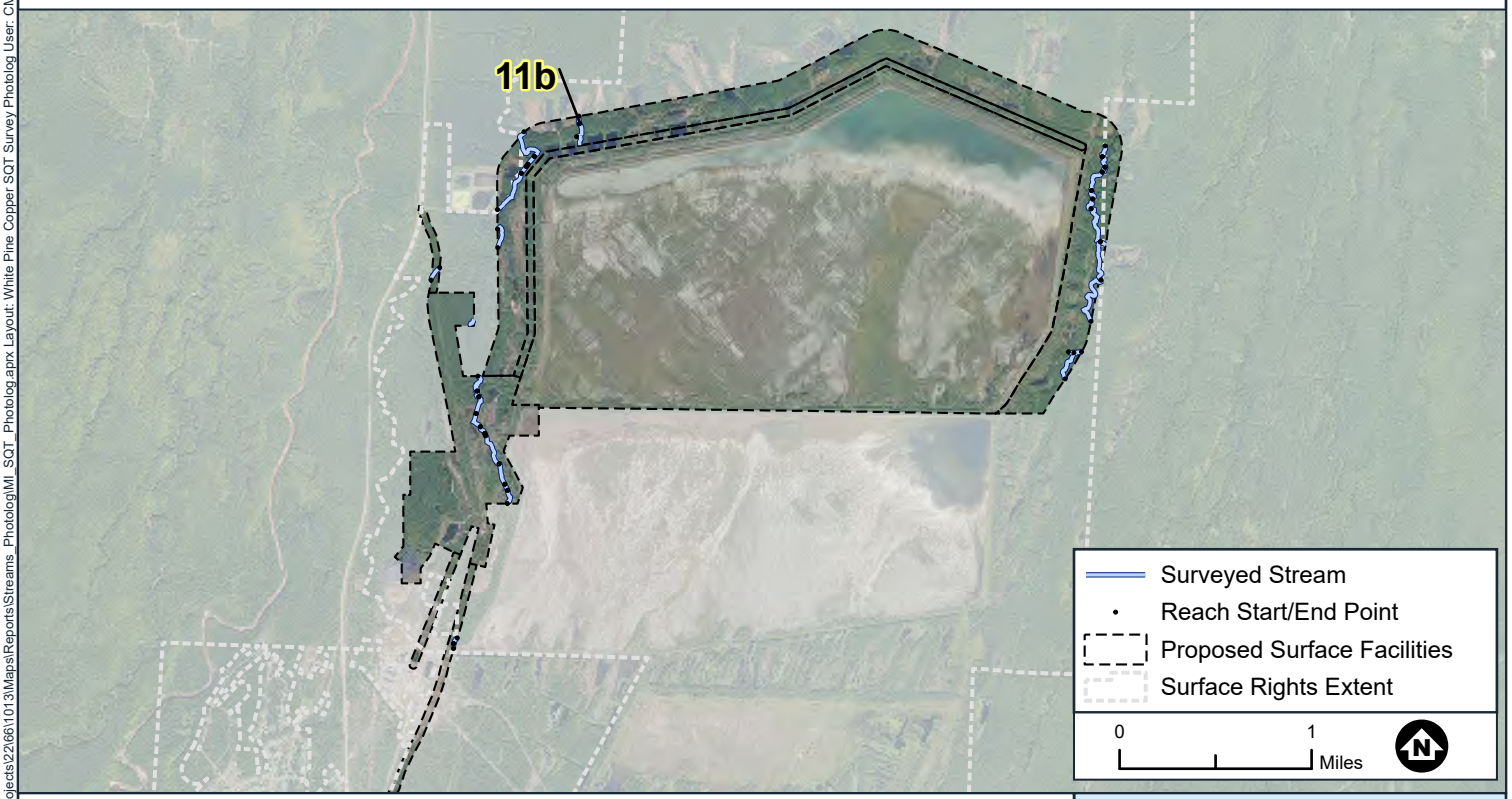
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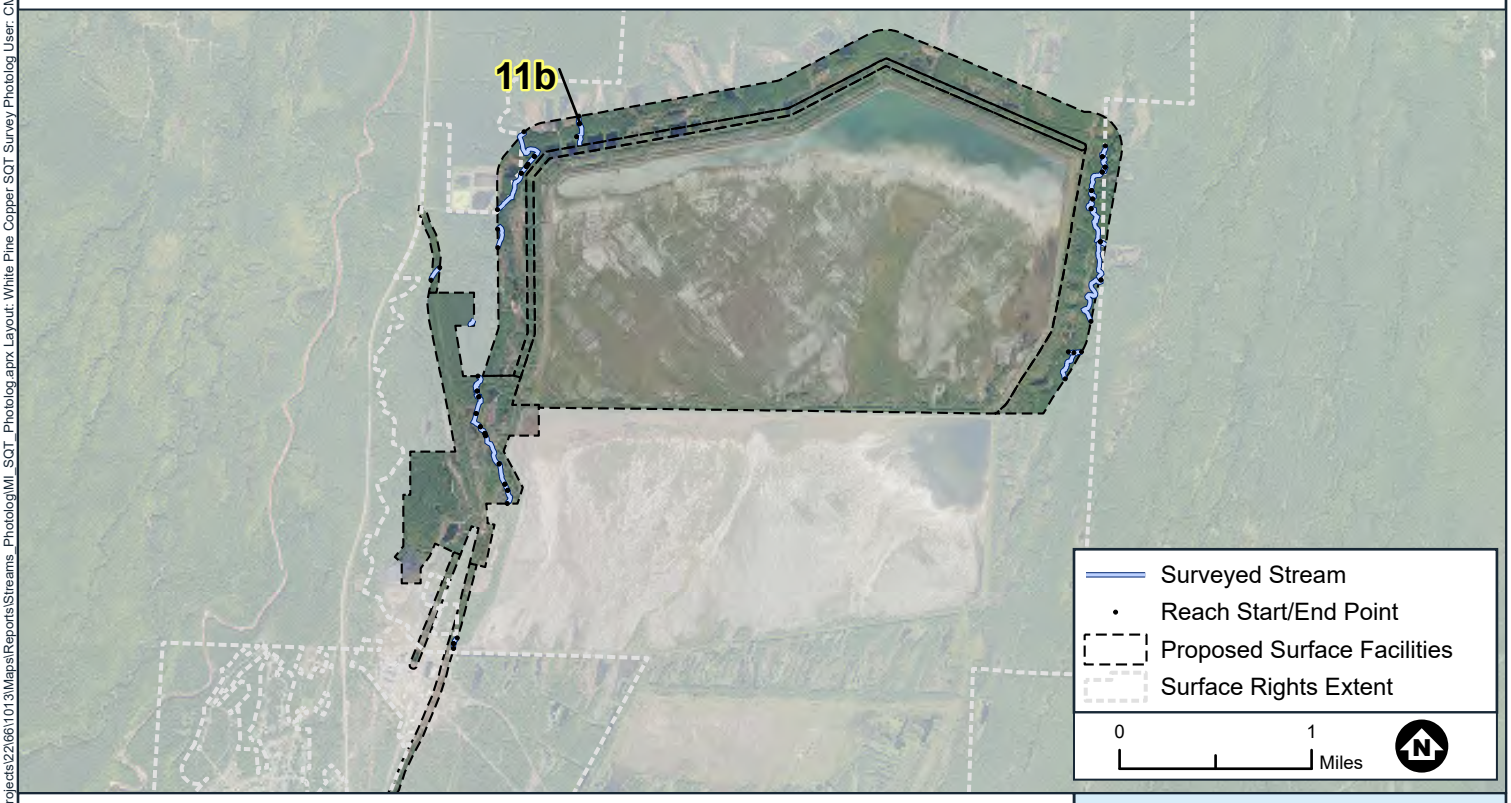
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Stream SQT Survey
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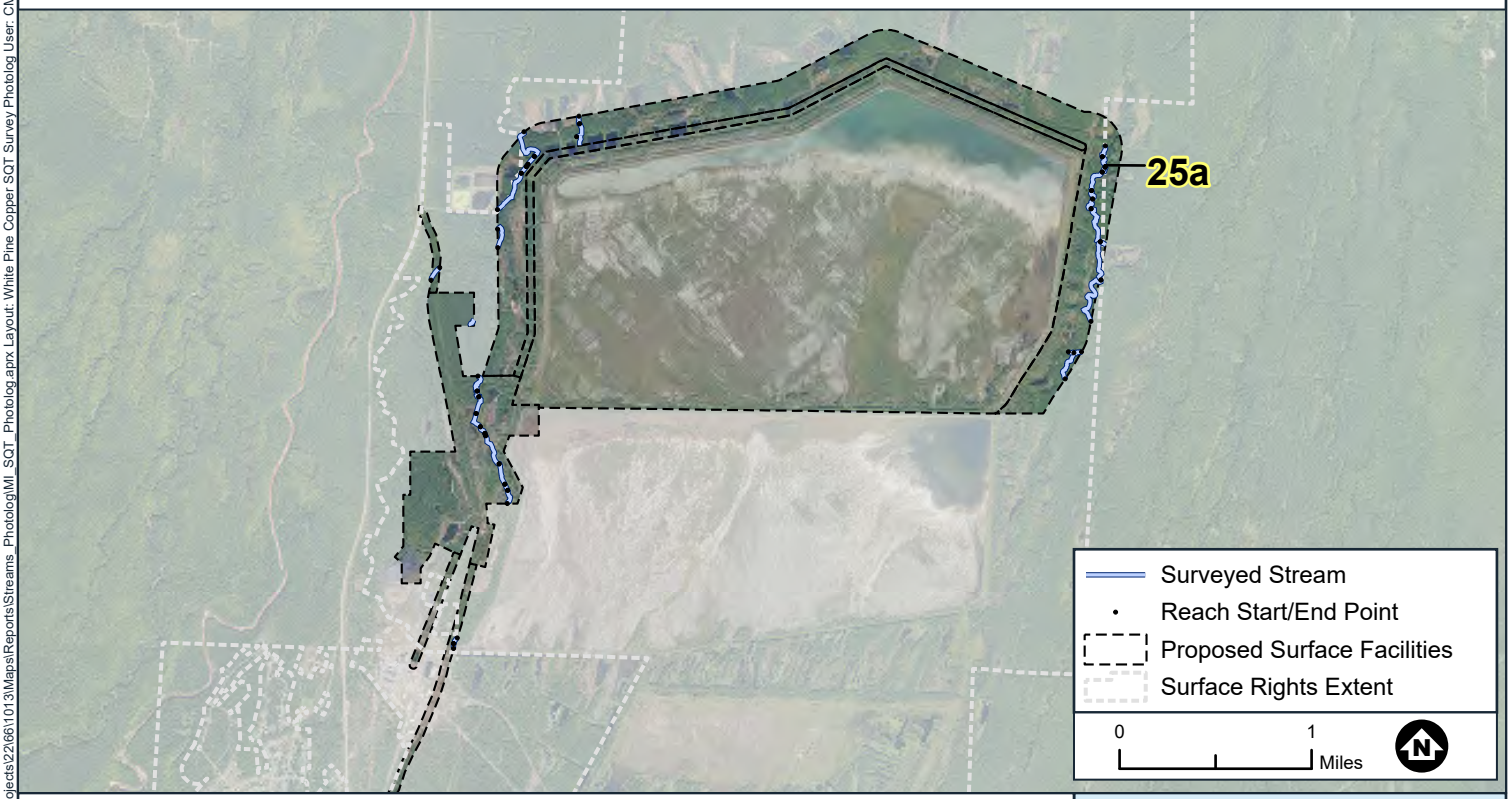
Photo caption: End of Reach, Looking Upstream

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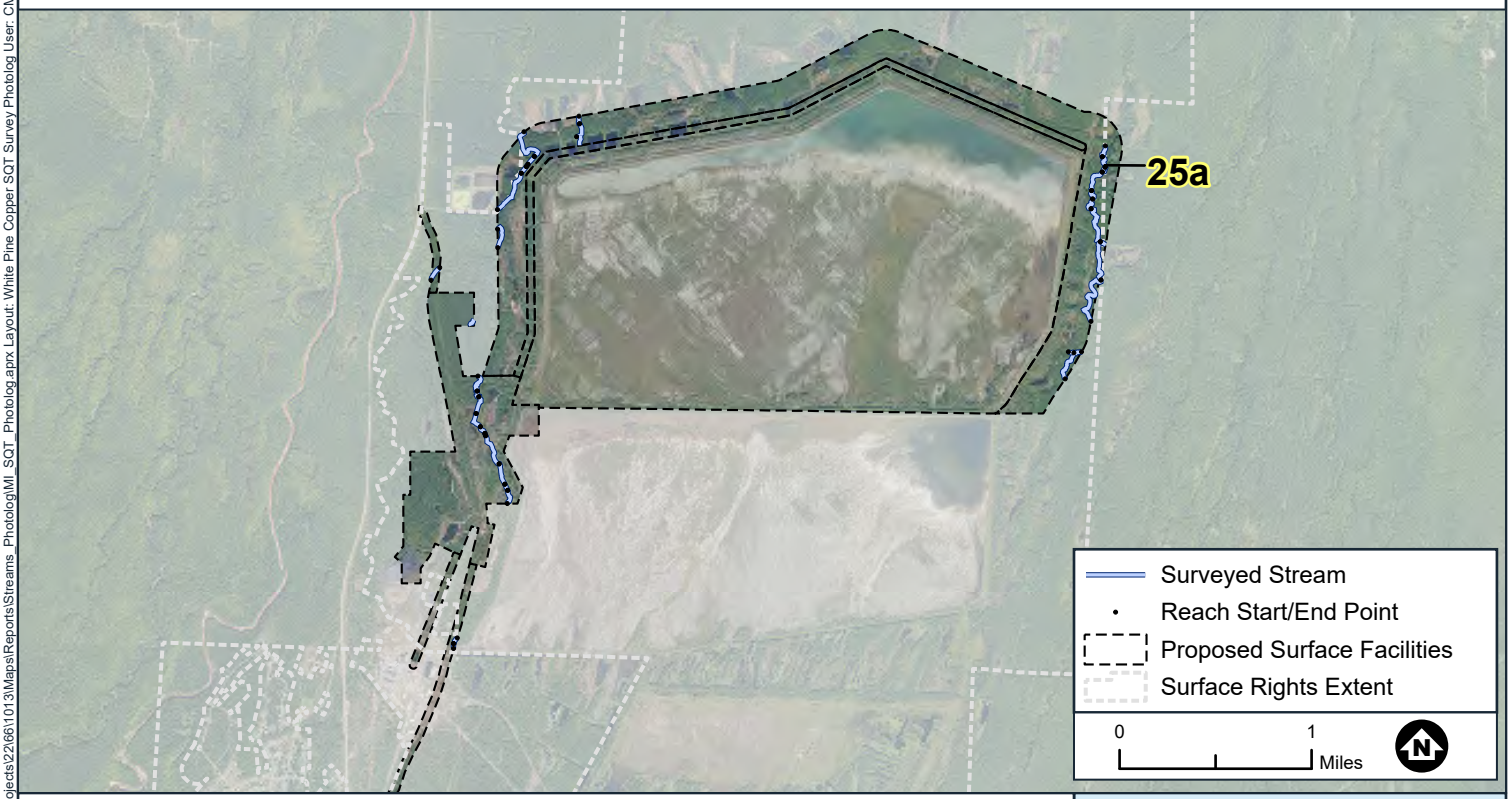
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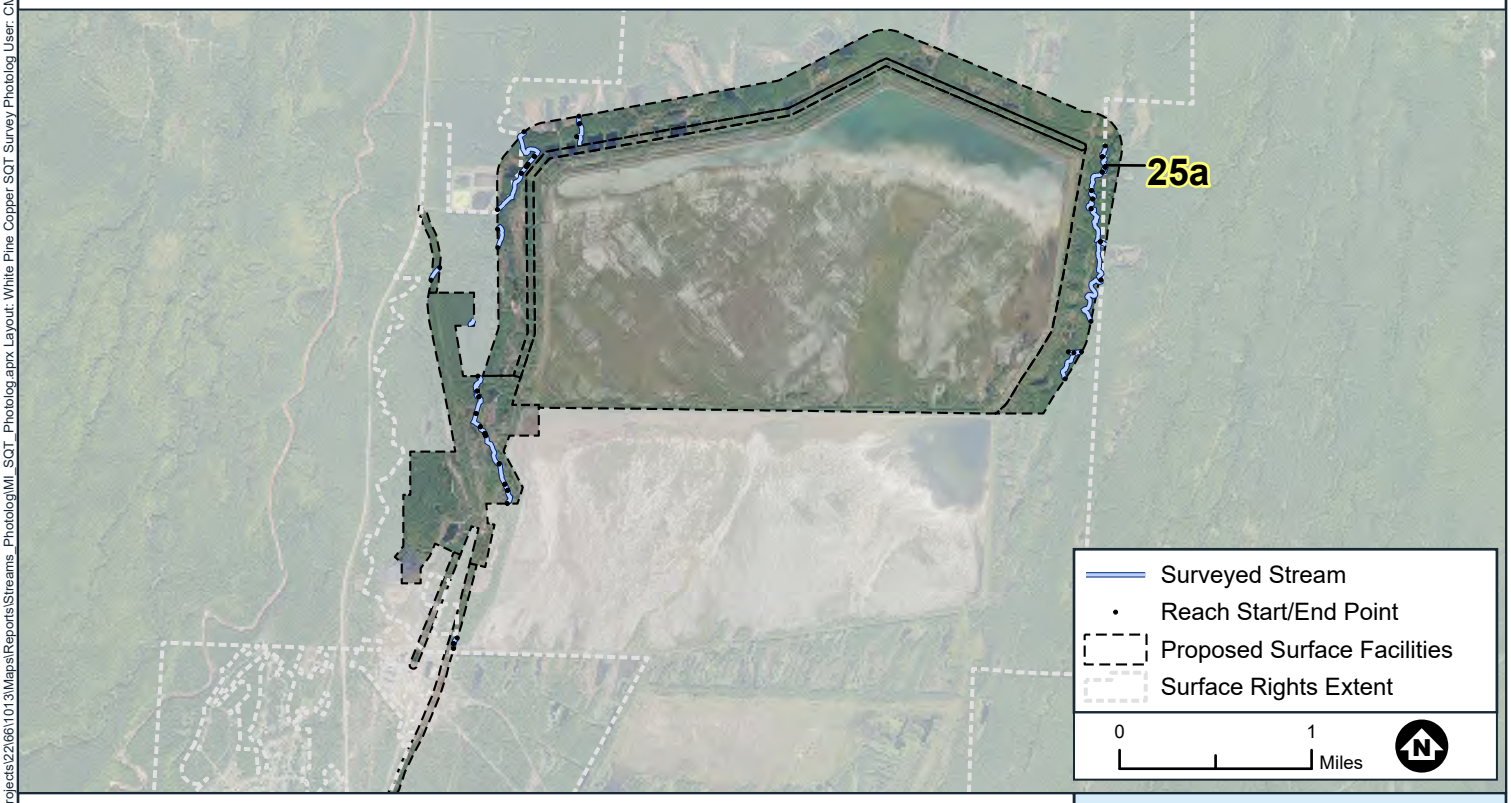
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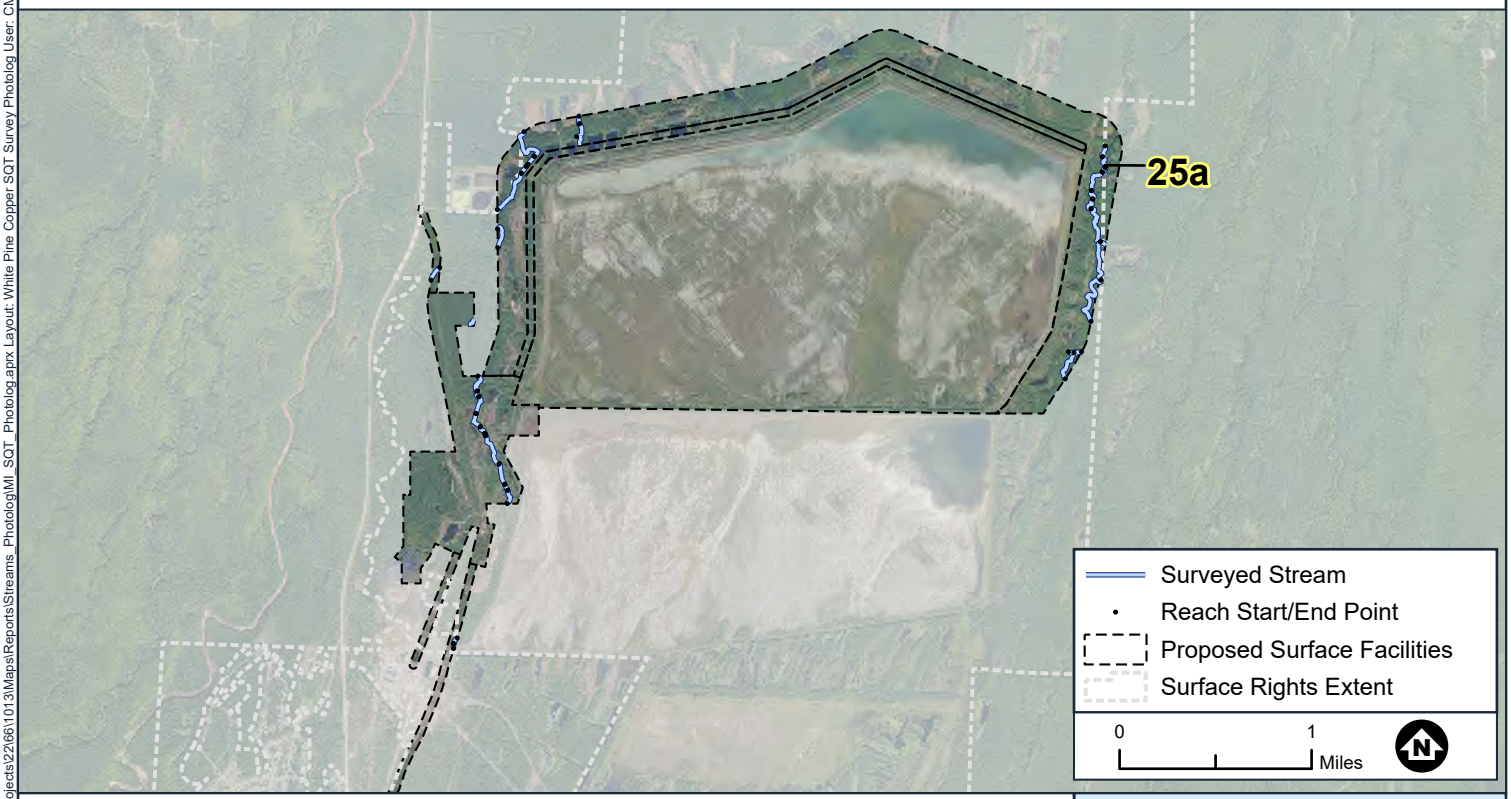
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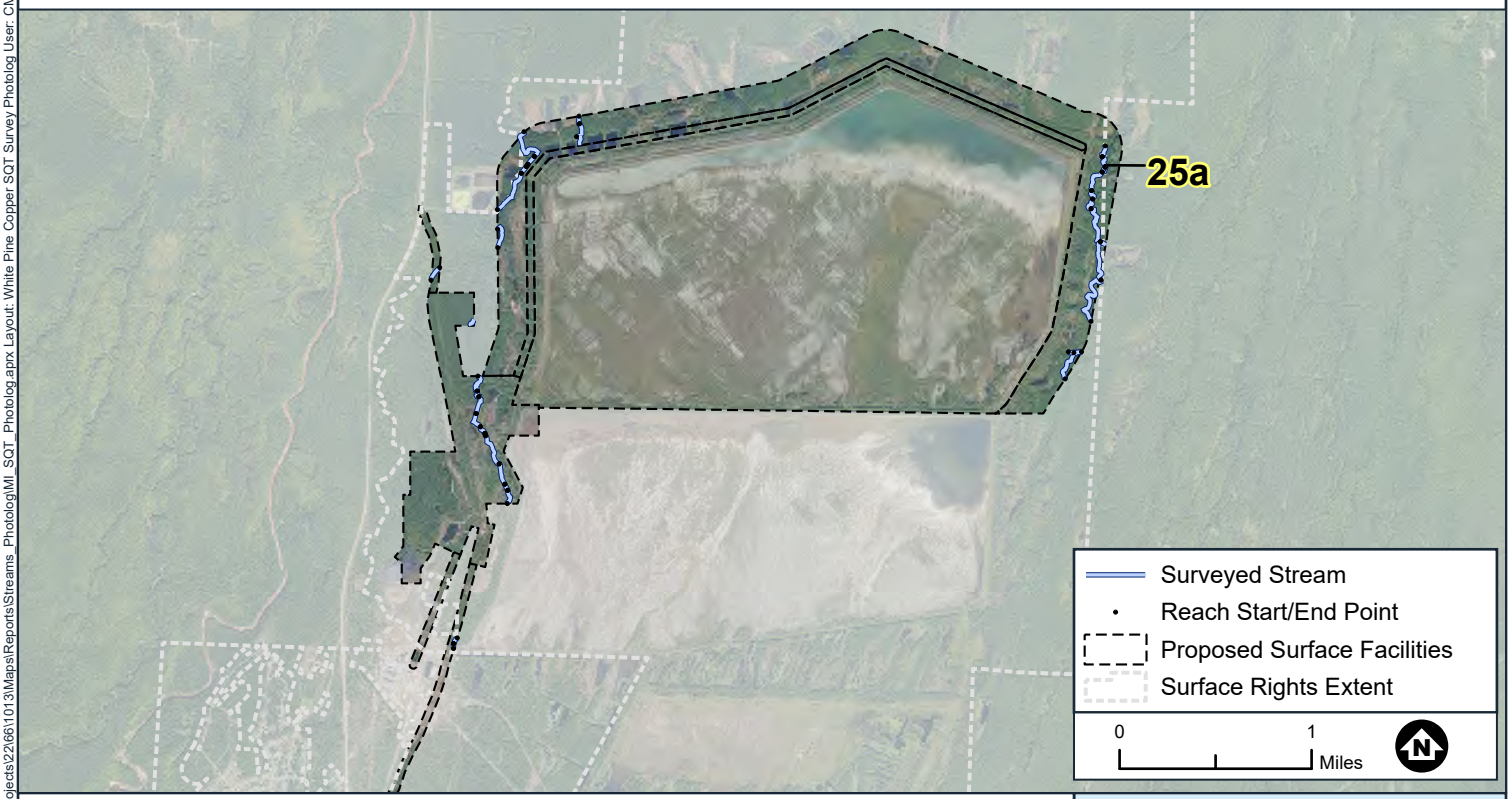
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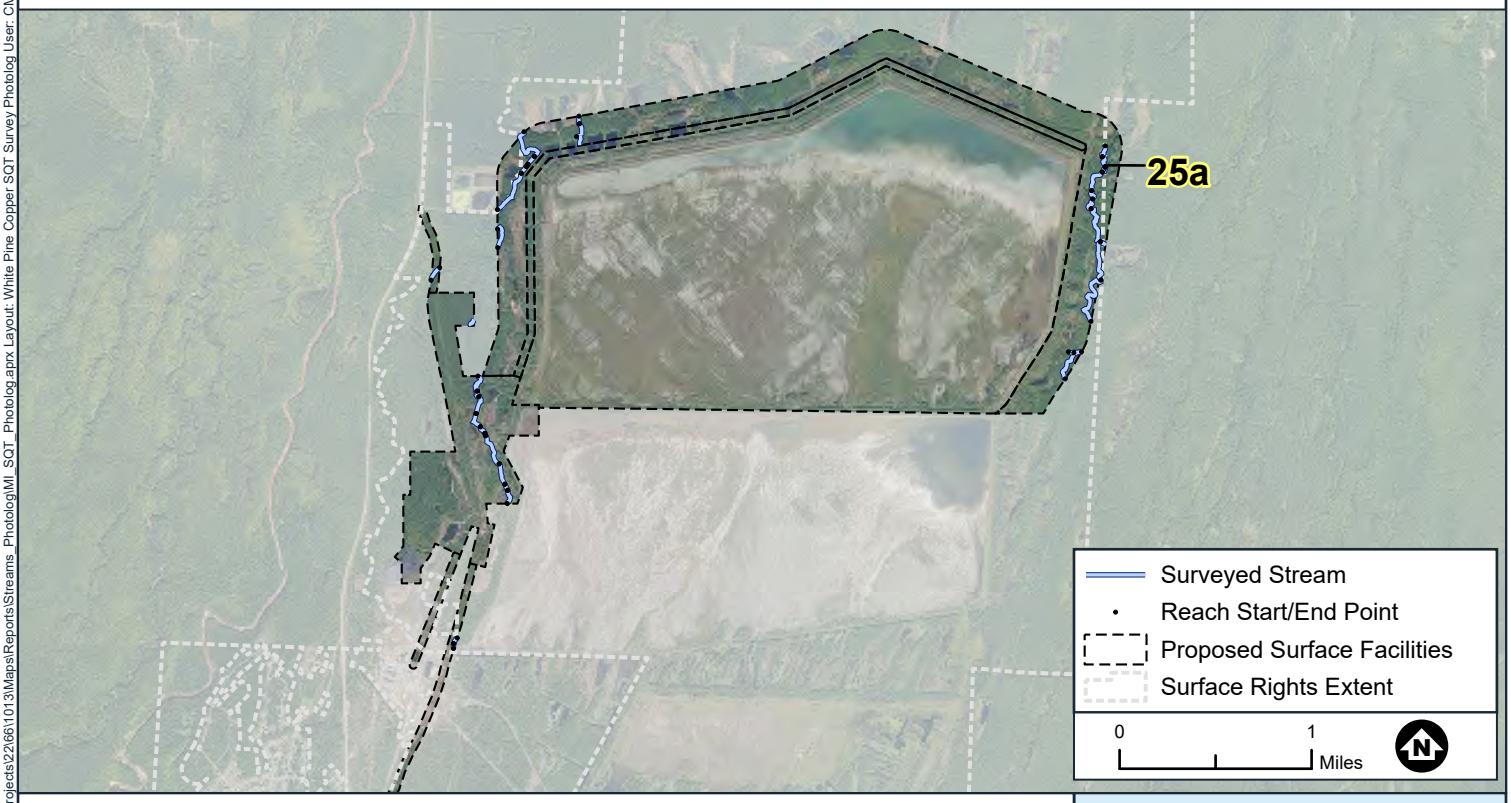
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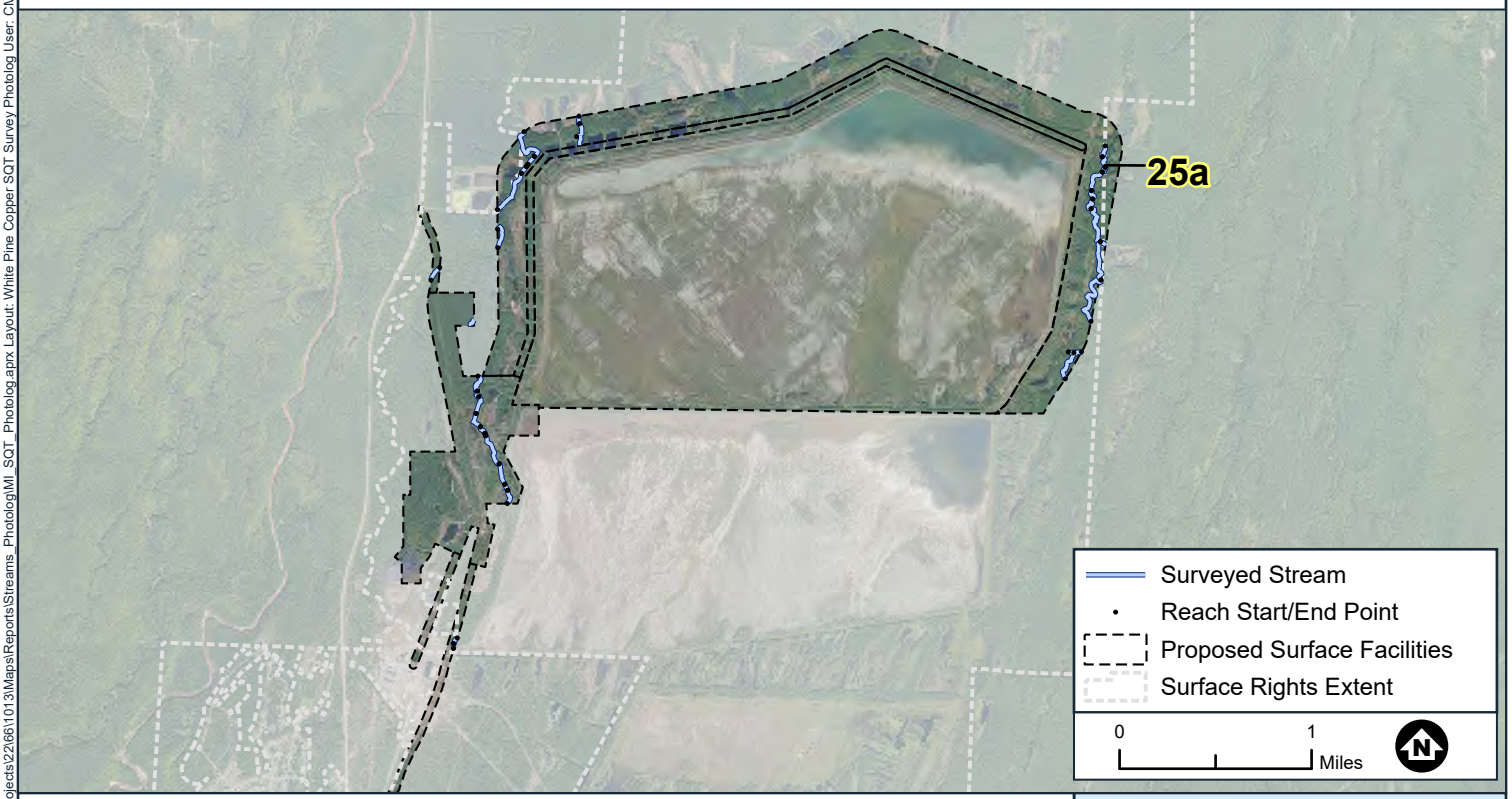
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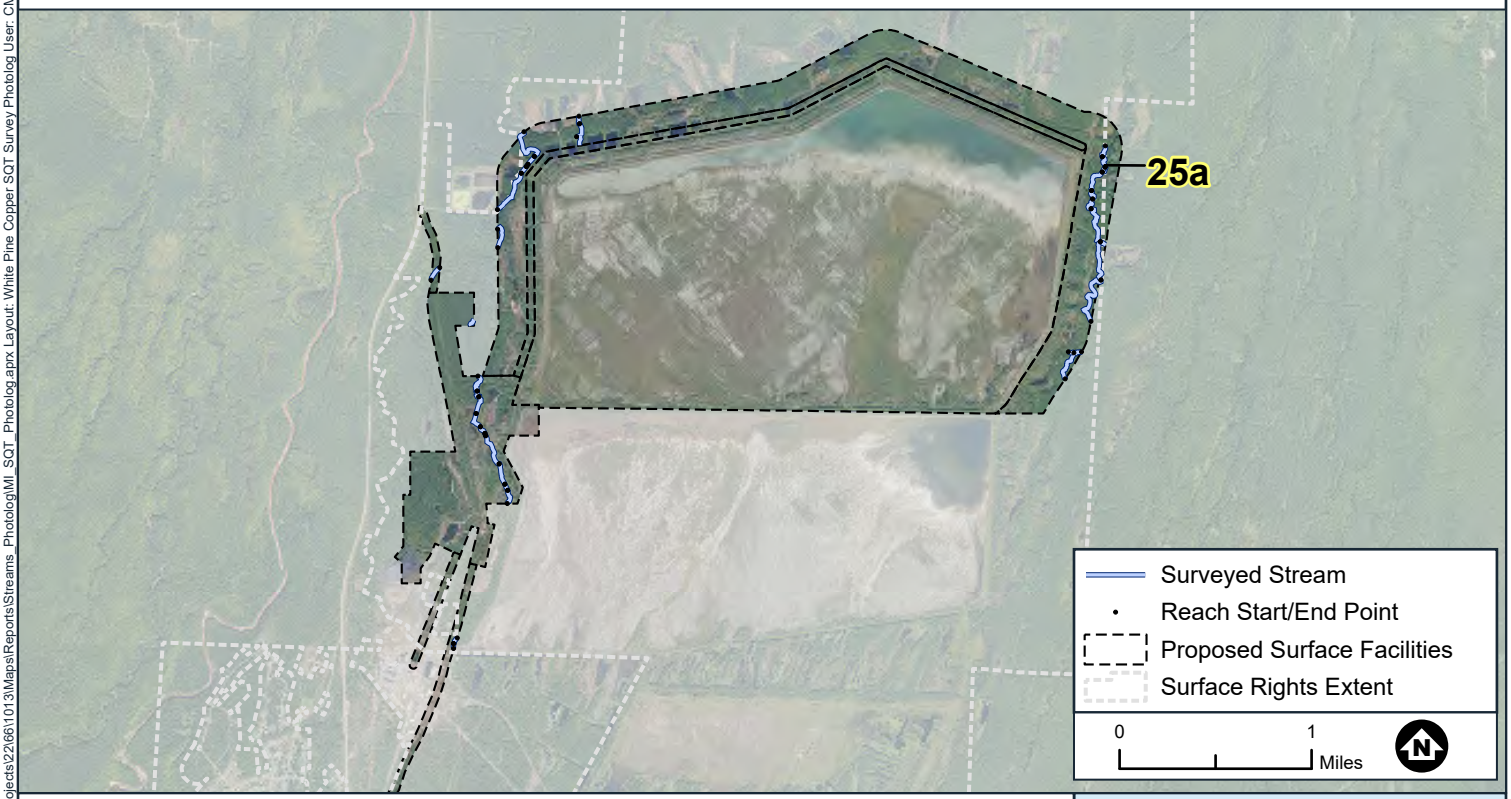
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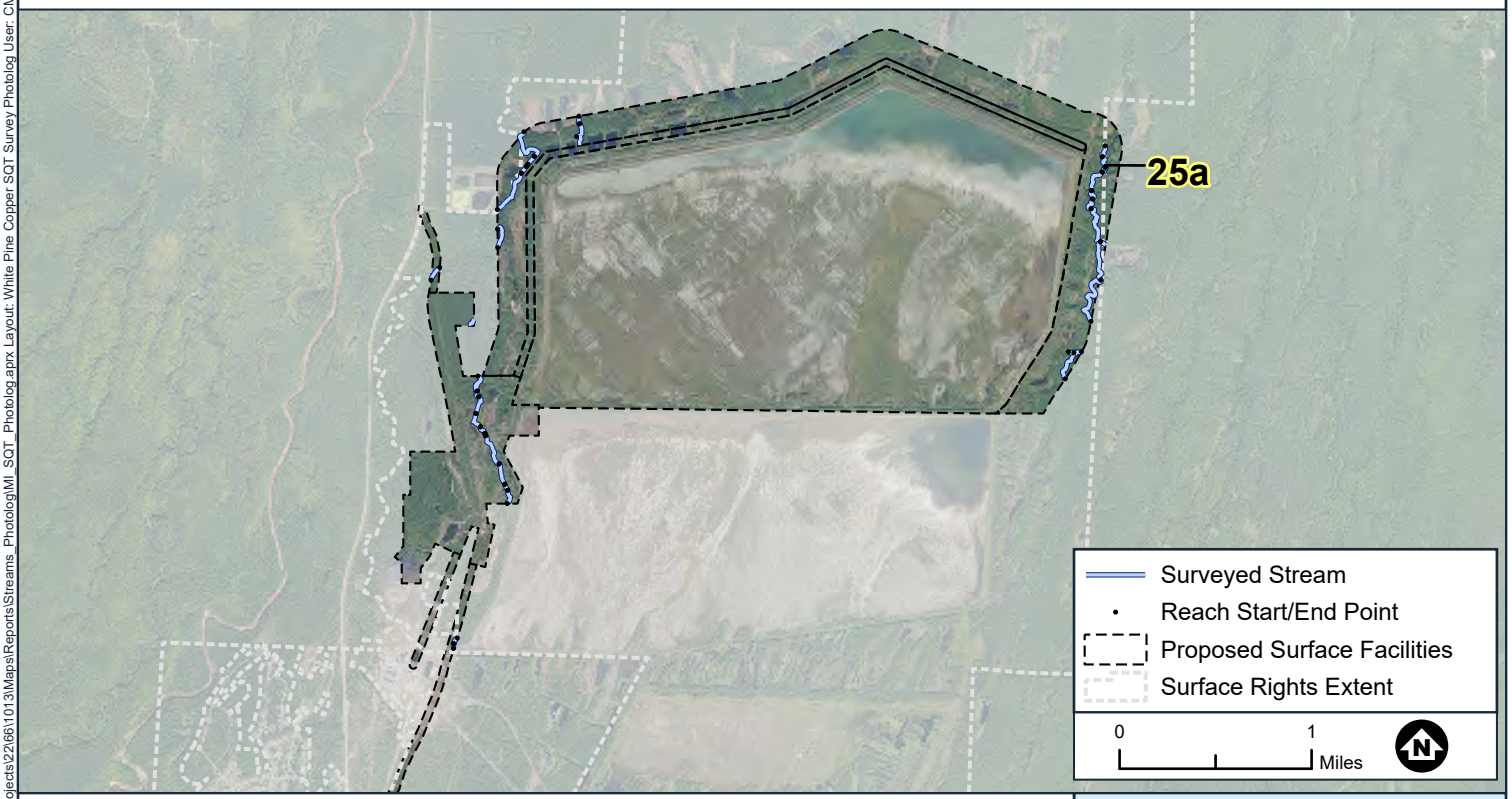
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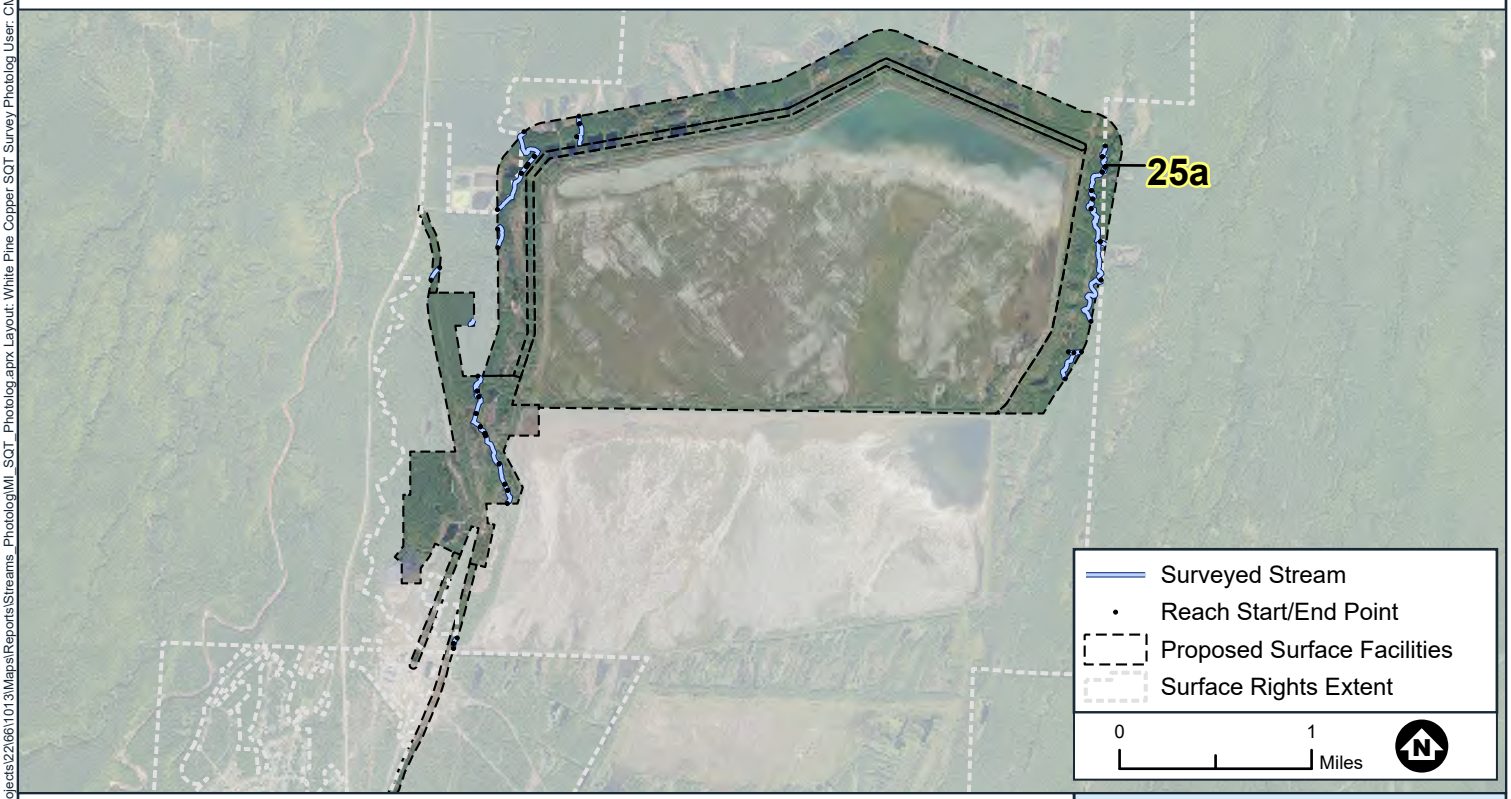
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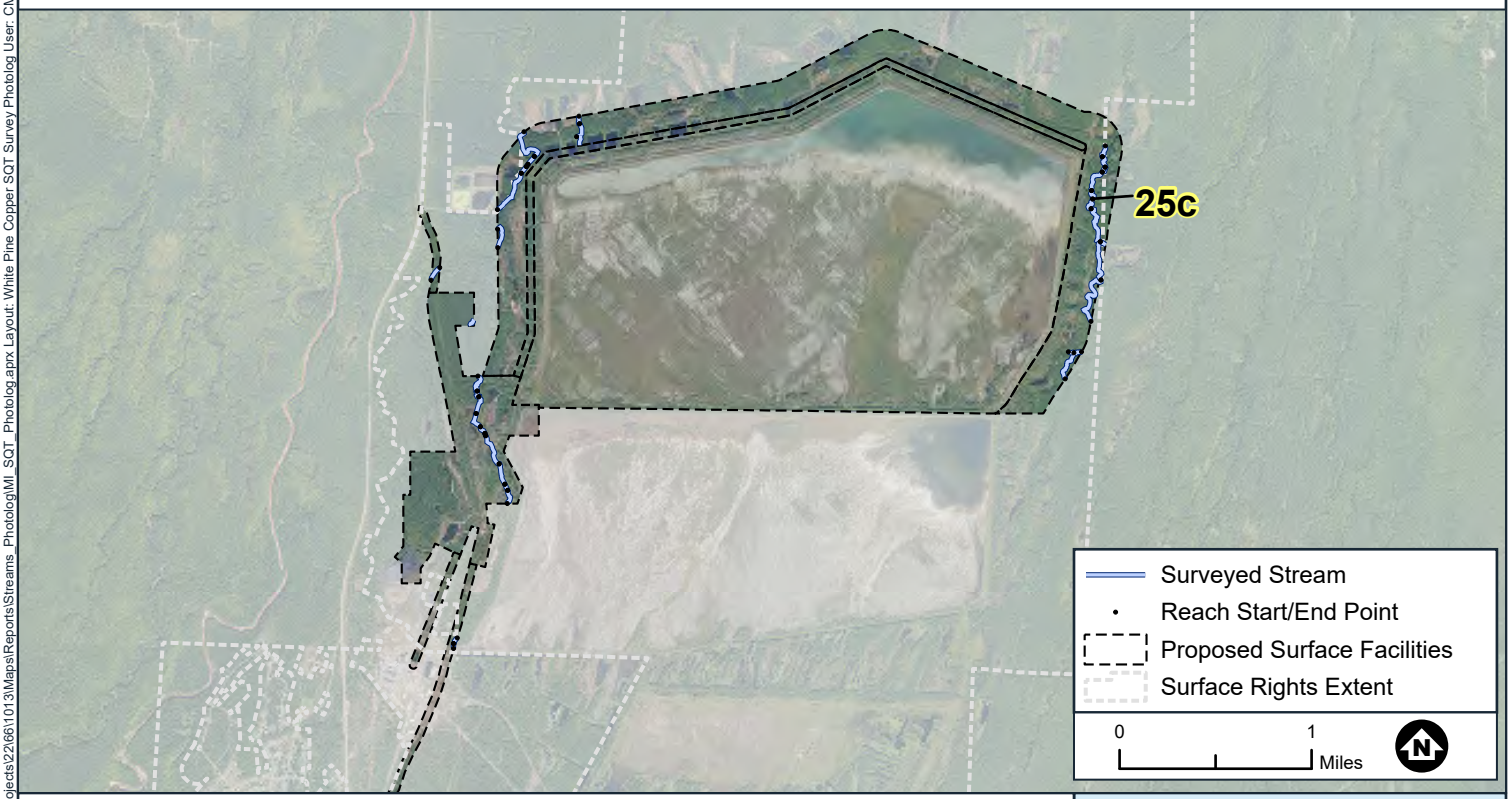
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Stream SQT Survey
Photo Log
White Pine North
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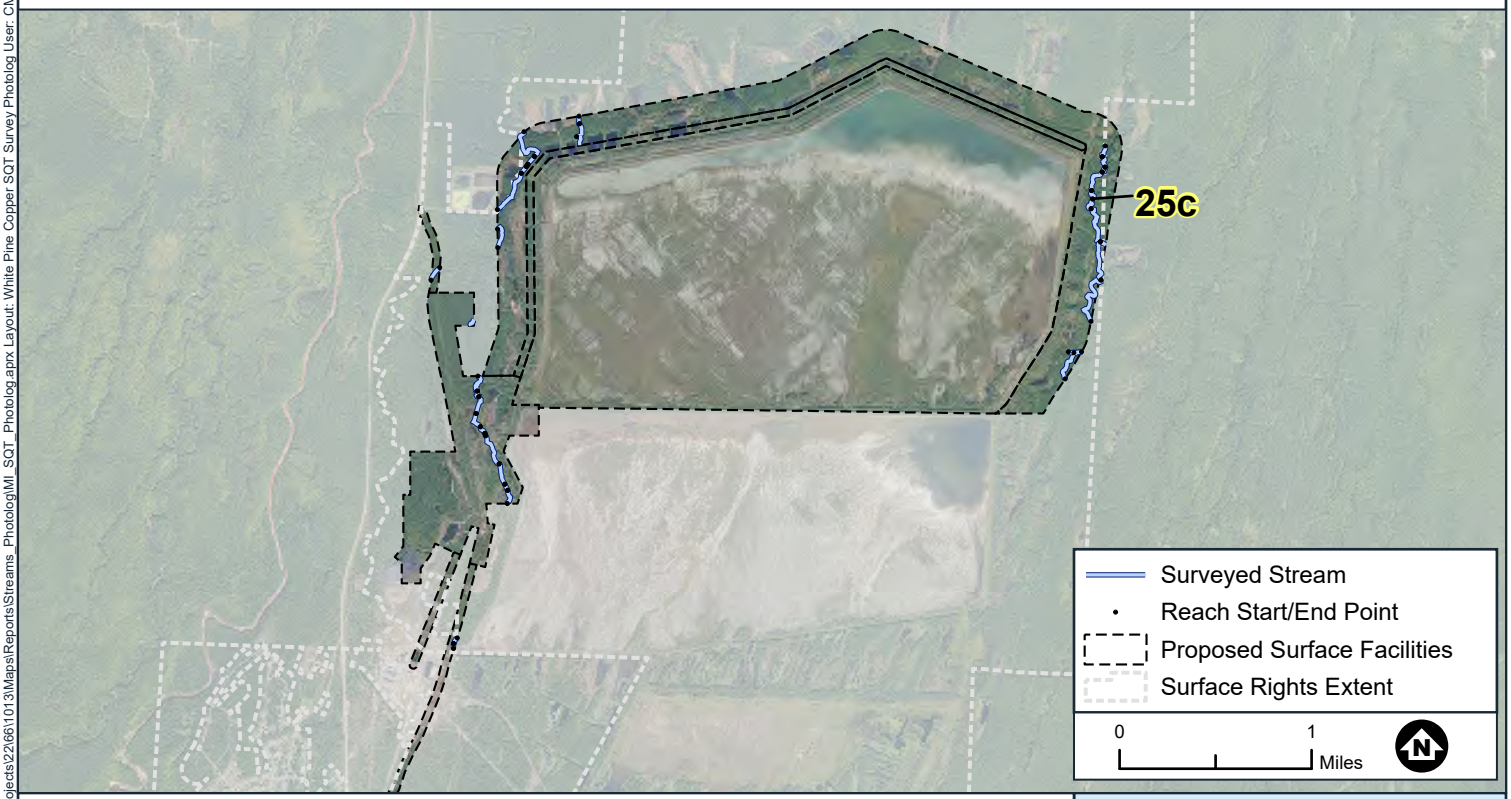
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Stream SQT Survey
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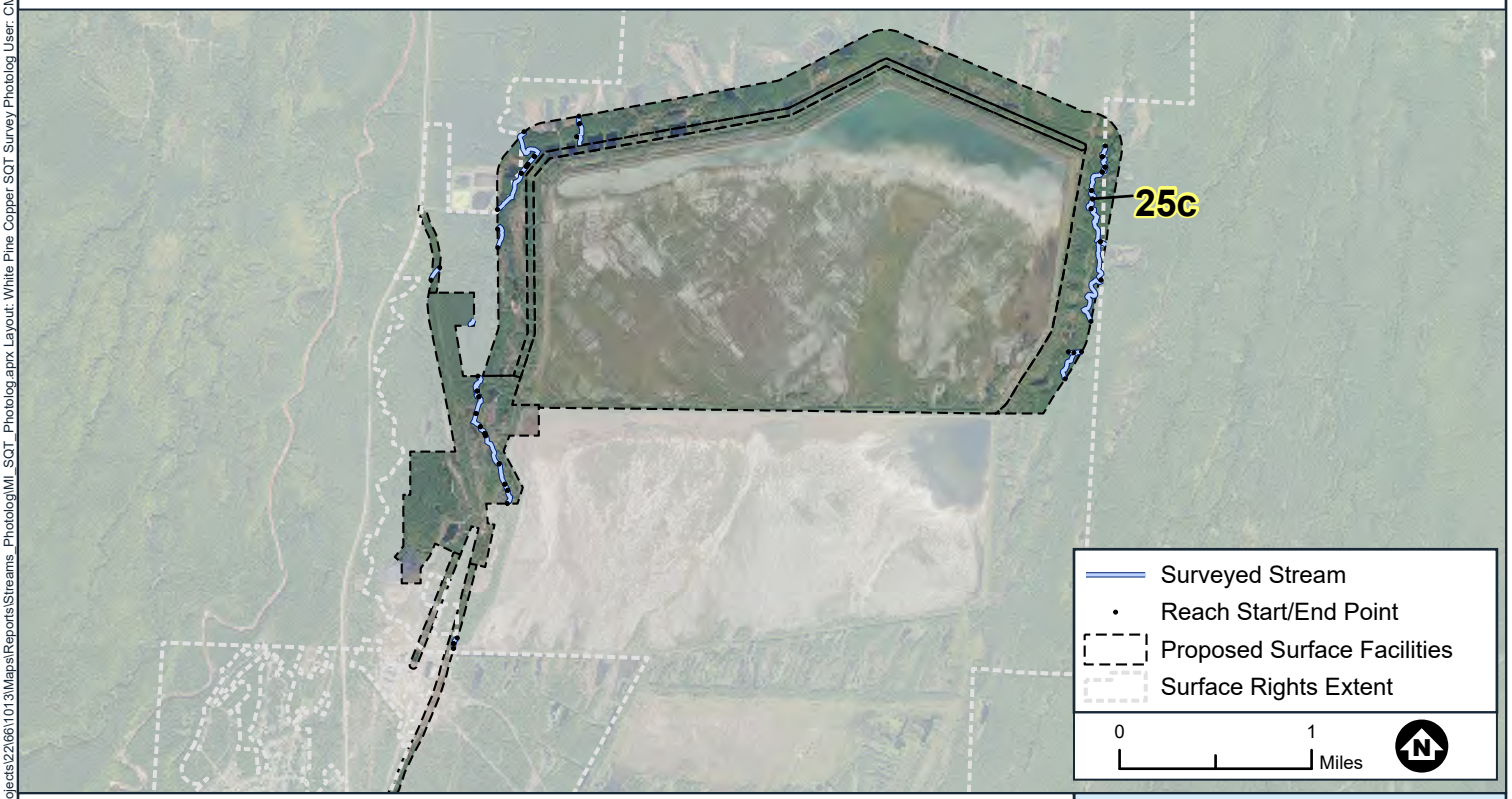
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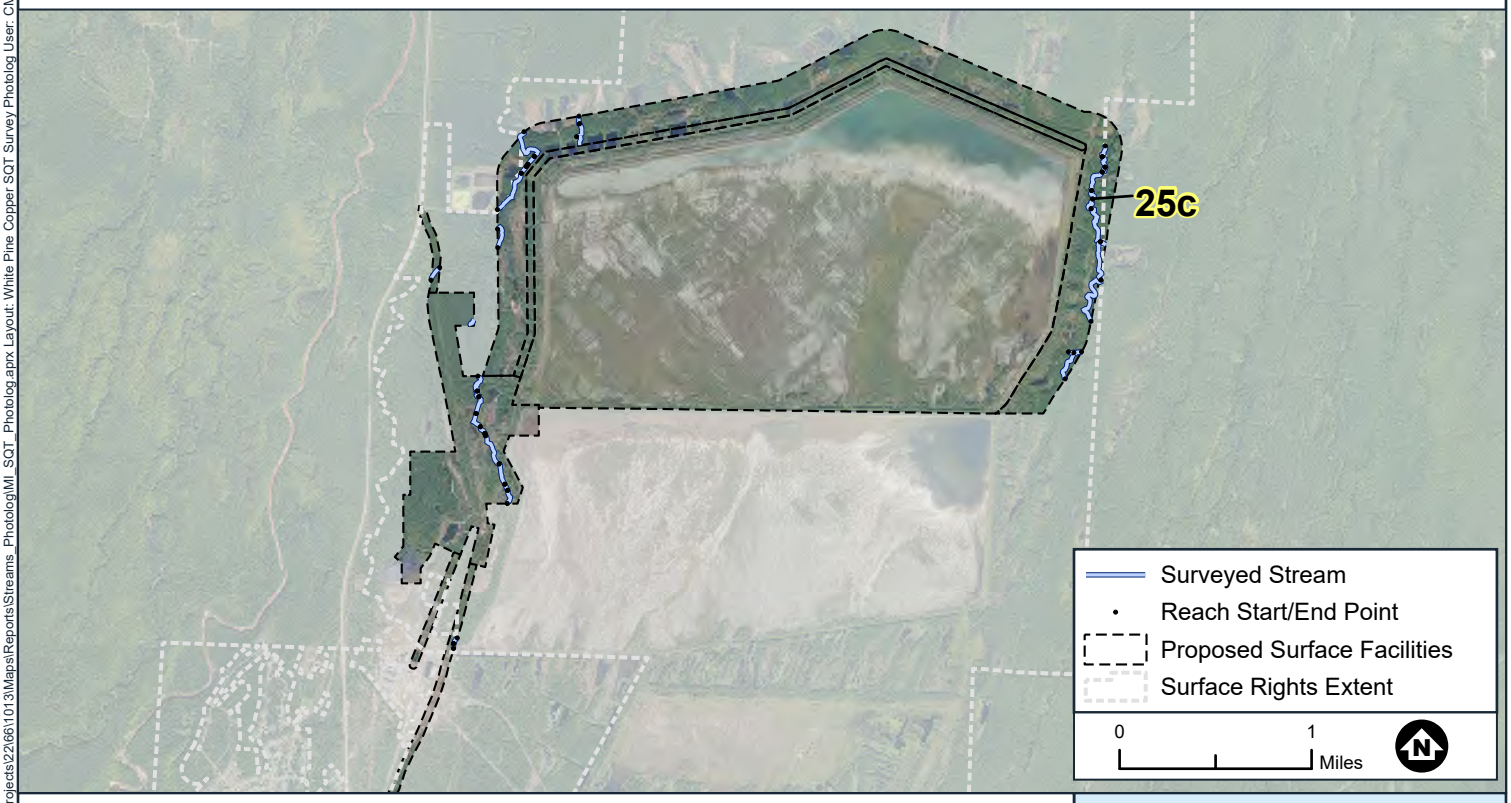
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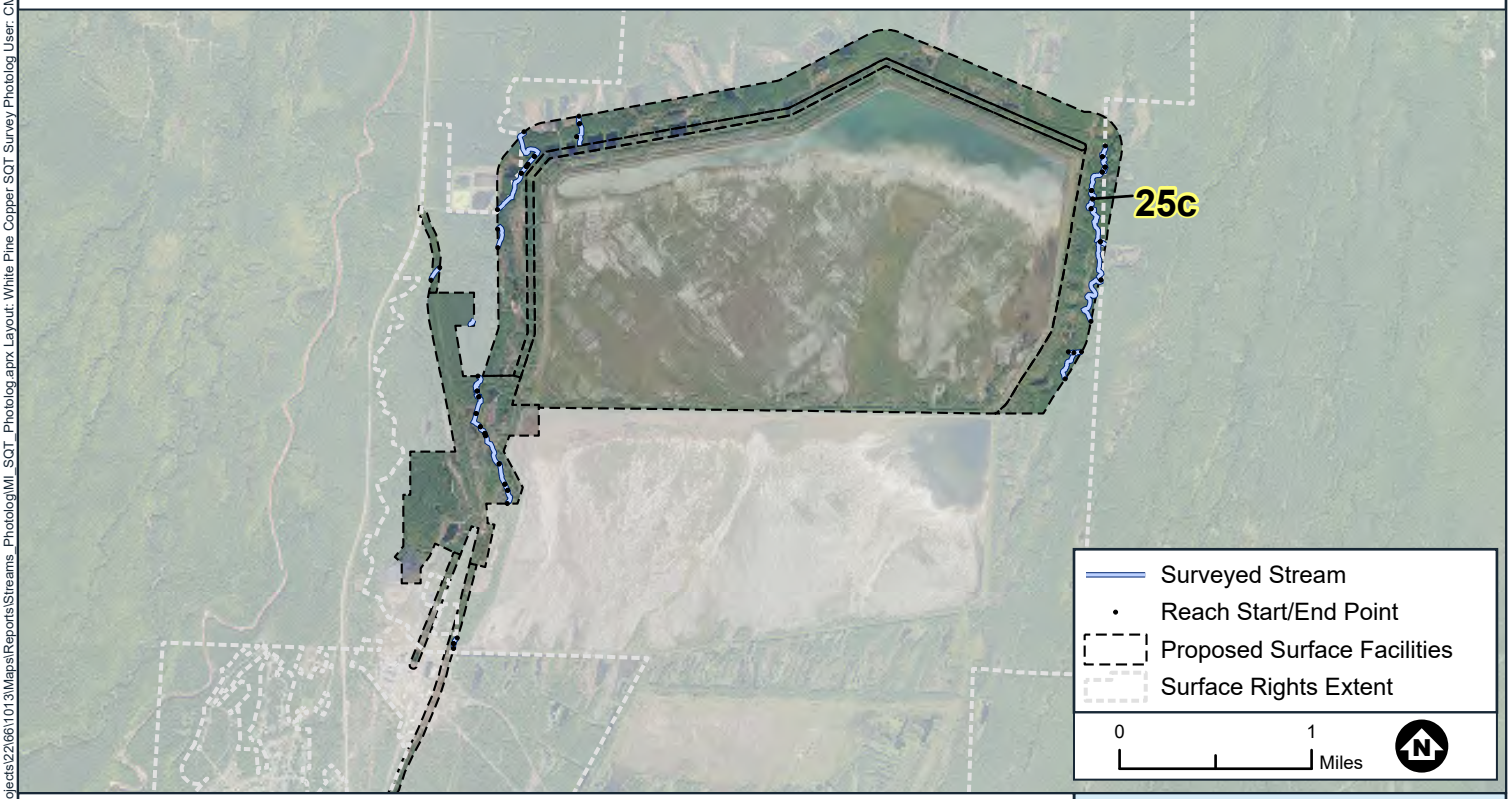
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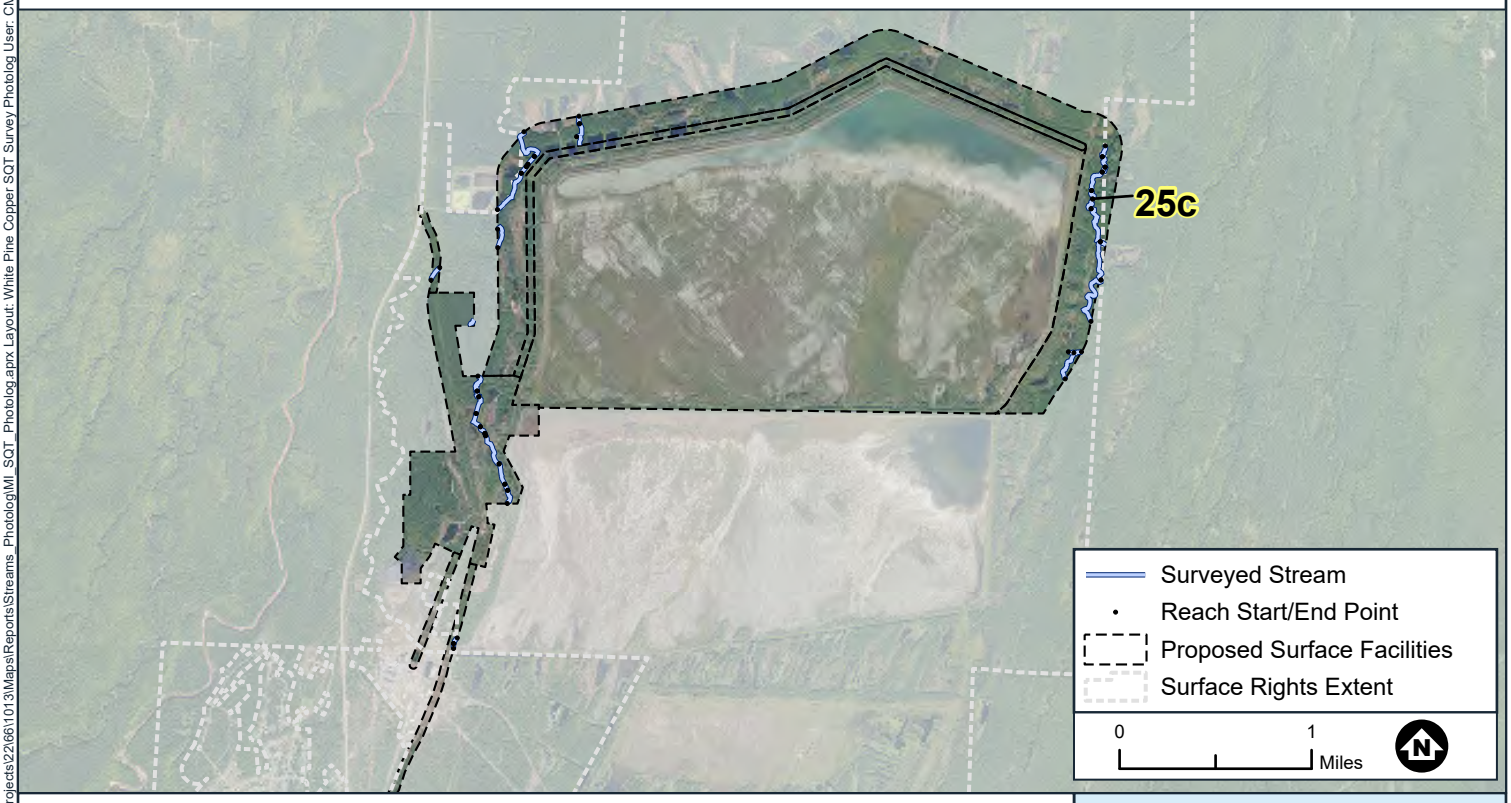
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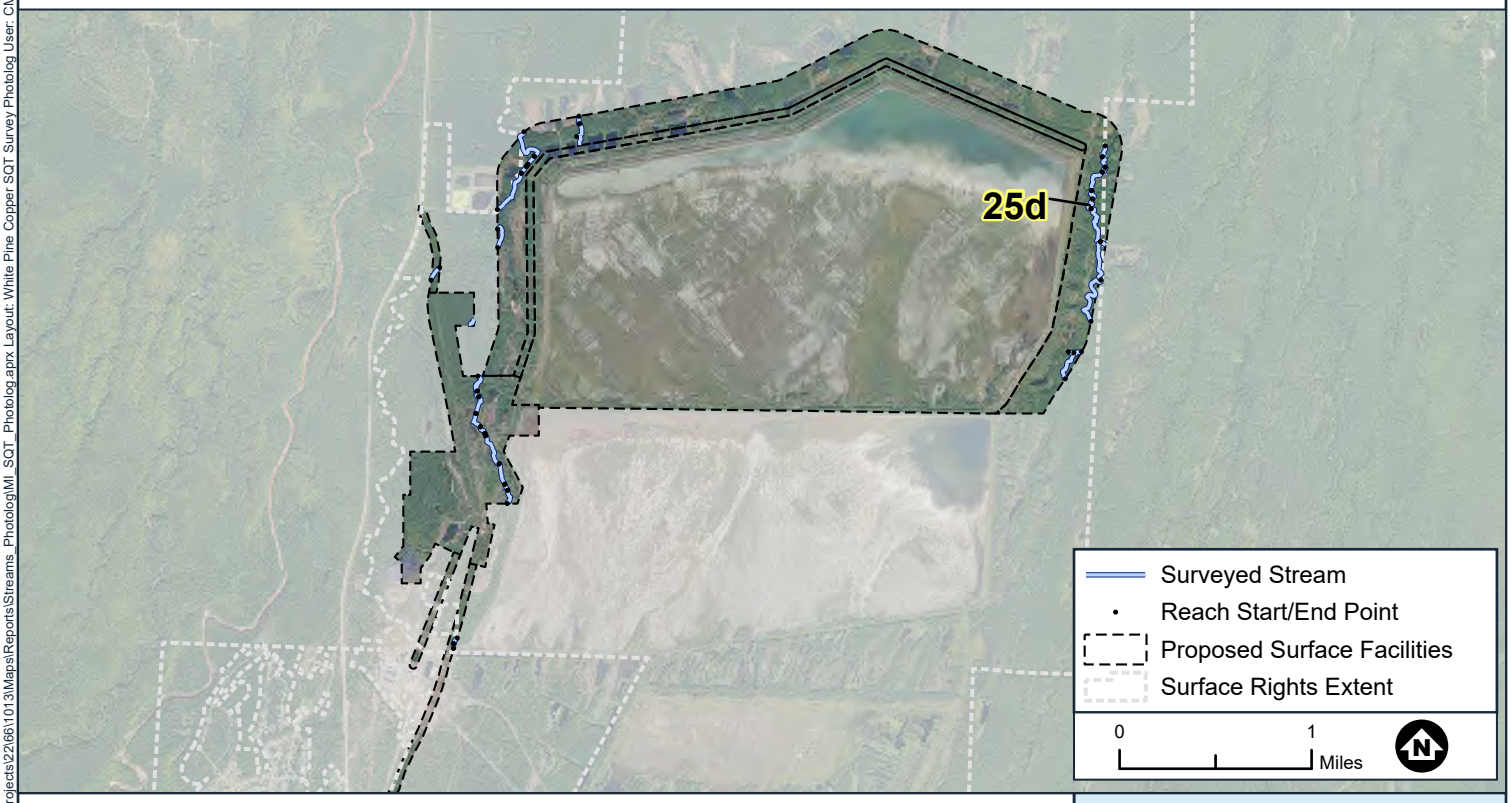
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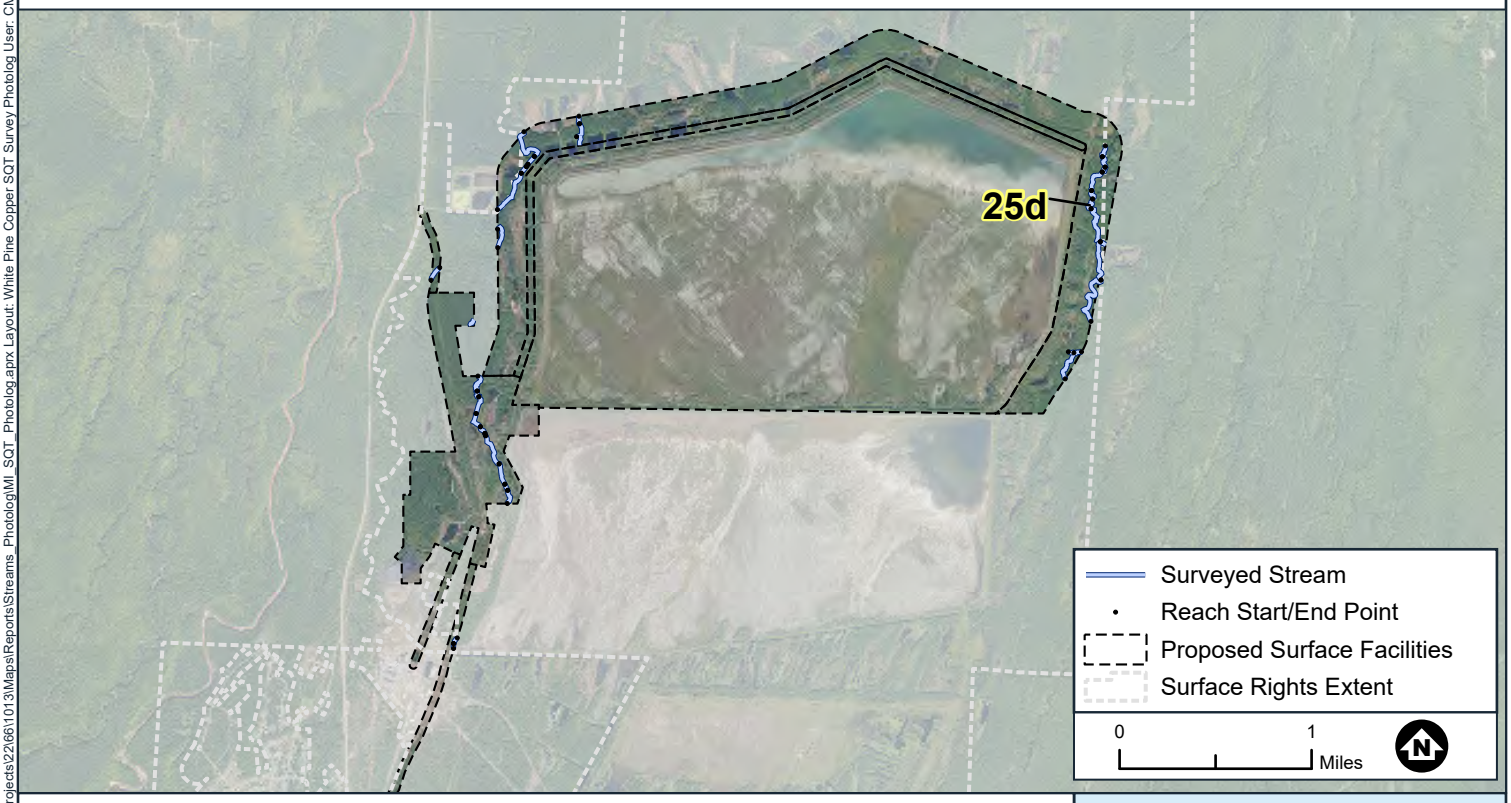
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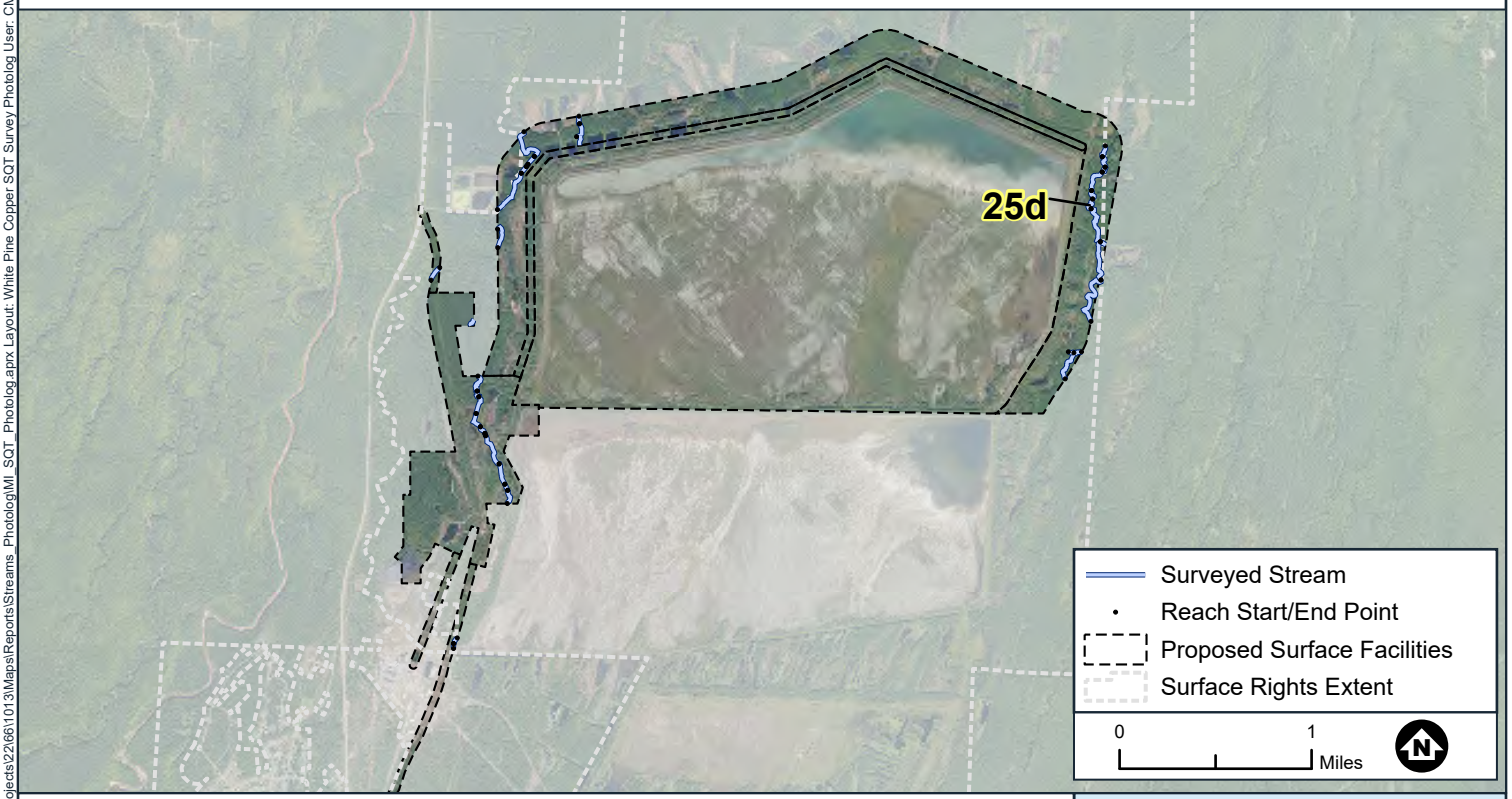
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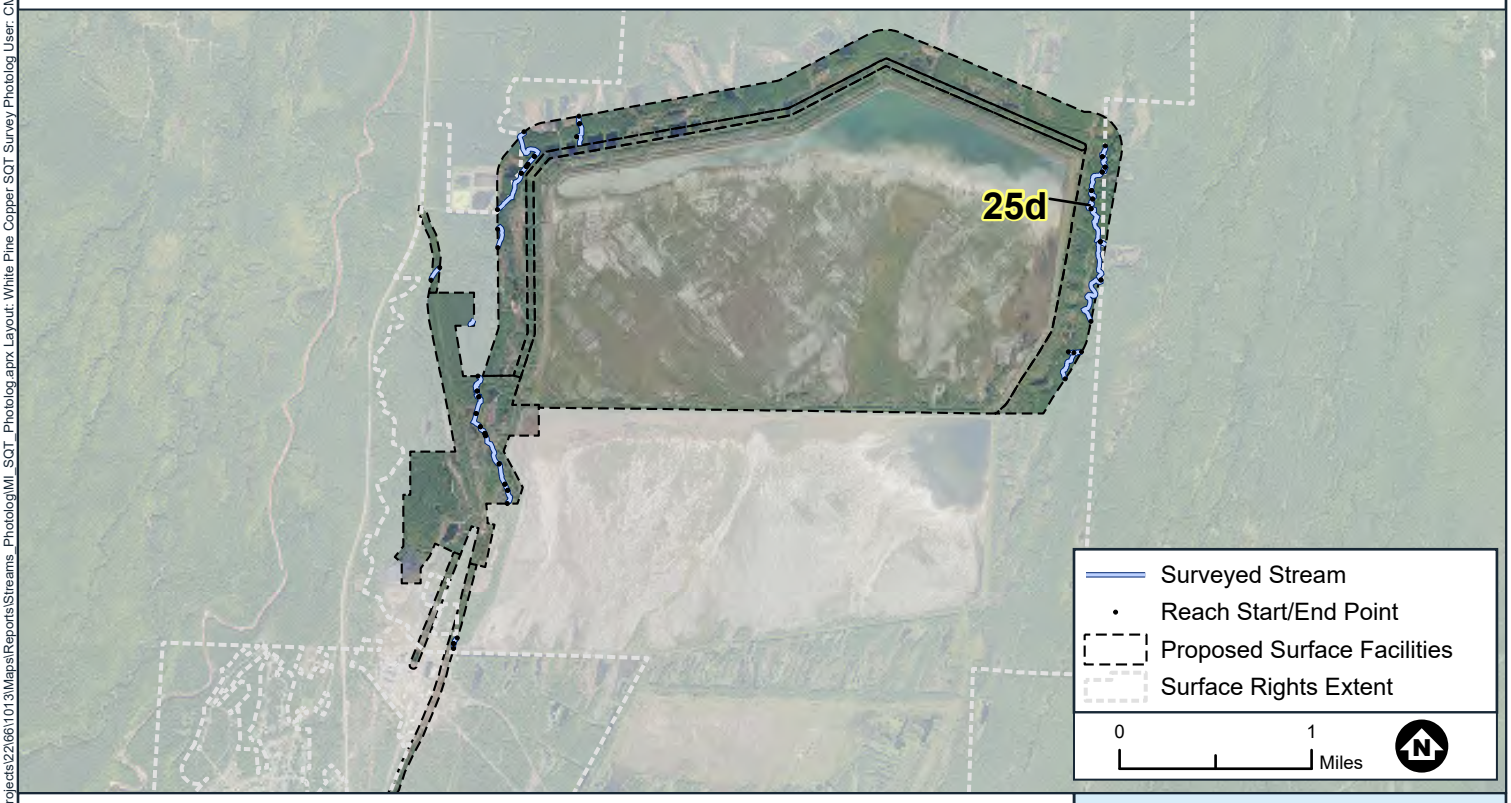
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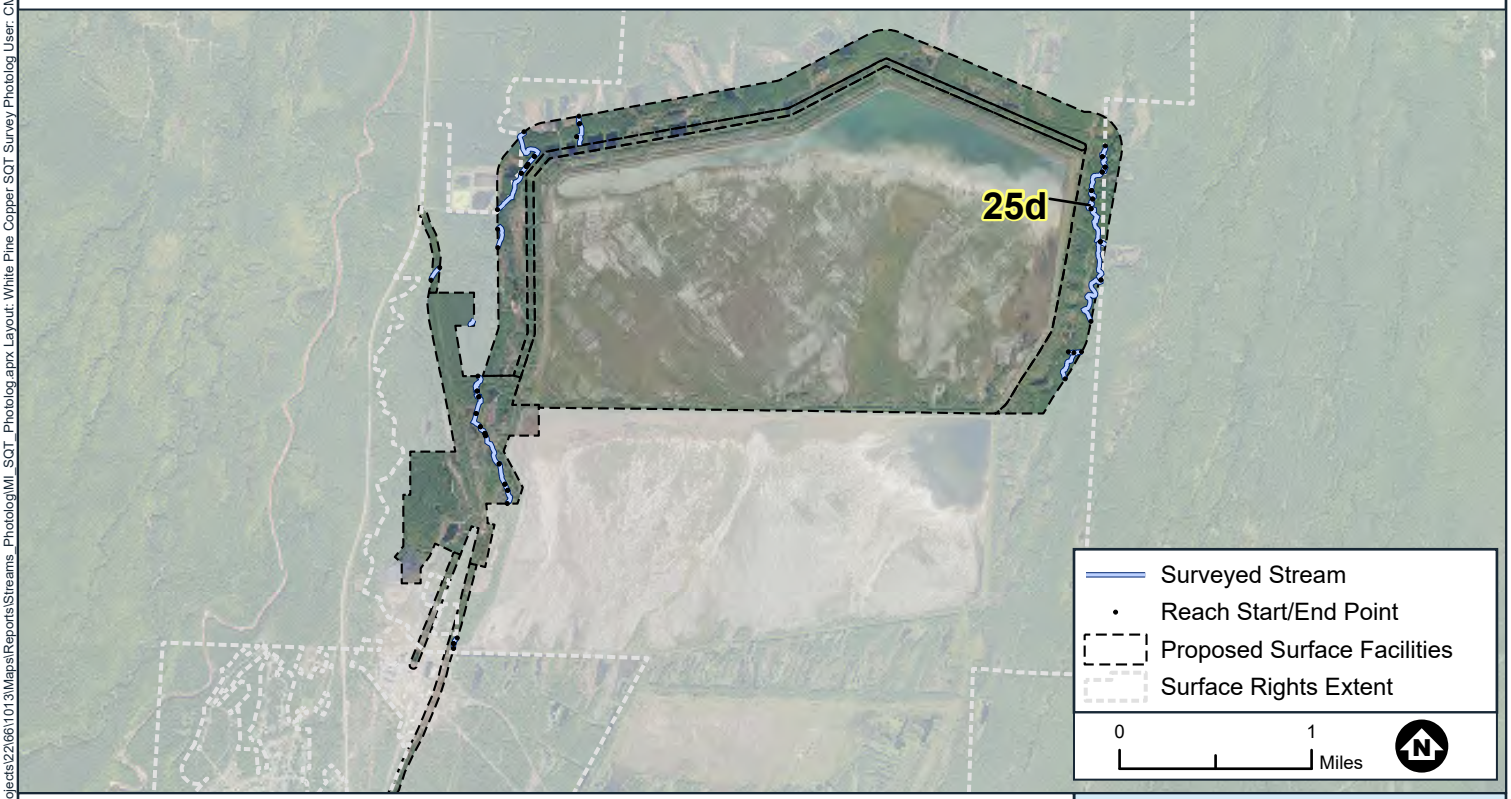
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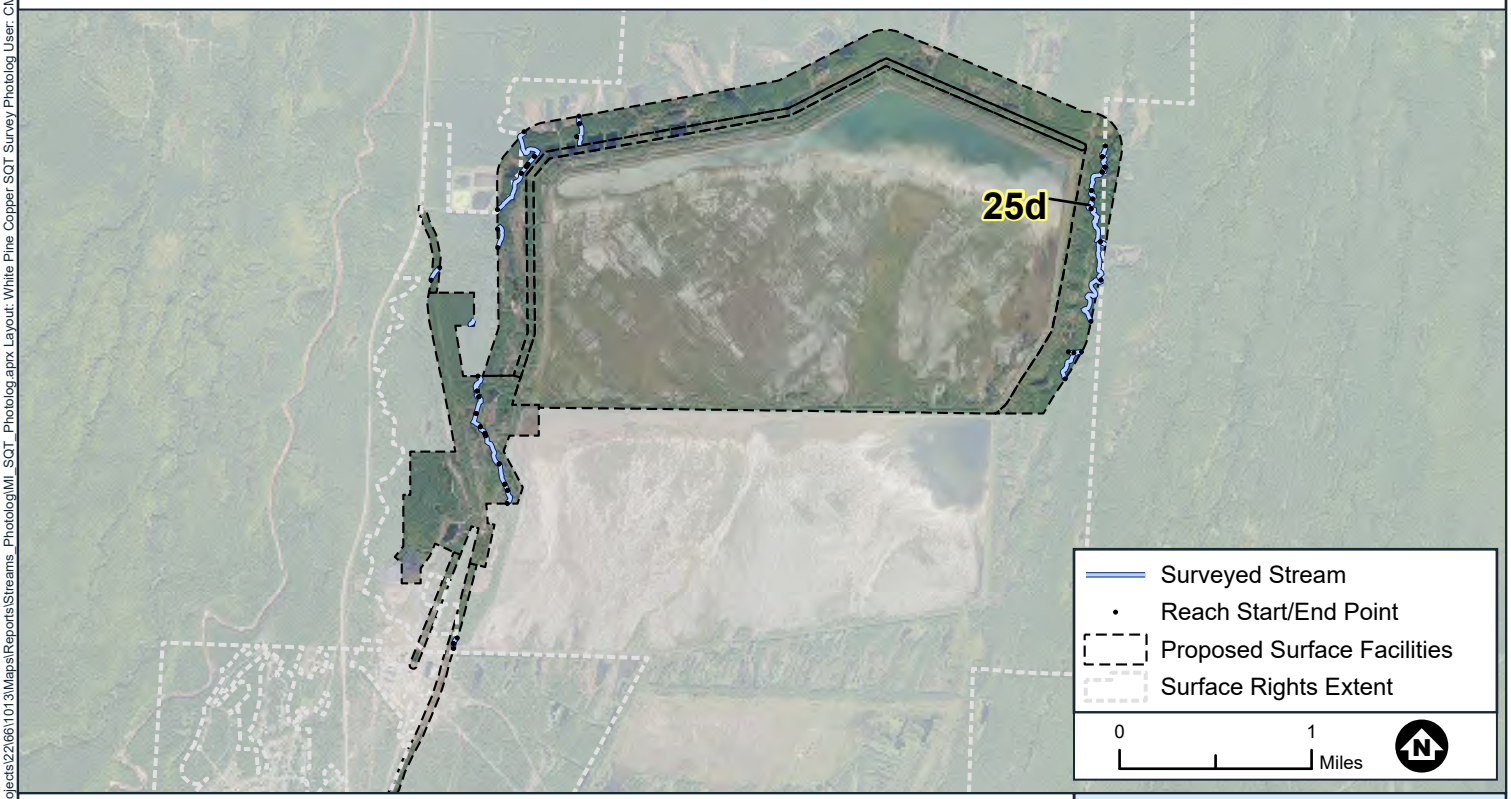
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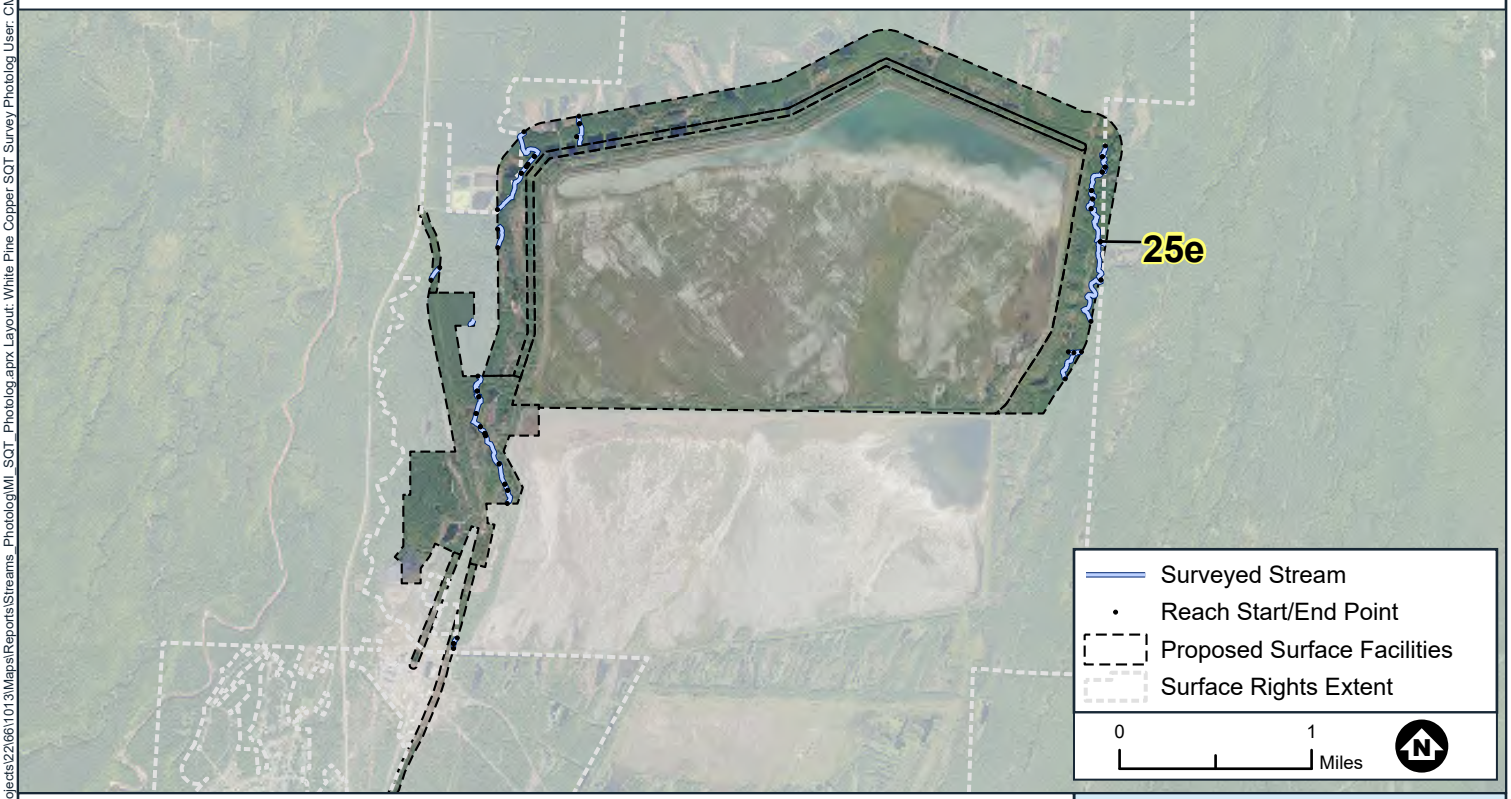
Photo caption: Streambank Assessed for Erosion

Stream SQT Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Bar Footer: ArcGISPro 3.4, 2025-01-06 15:55 File: I:\Projects\22166\1013\Maps\Reports\Streams_Photolog\MI_SQT_Photolog.aprx Layout: White Pine Copper SQT Survey Photolog User: CML3





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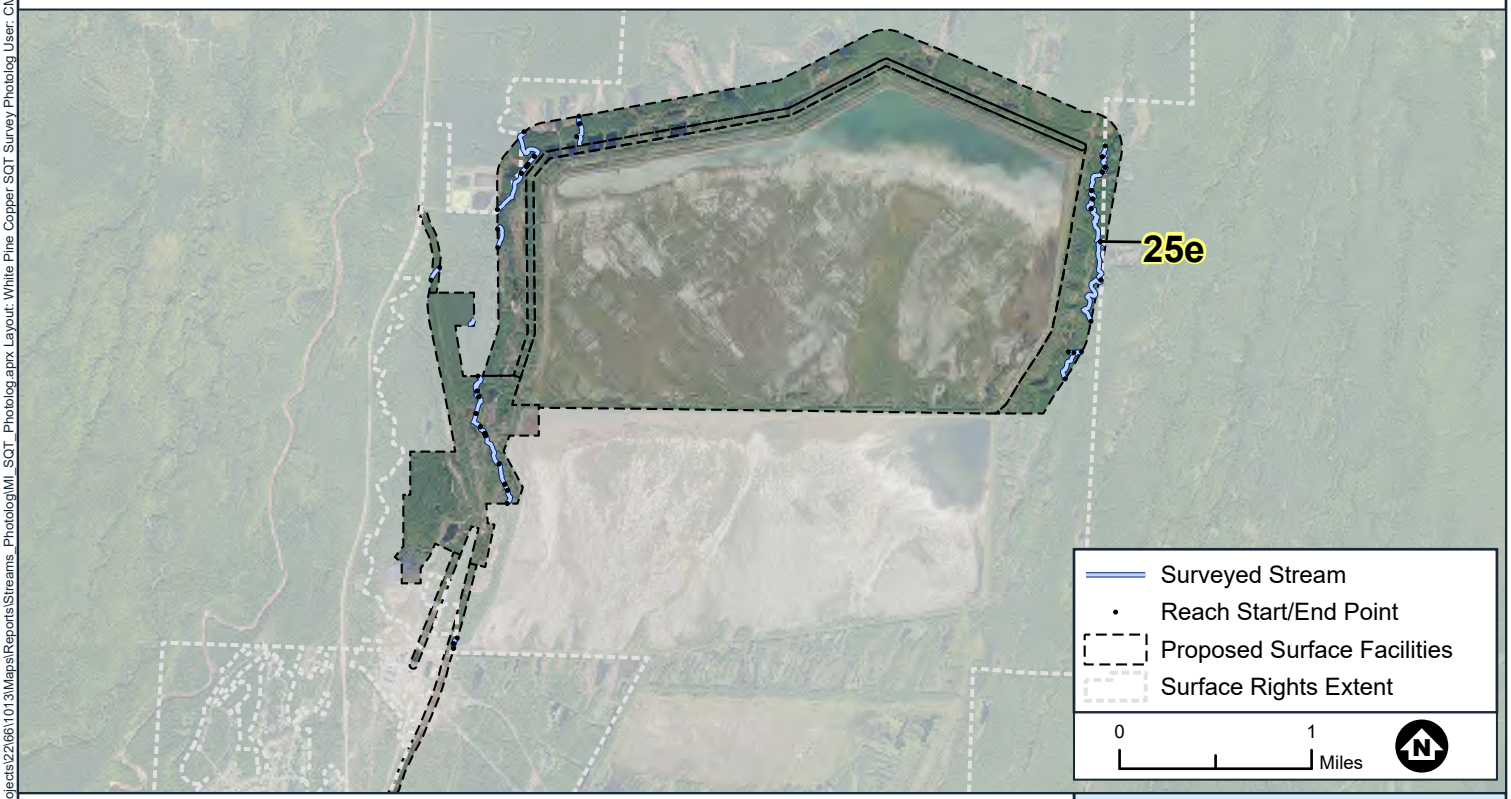
Photo caption: Start of Reach, Looking Downstream

Stream SQT Survey
Photo Log
White Pine North
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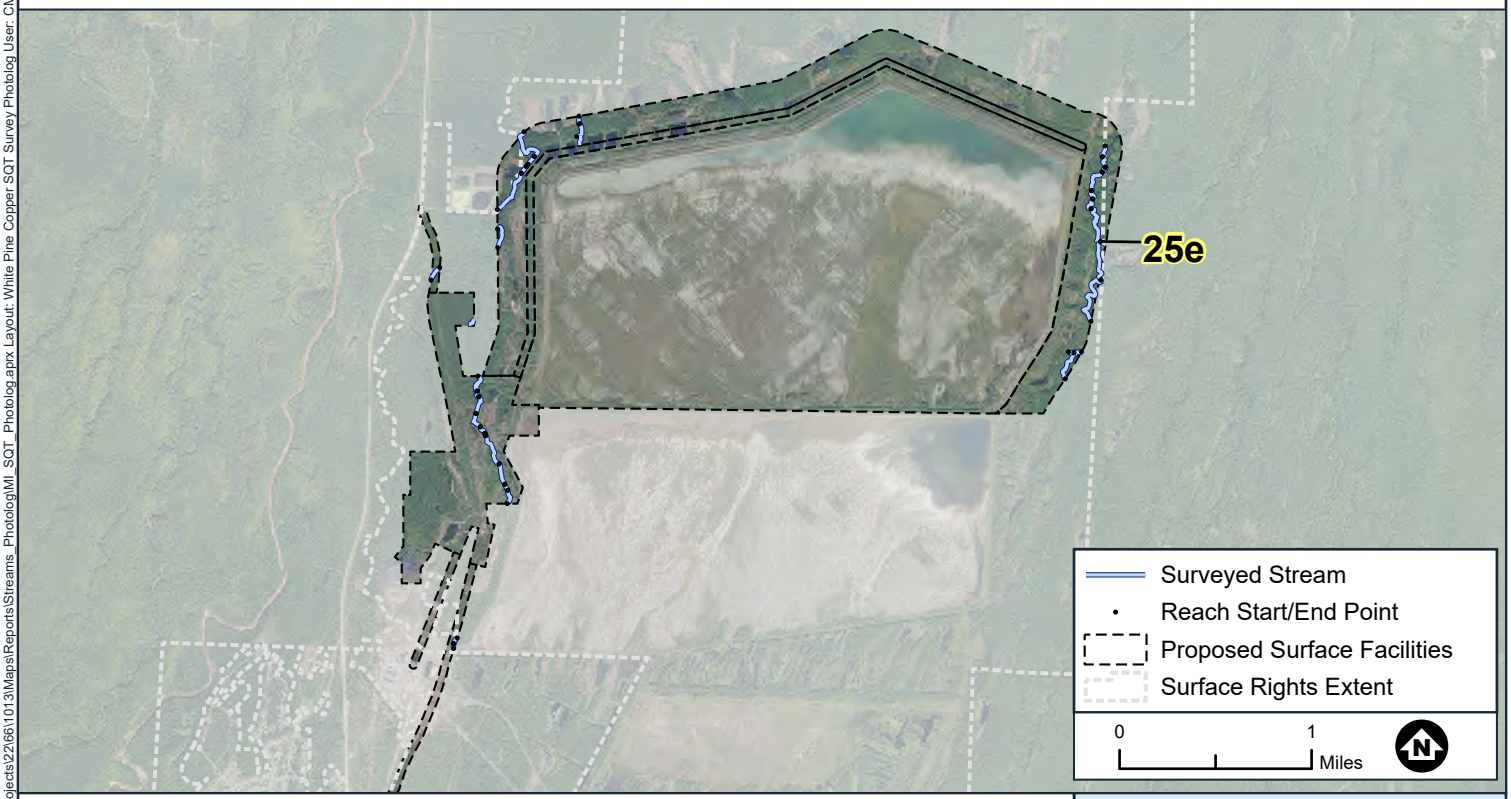
Photo caption: Representative Riffle Cross Section

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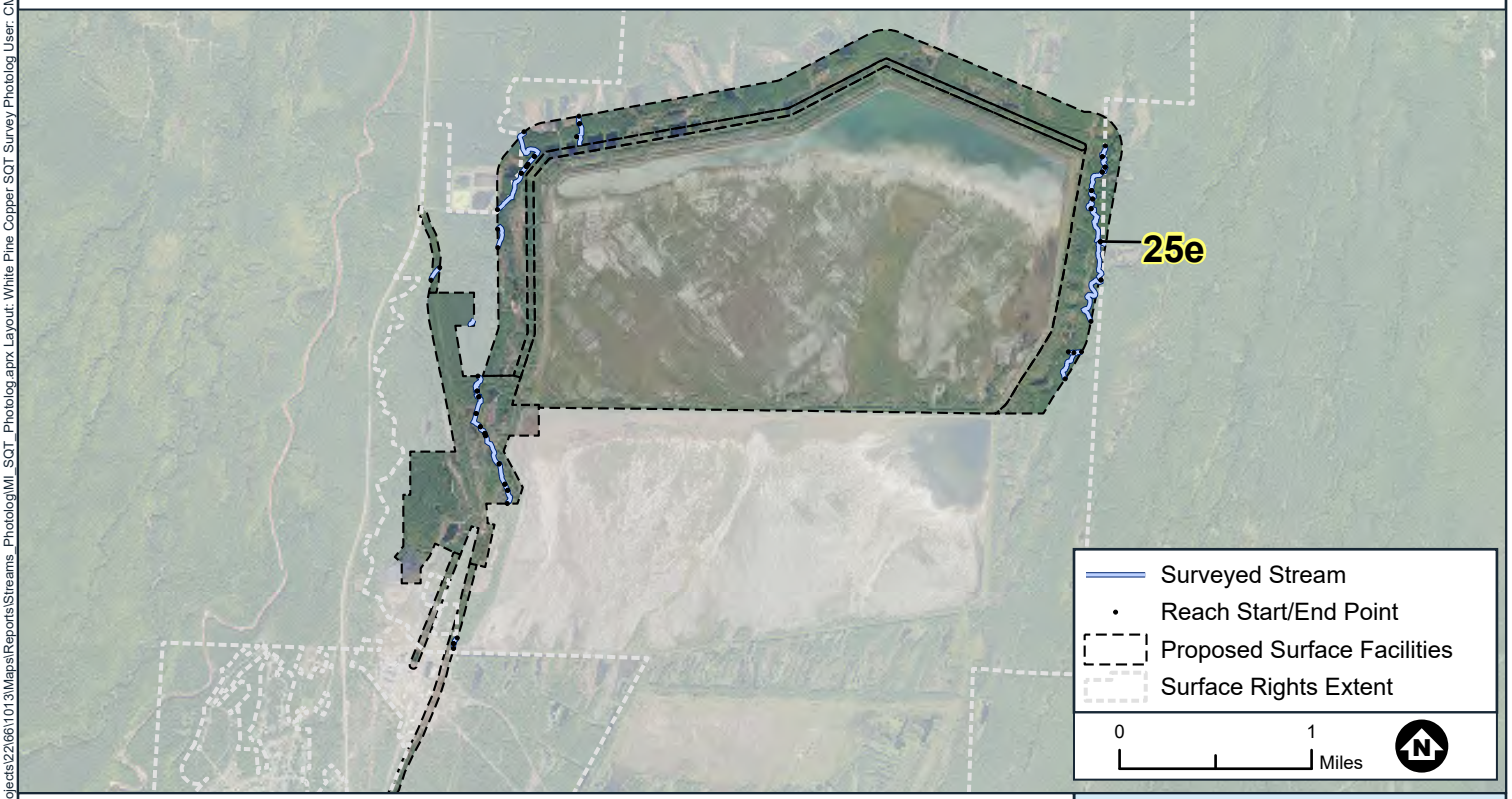
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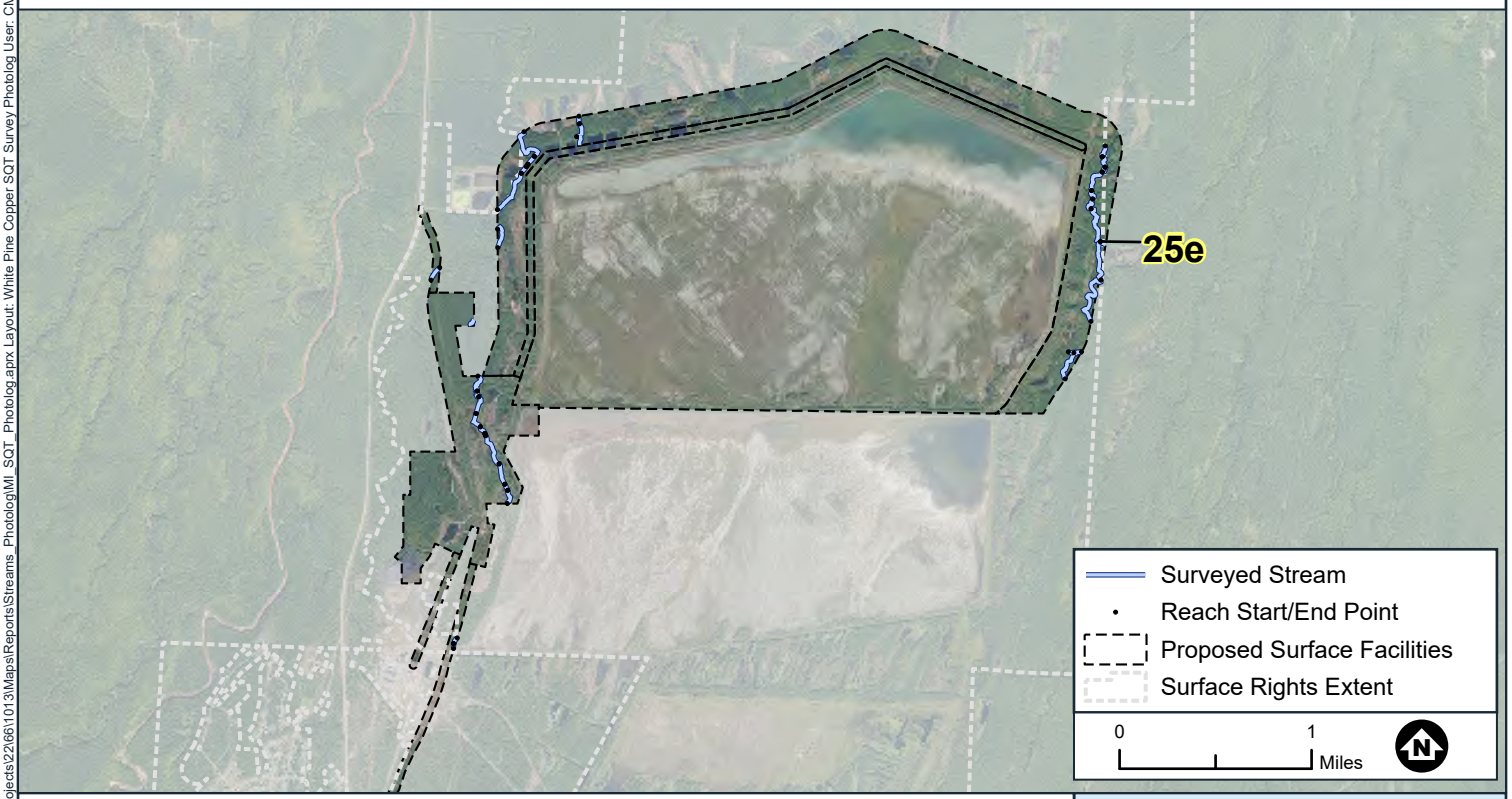
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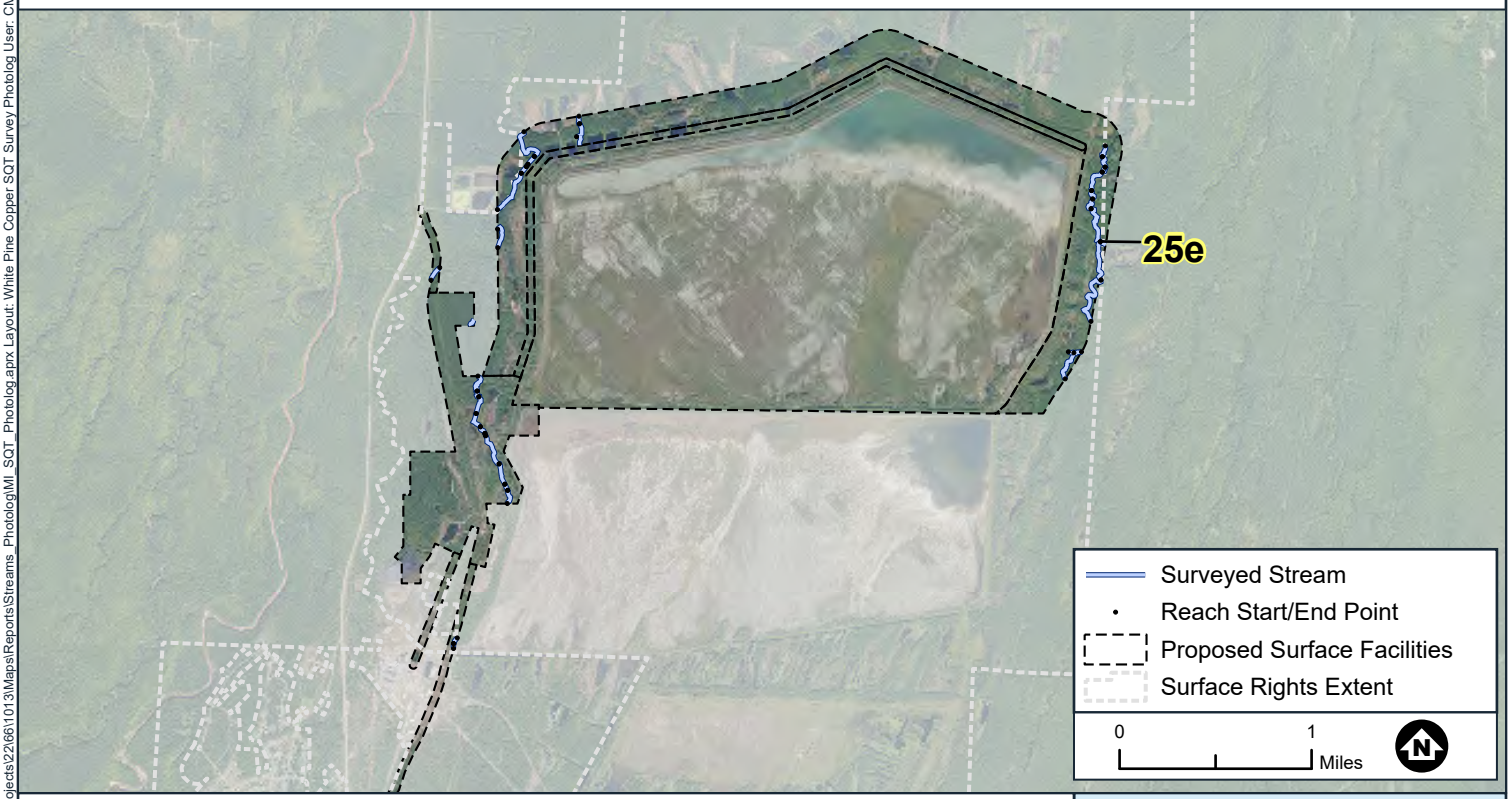
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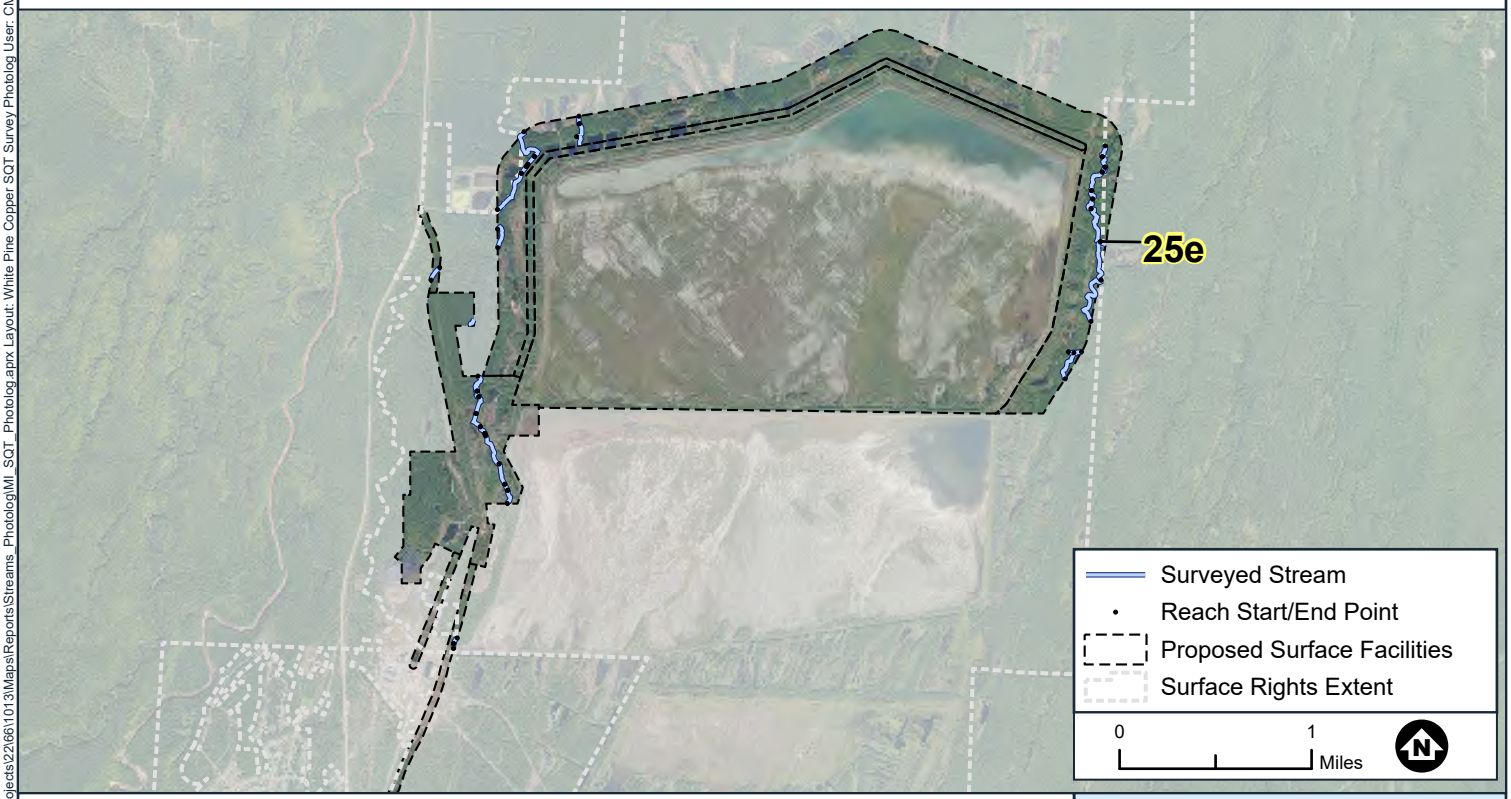
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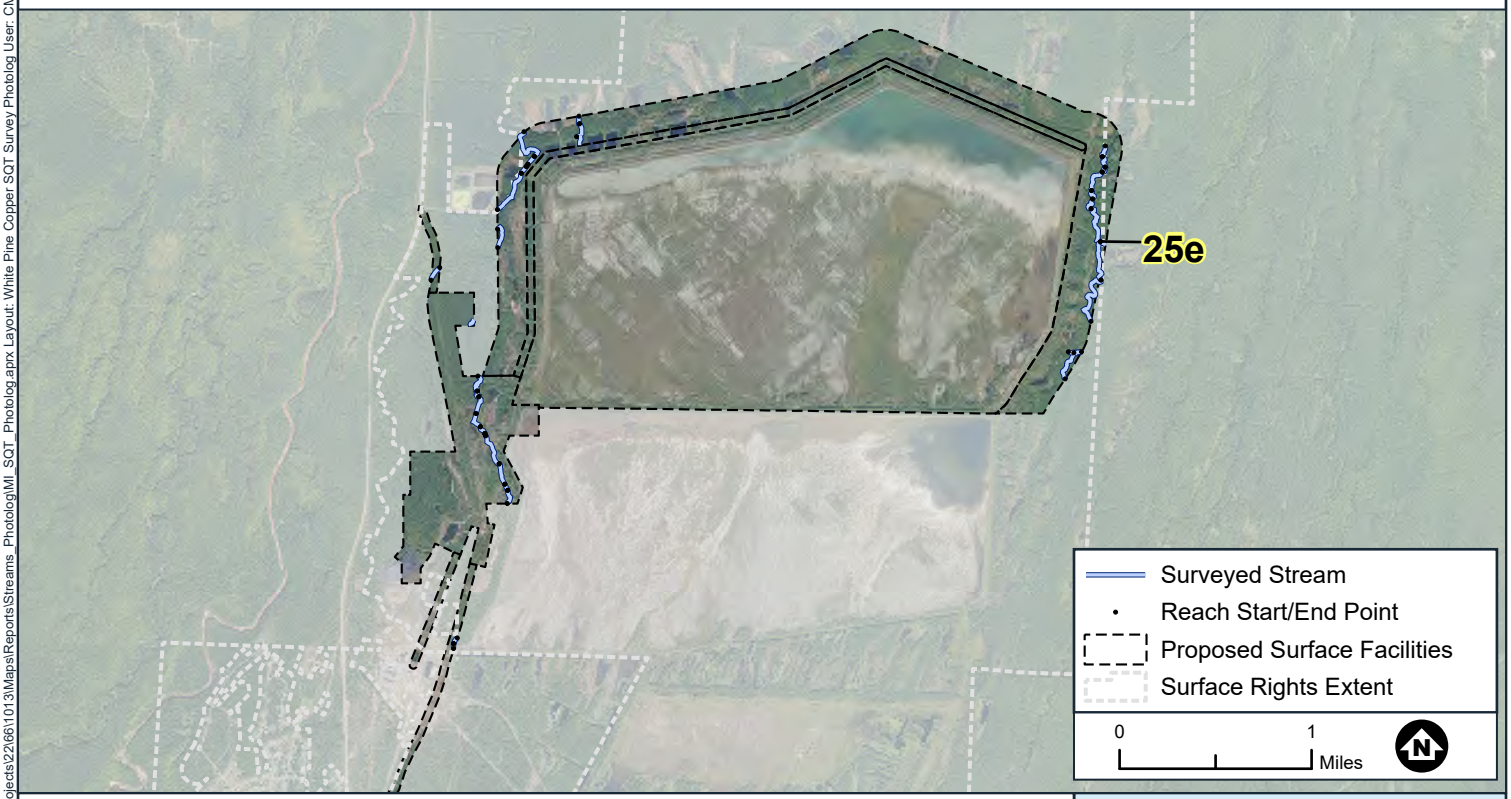
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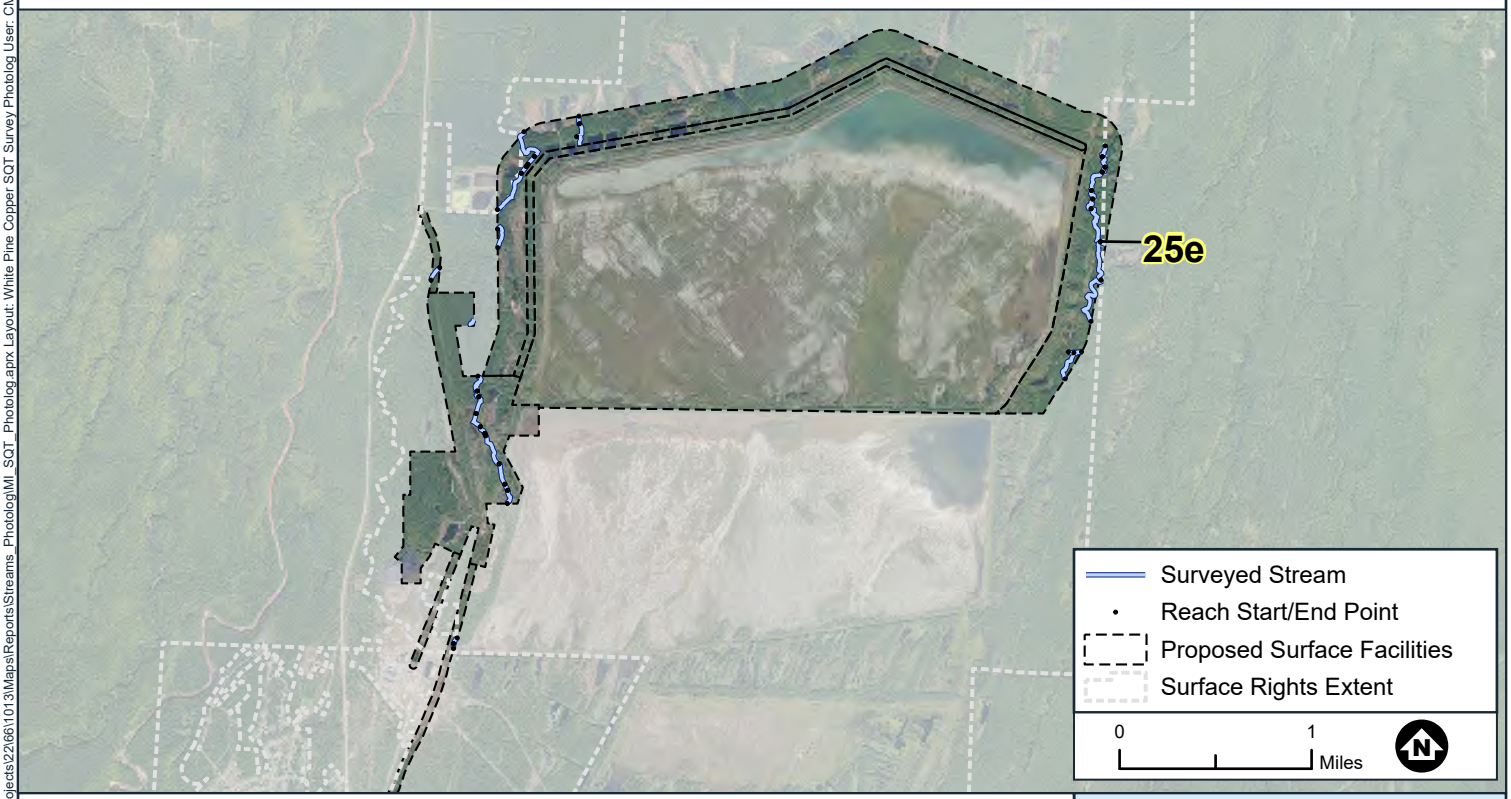
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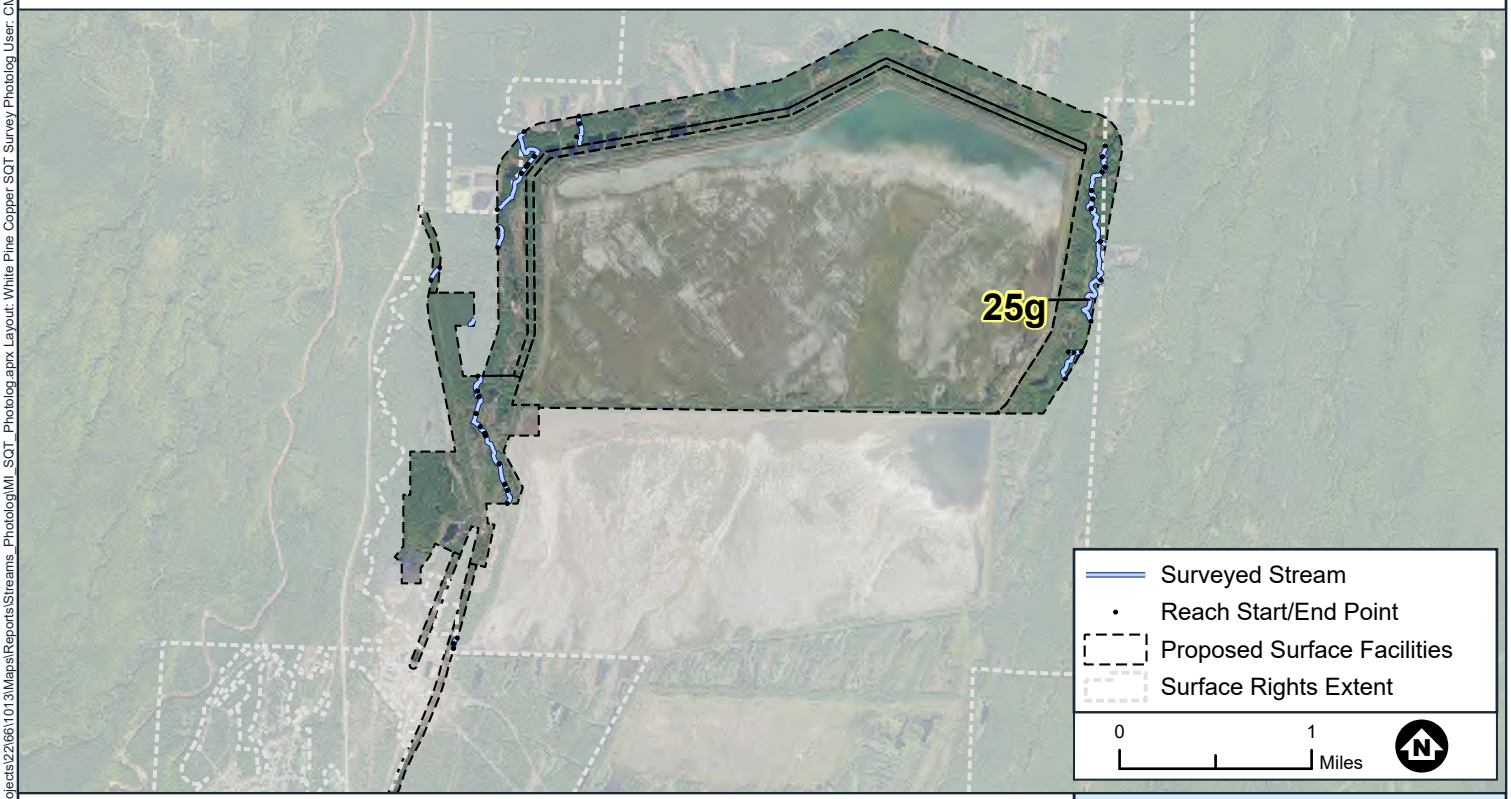
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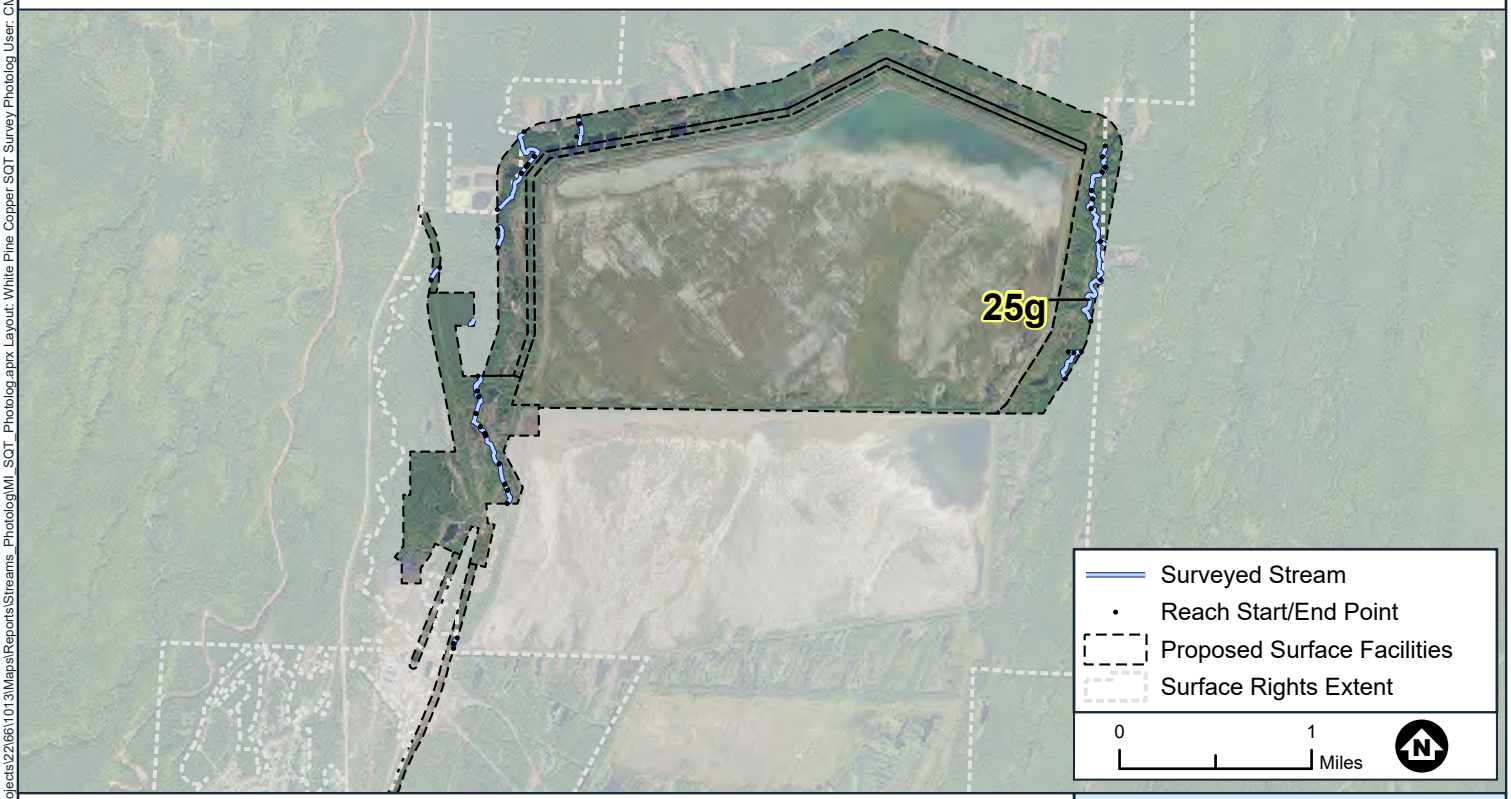
Photo caption: Representative Riffle Cross Section

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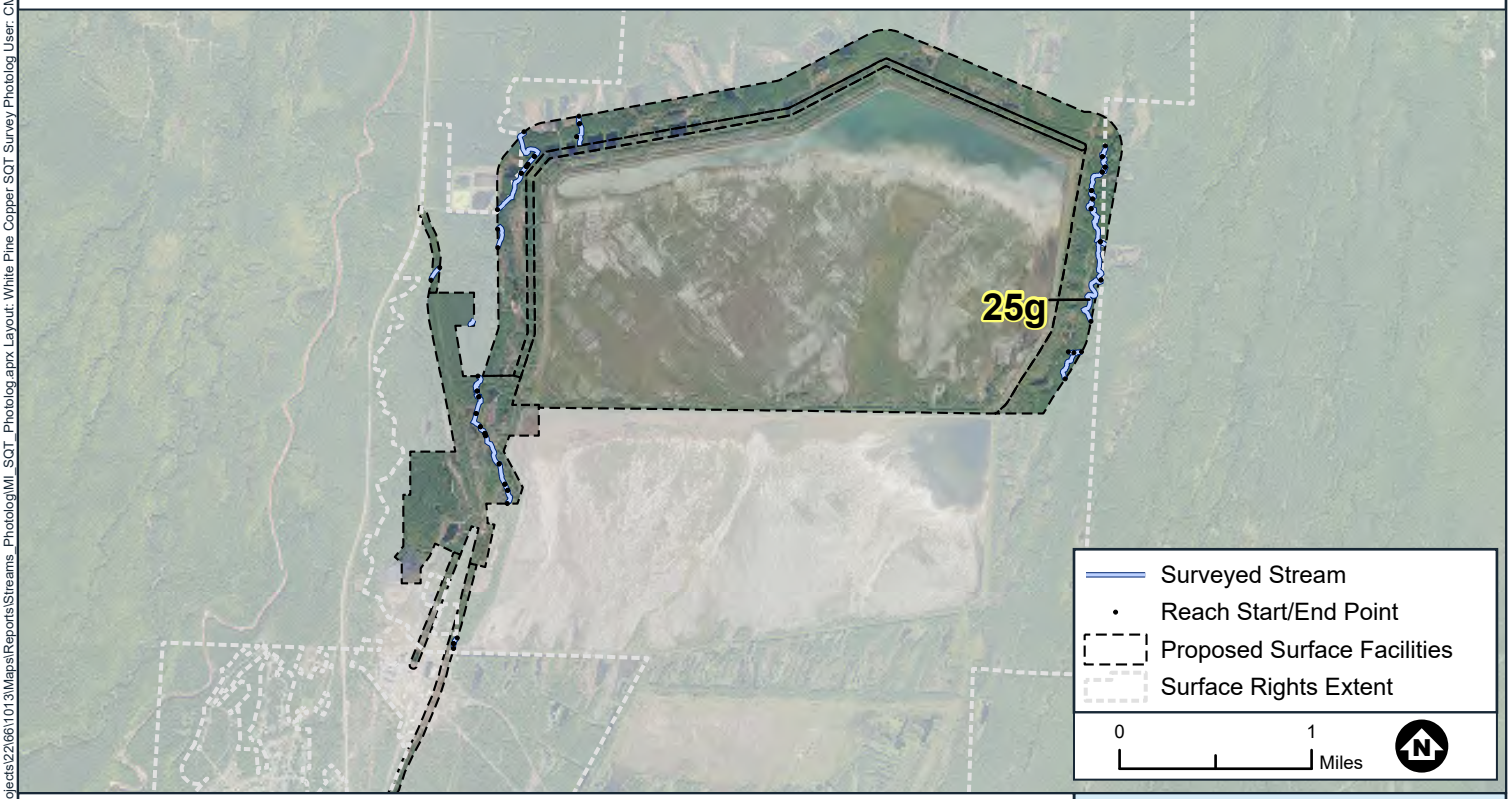
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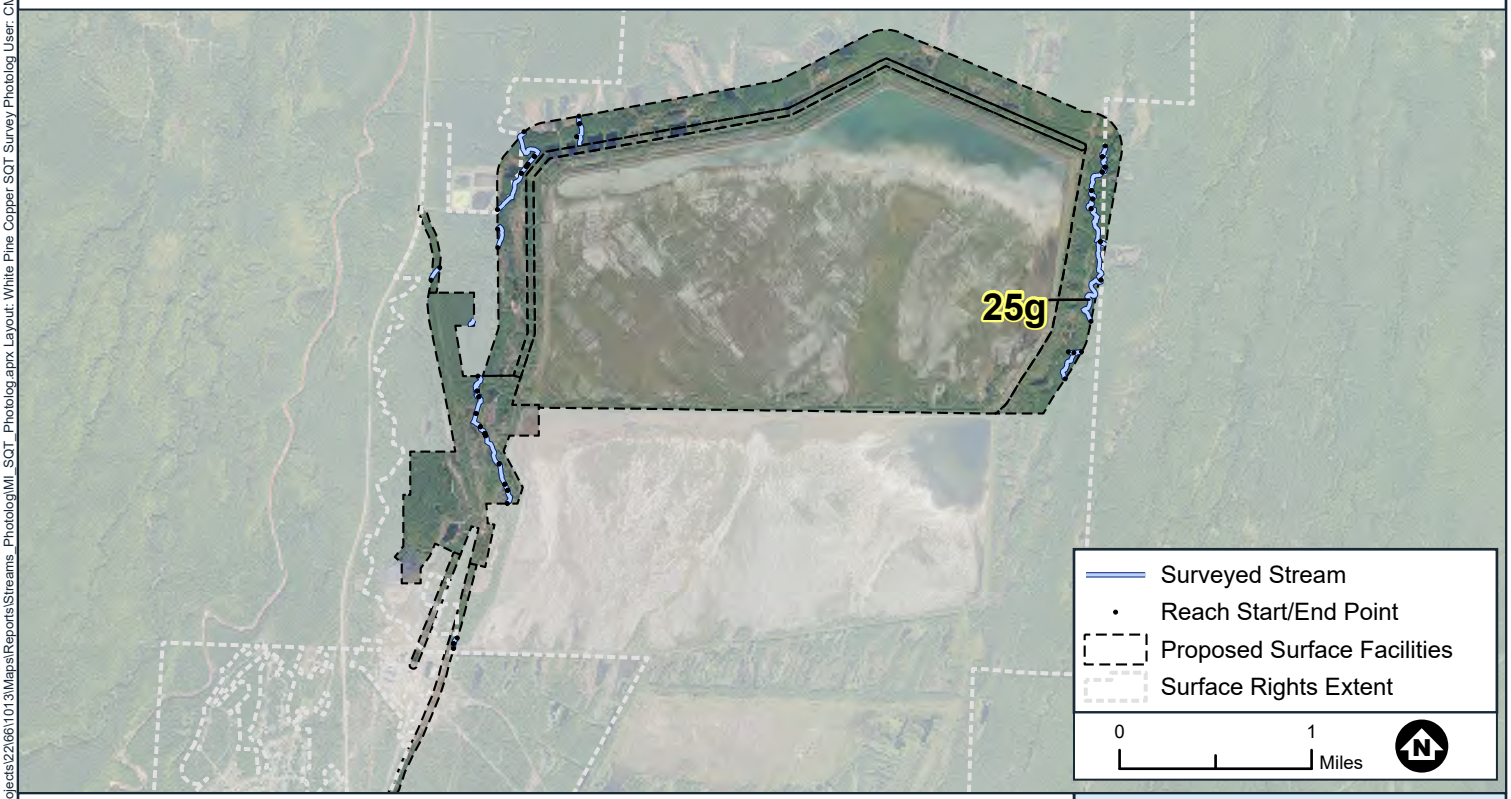
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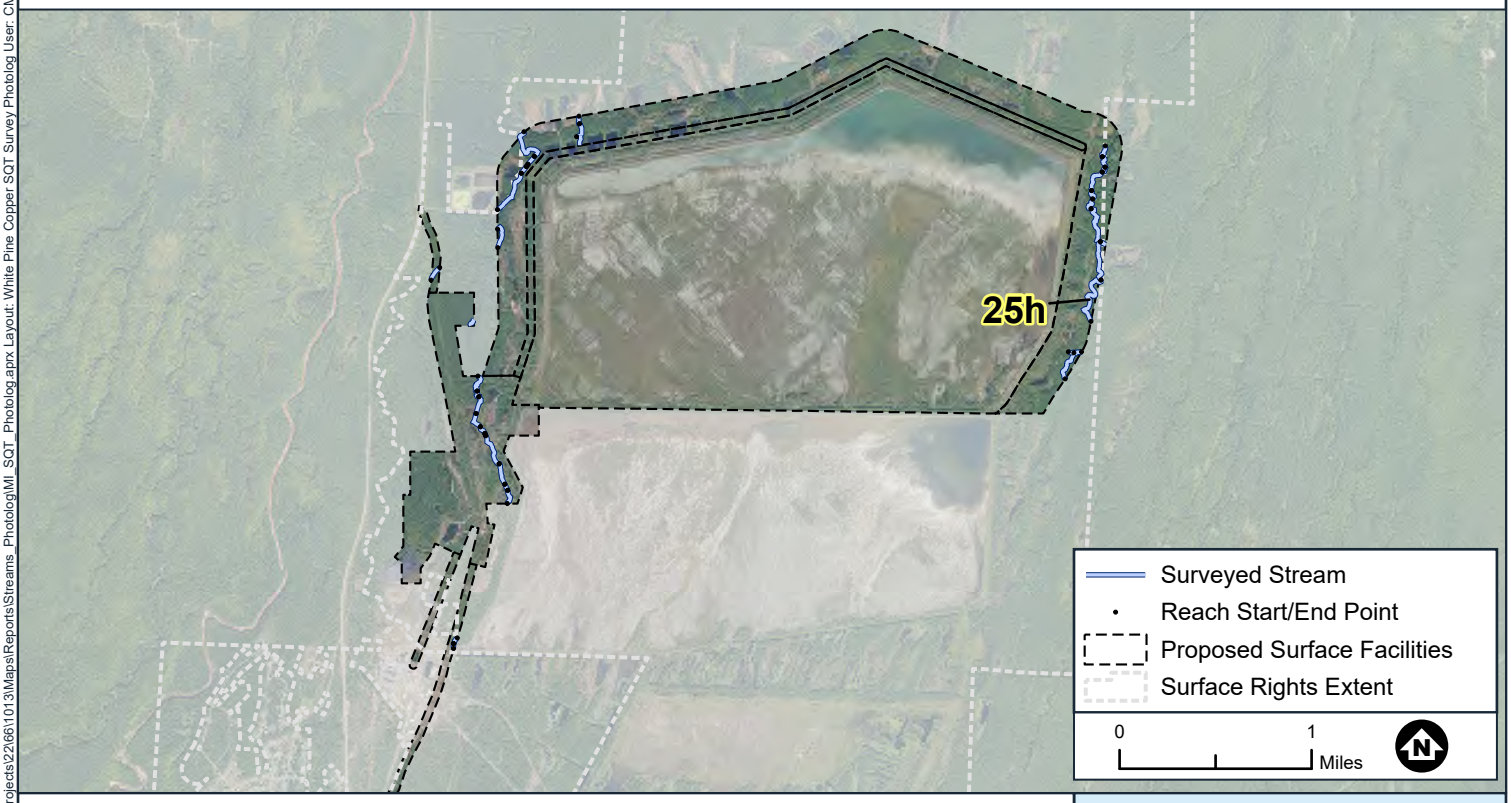
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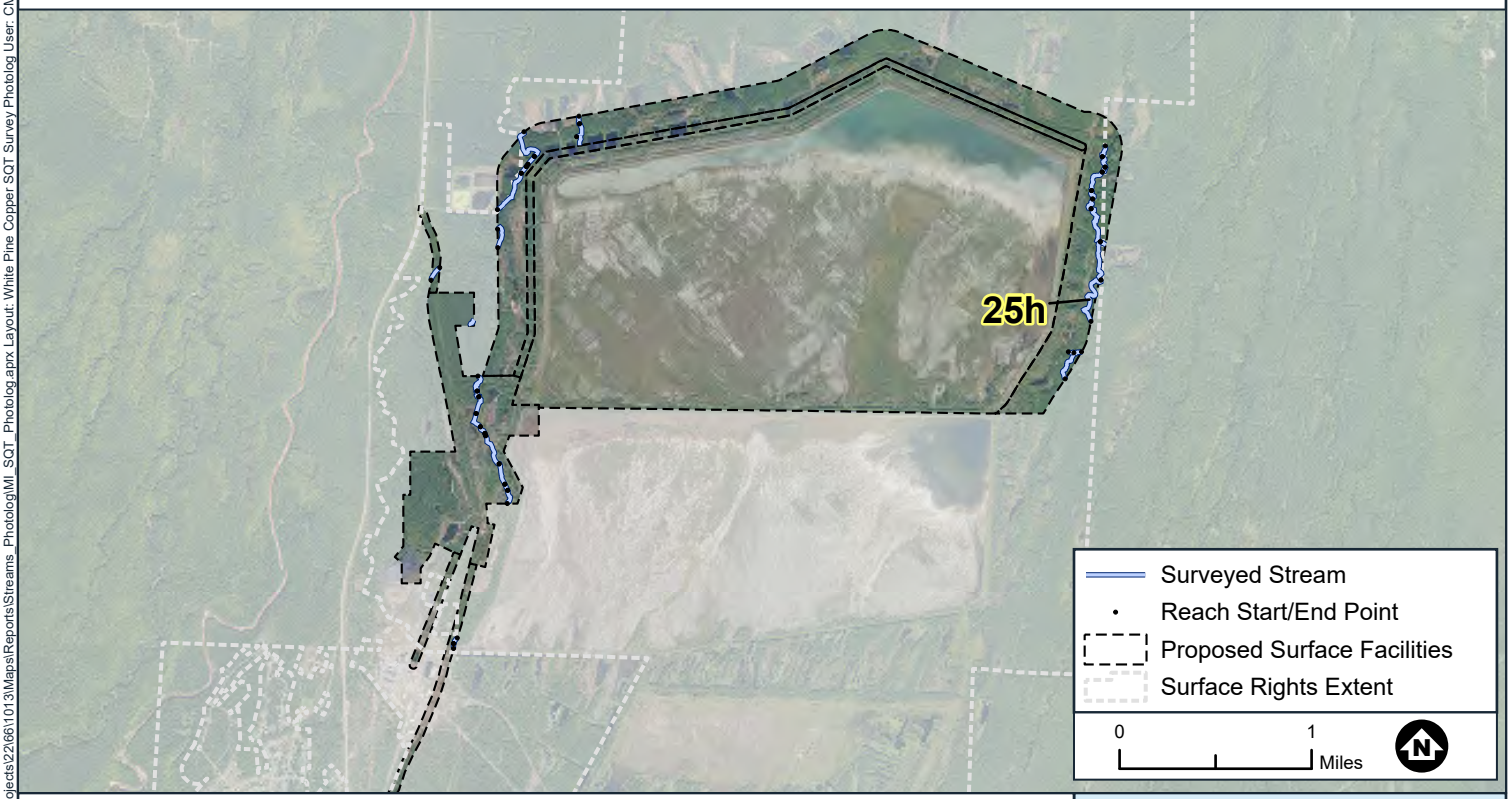
Photo caption: Representative Riffle Cross Section

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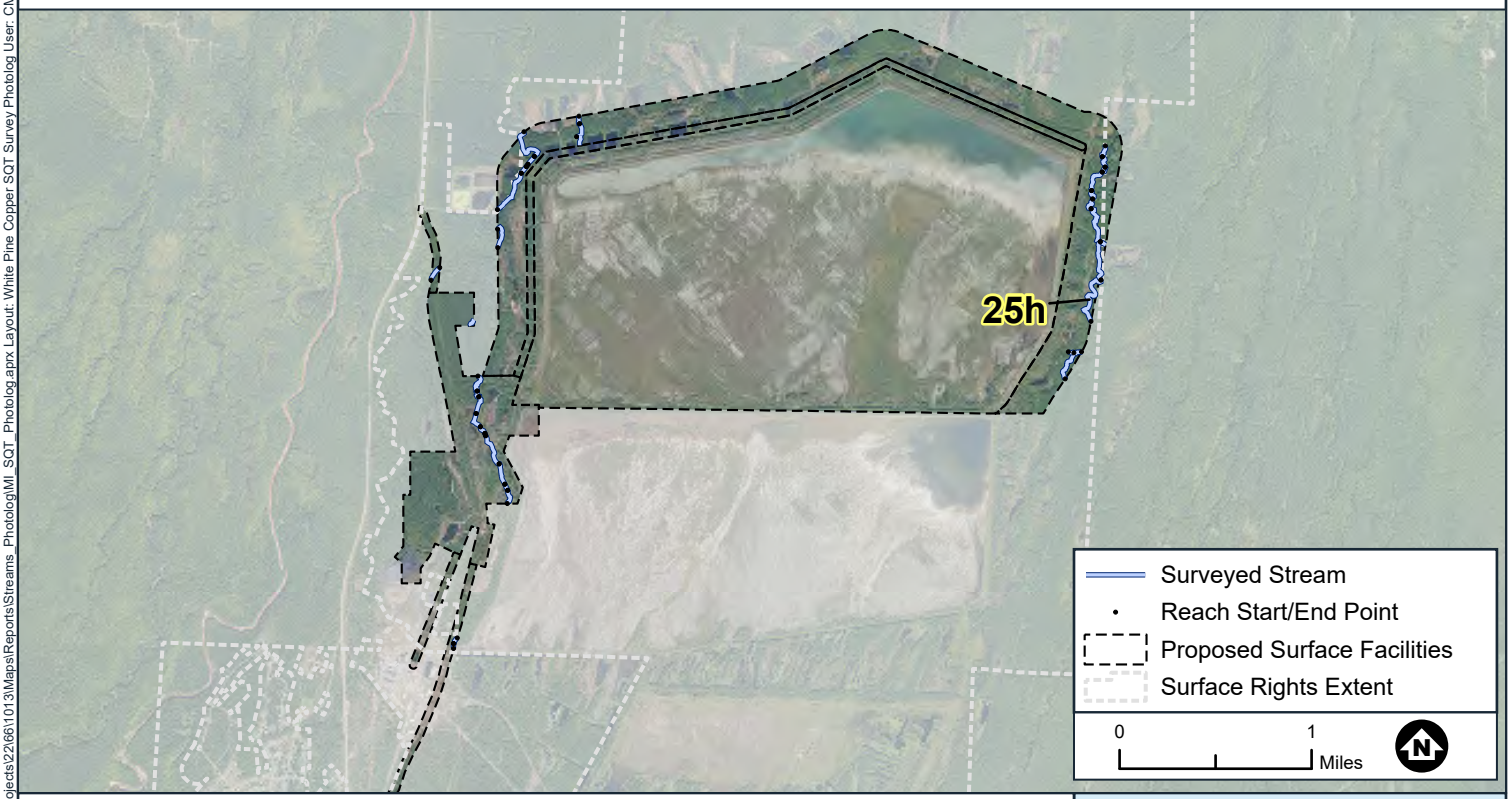
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White Pine North
White Pine Copper, LLC
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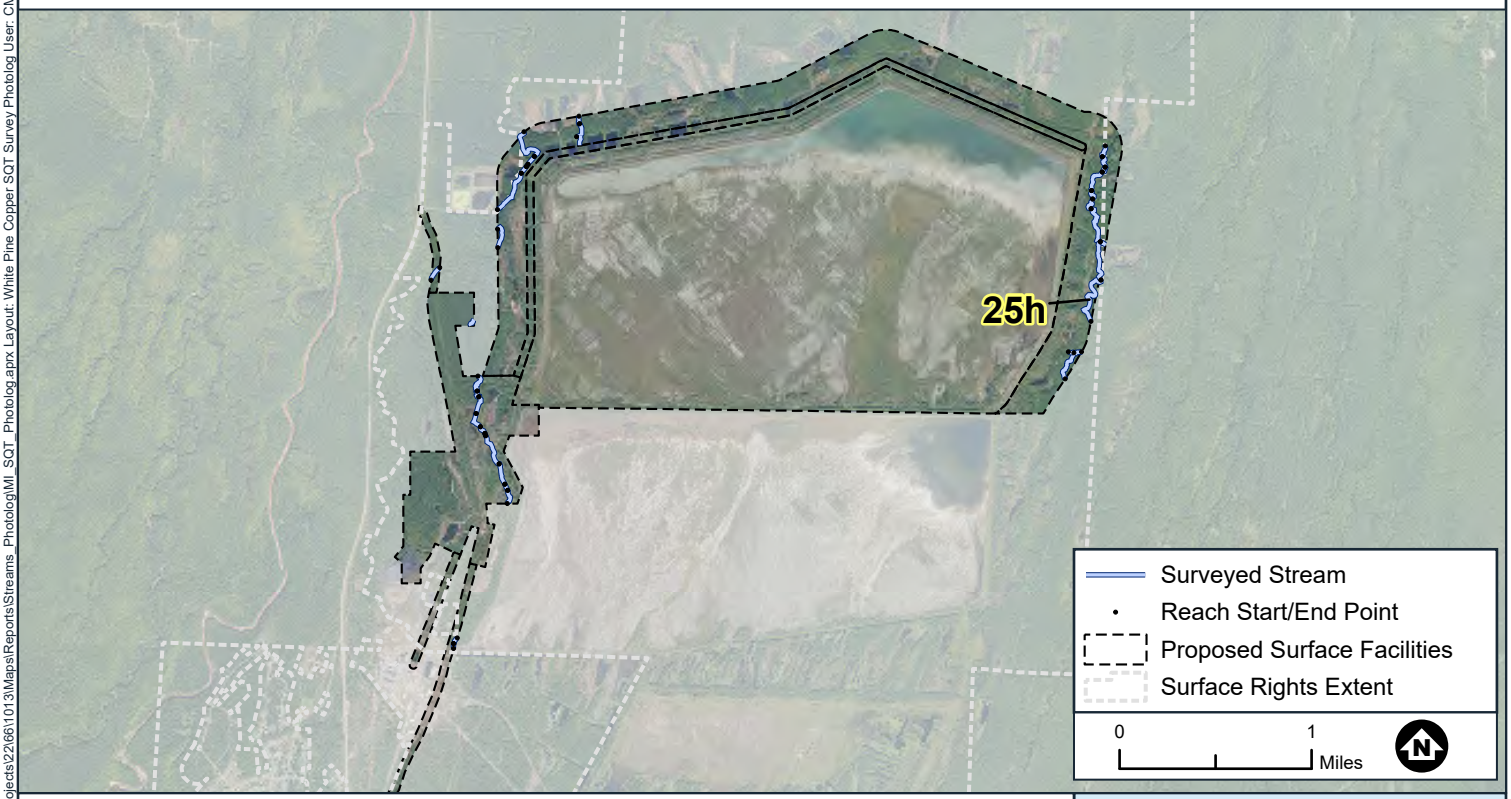
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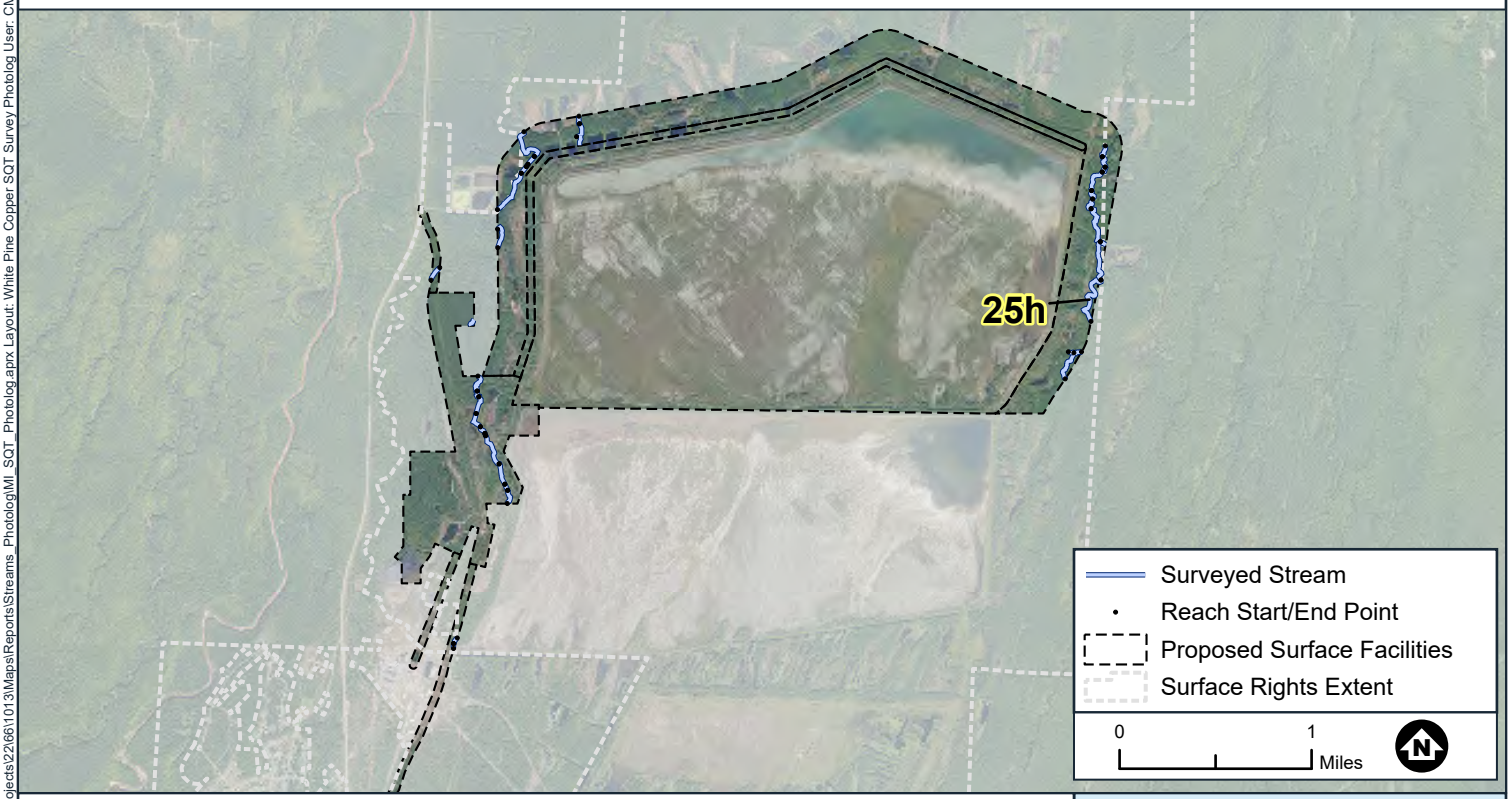
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Stream SQT Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

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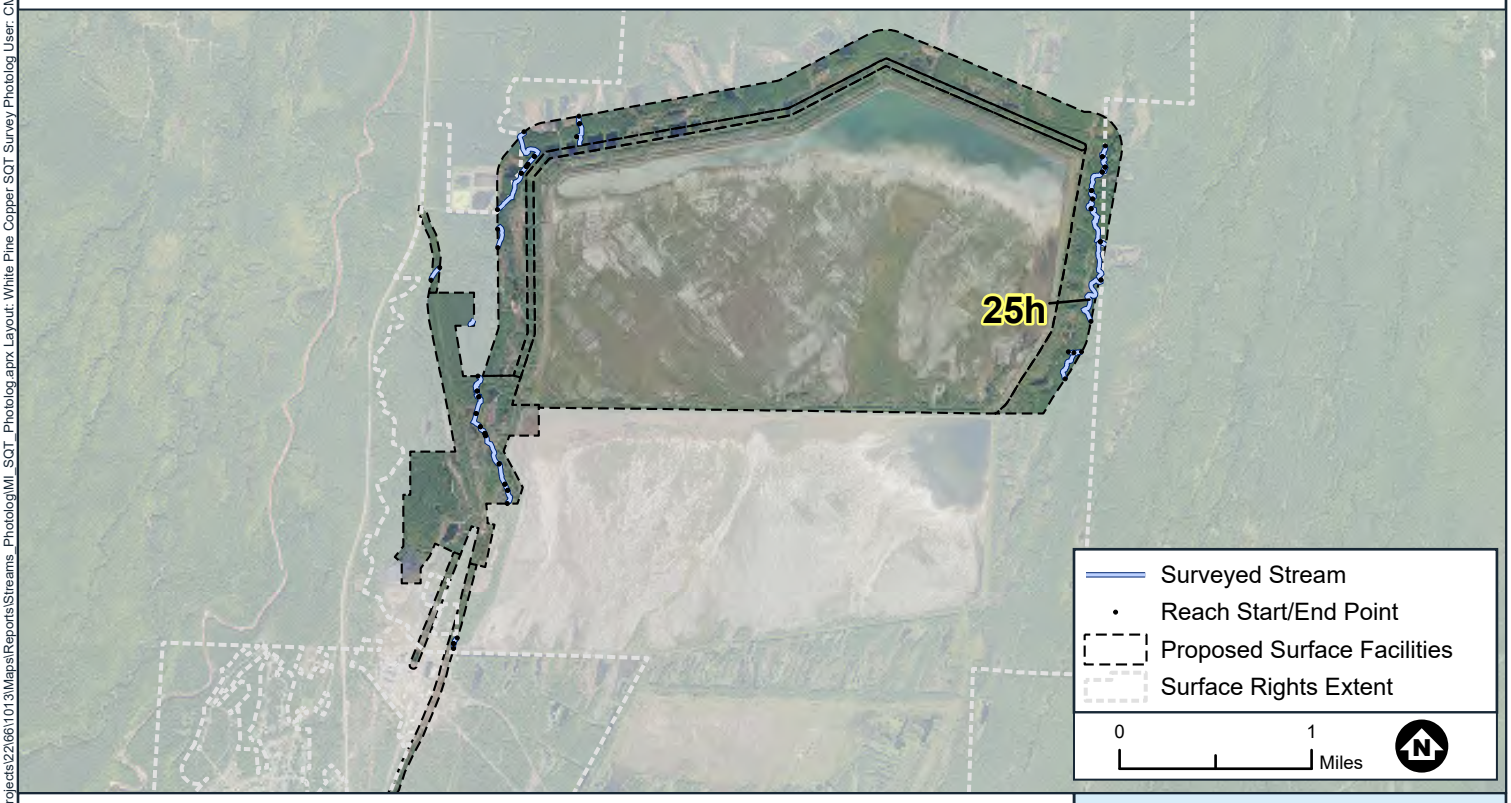
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Stream SQT Survey
Photo Log
White Pine North
White Pine Copper, LLC
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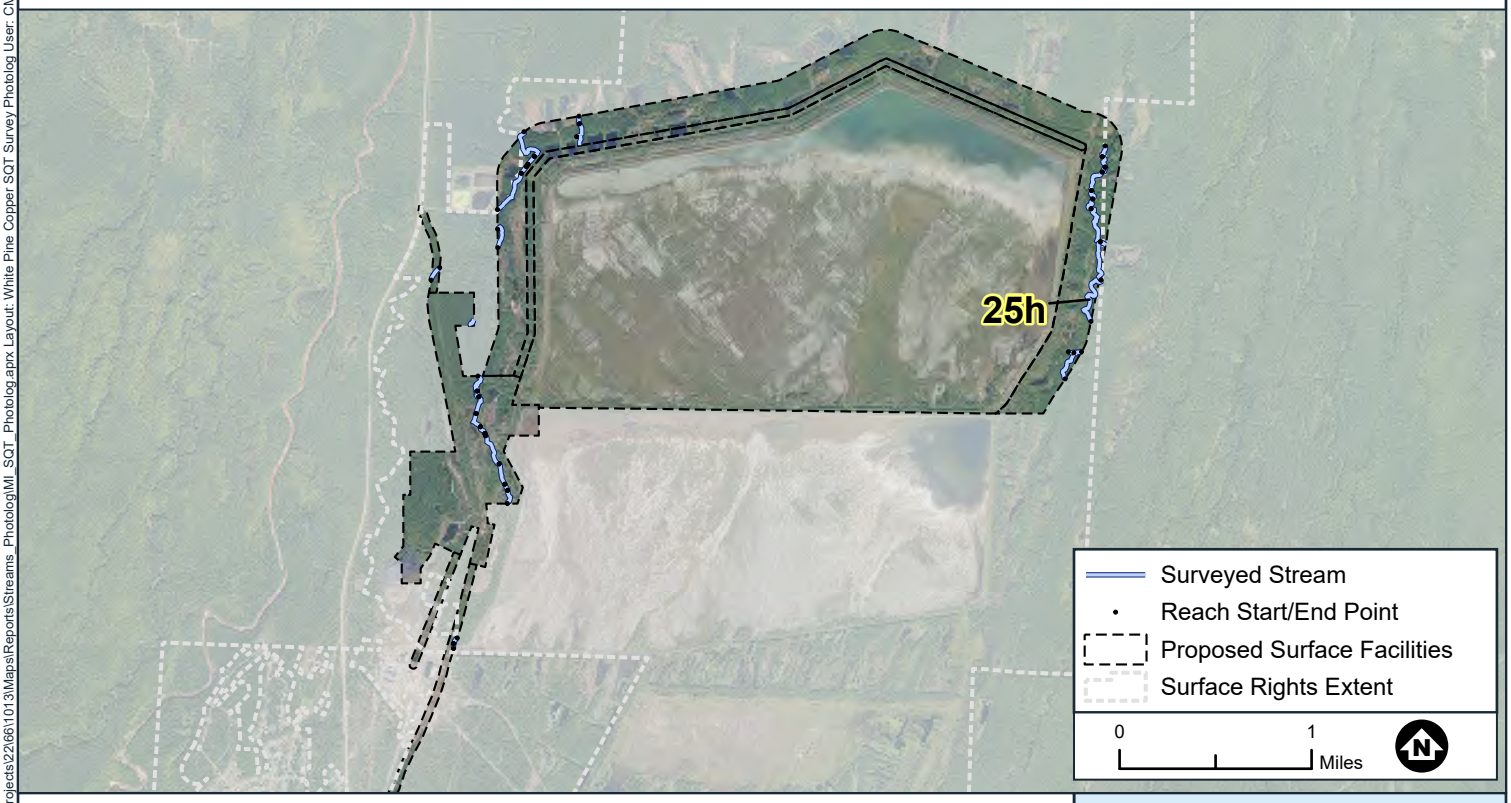
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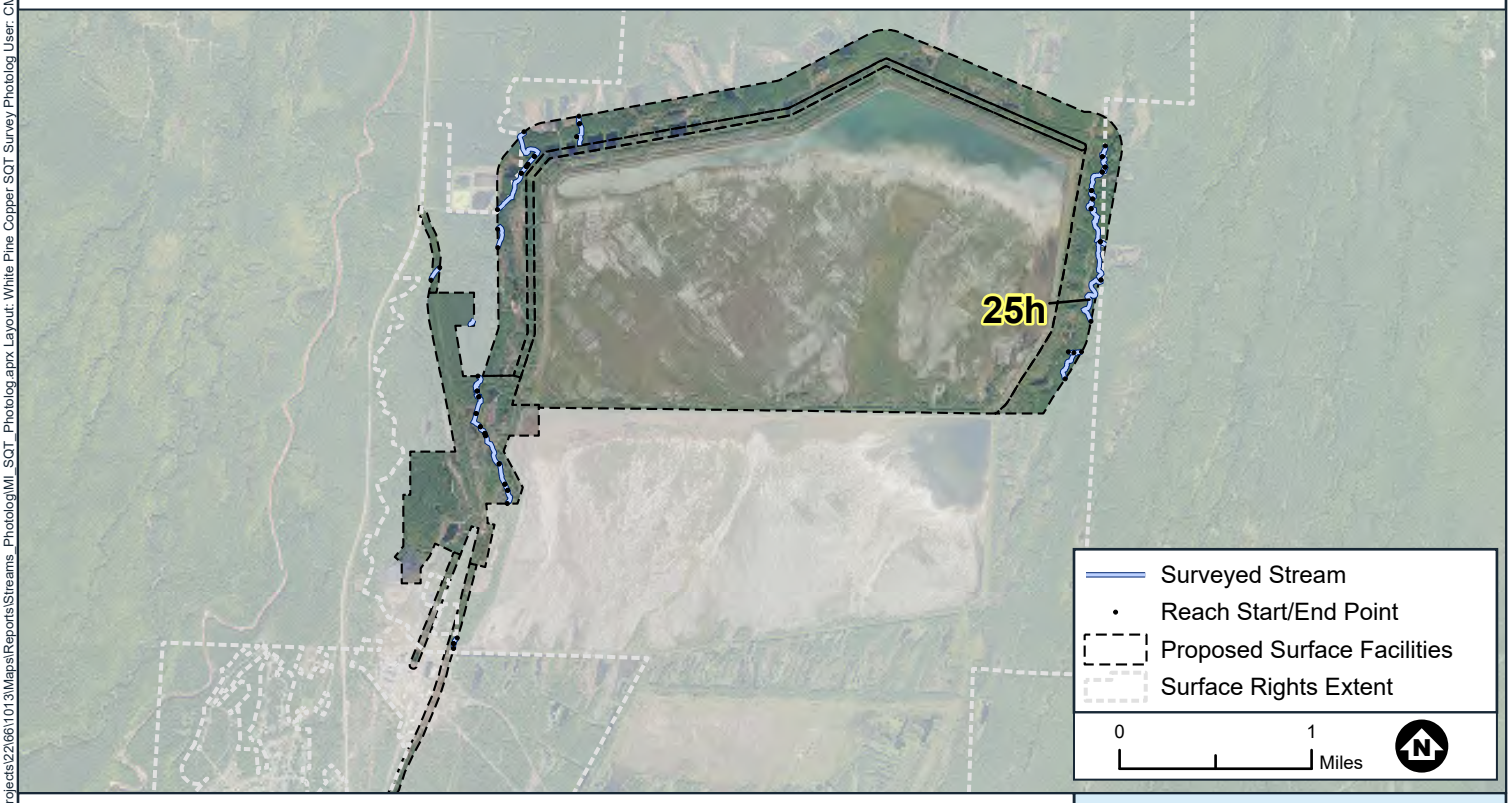
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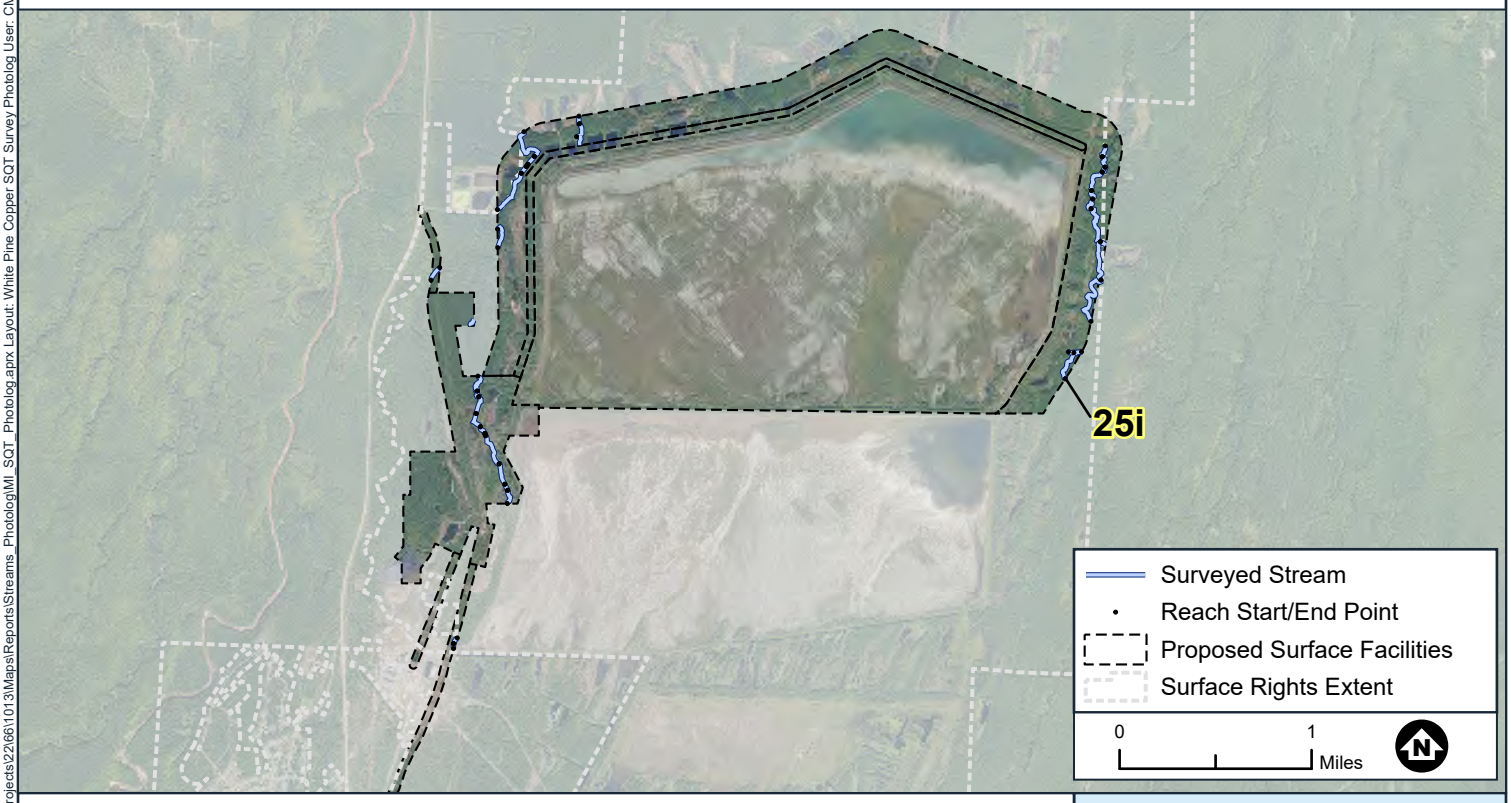
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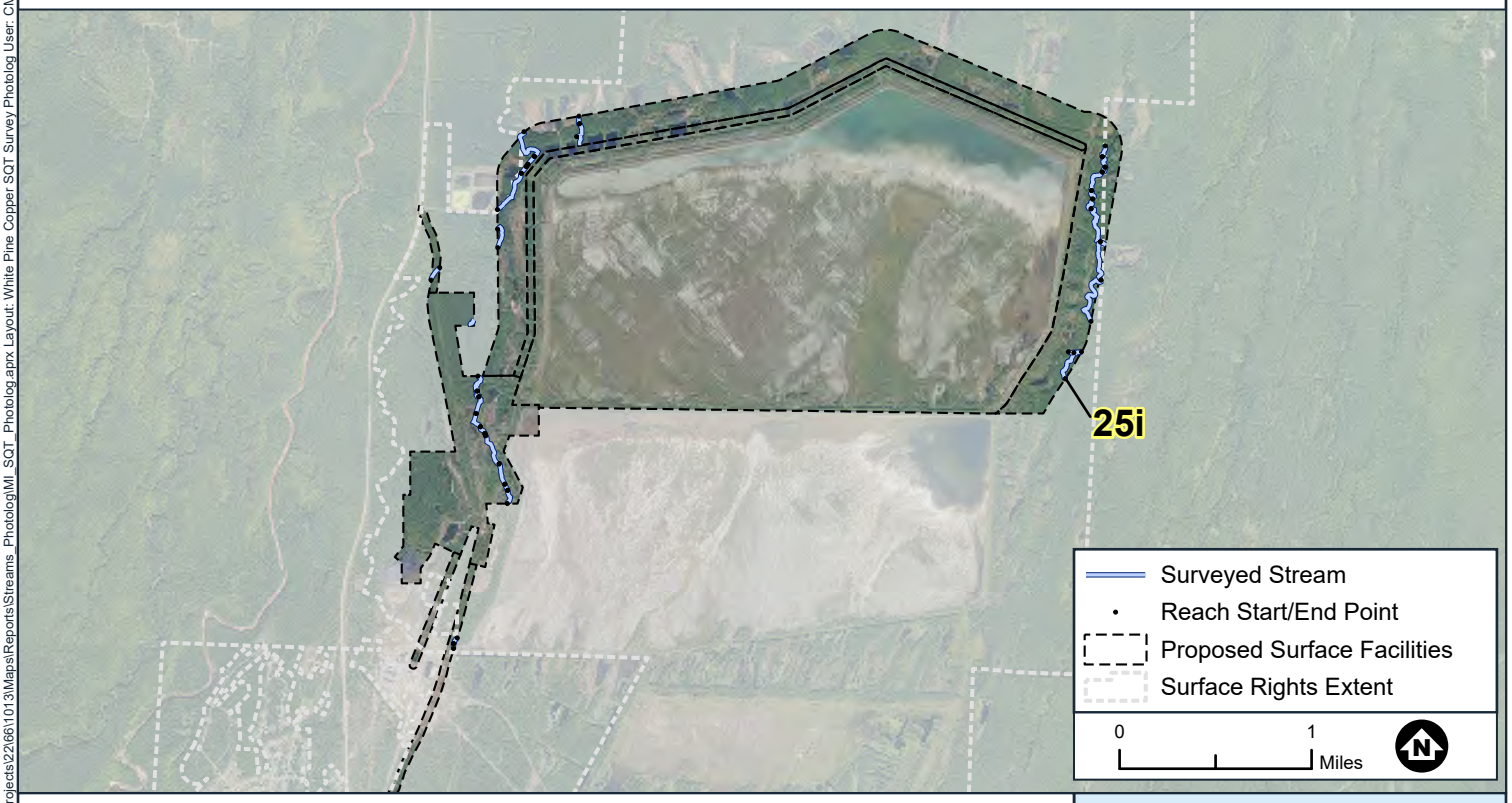
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Stream SQT Survey
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White Pine North
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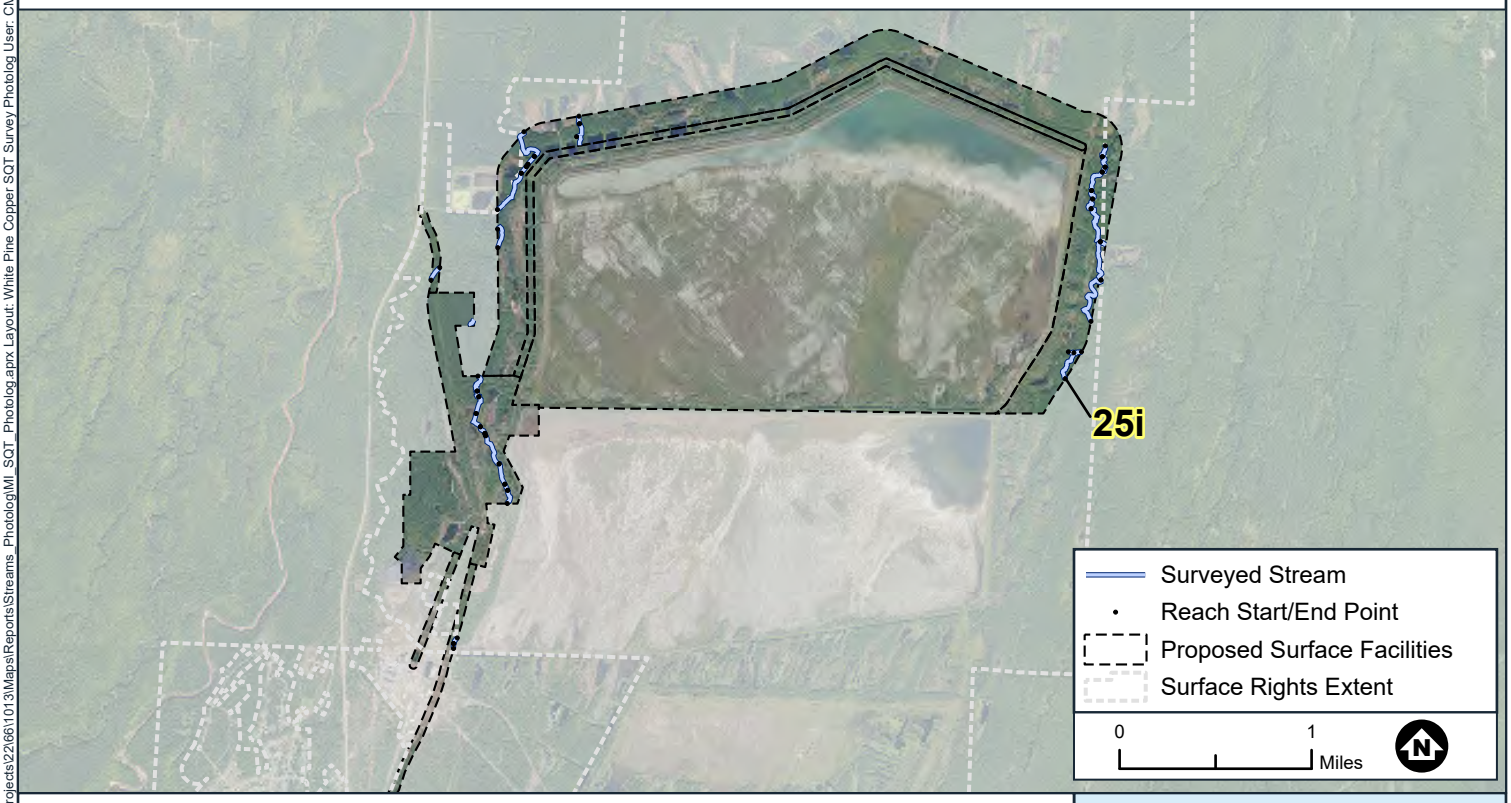
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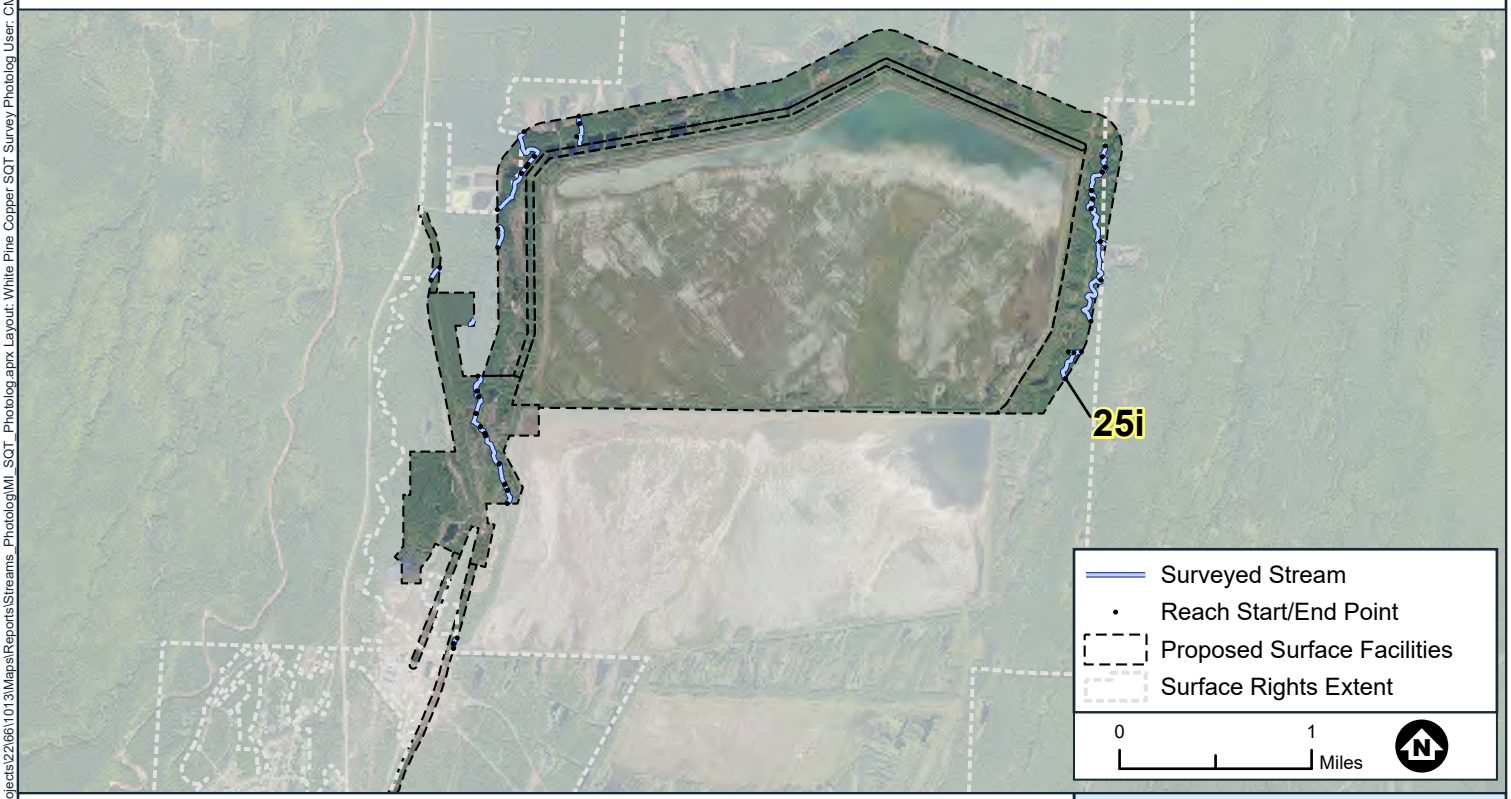
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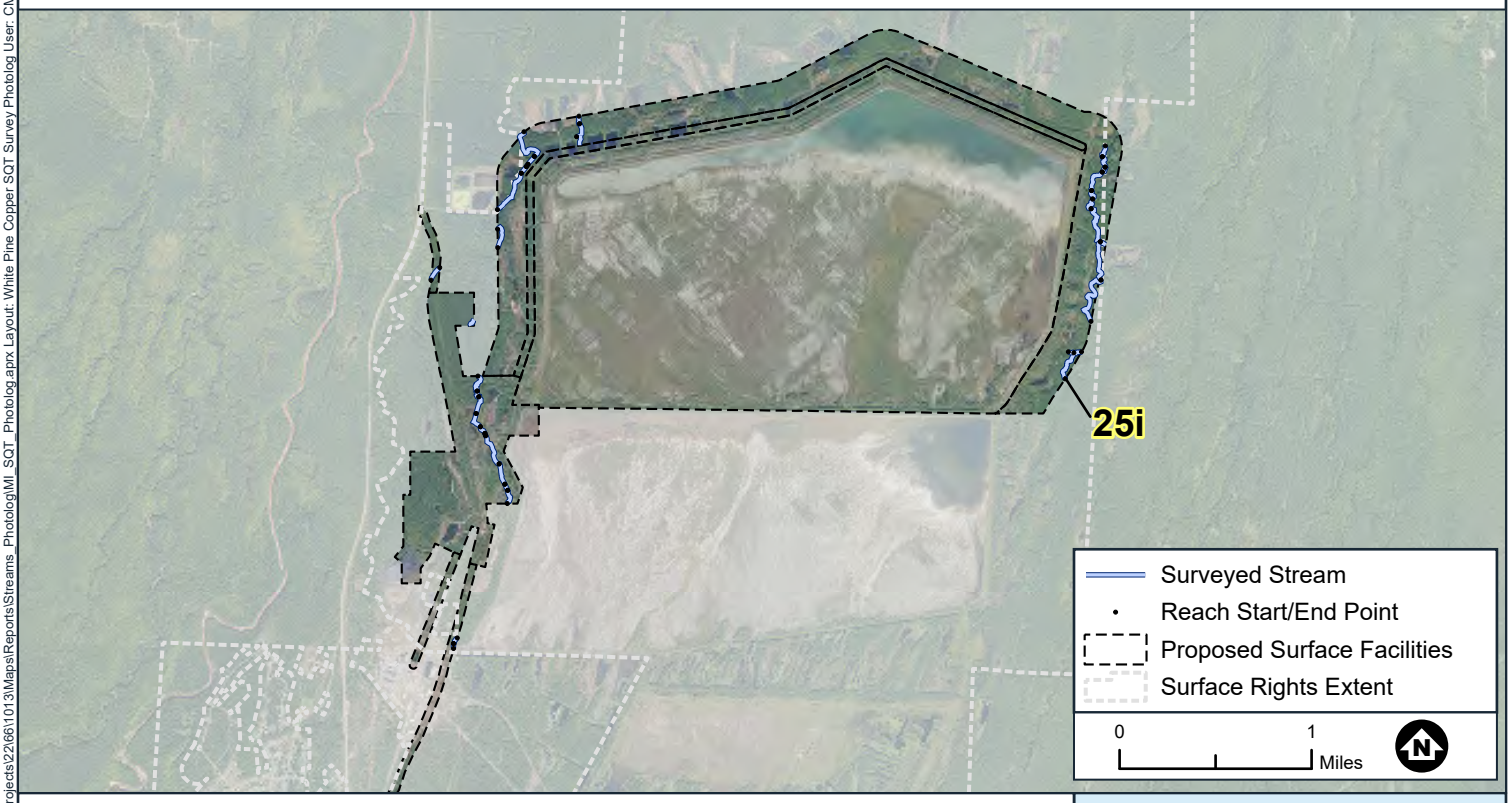
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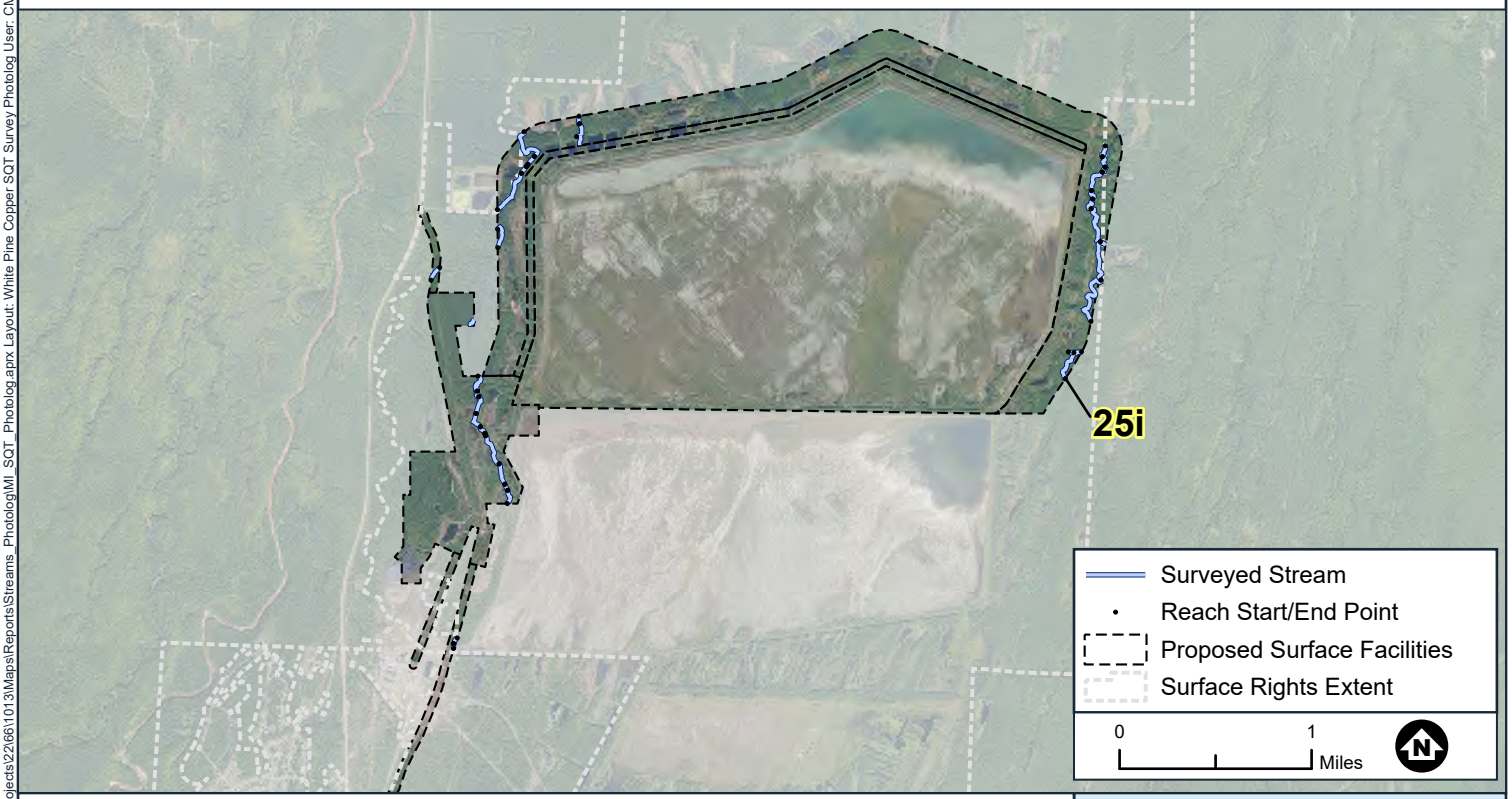
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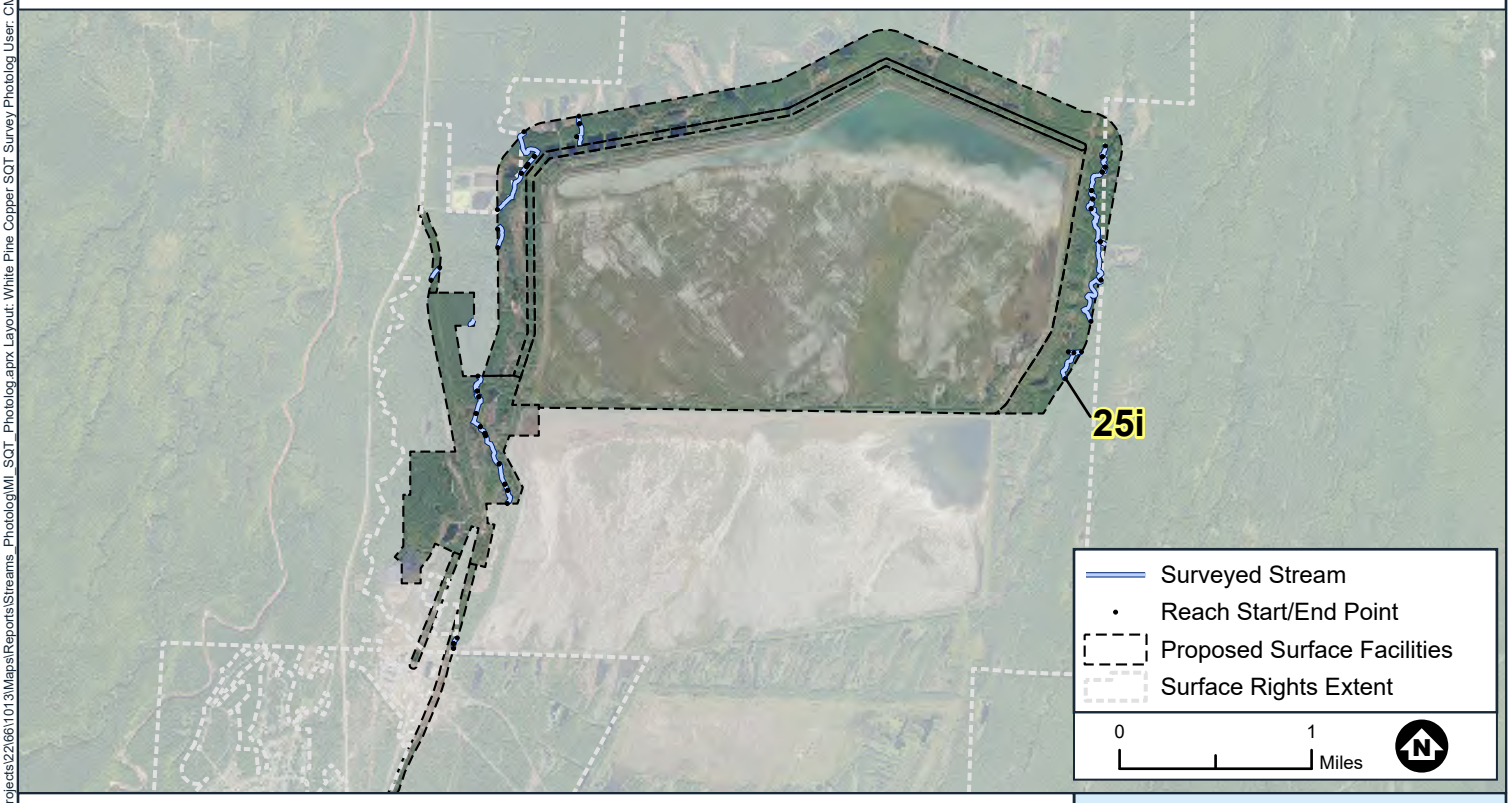
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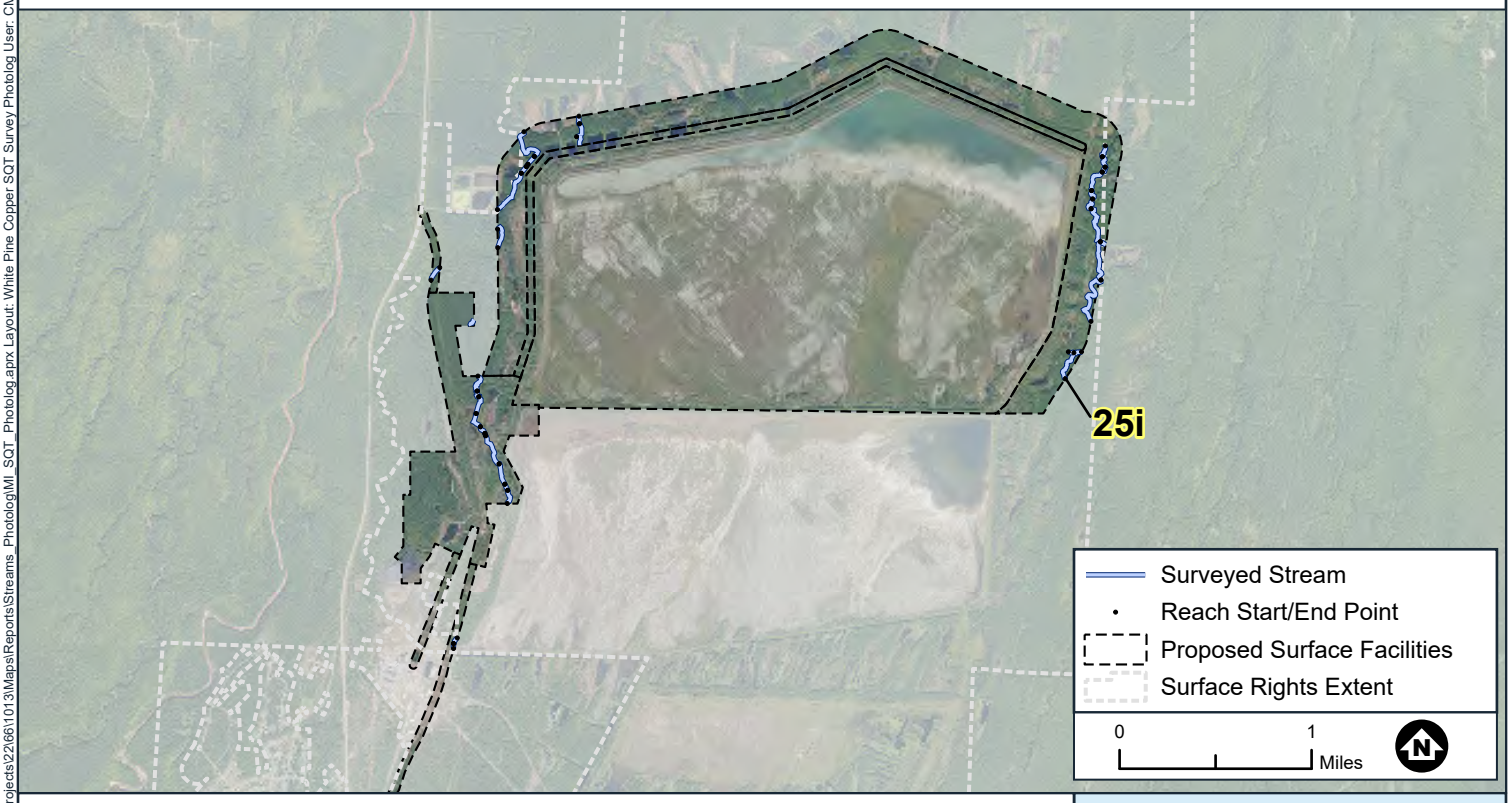
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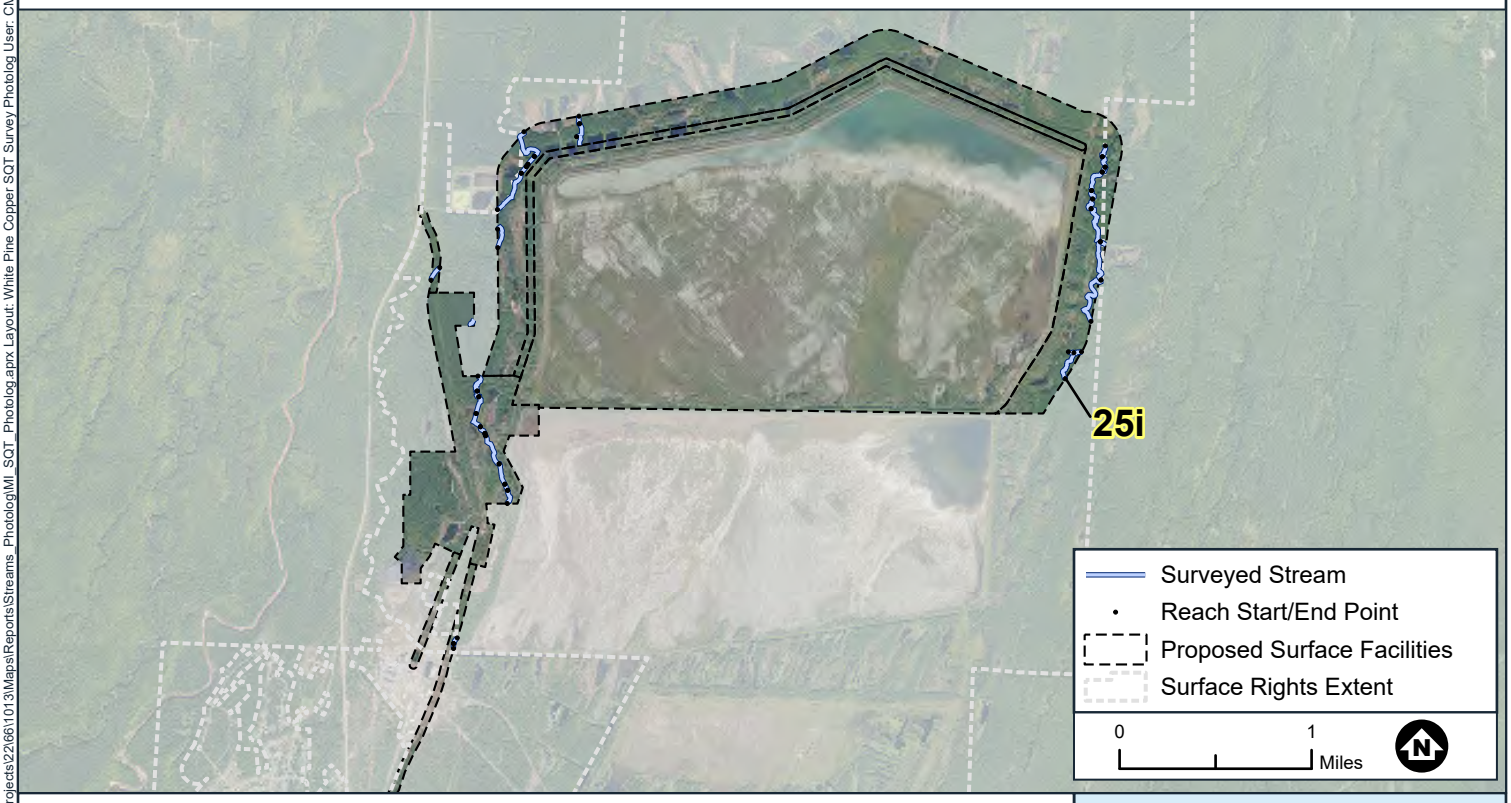
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Ontonagon County, Michigan

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Reach: 25i

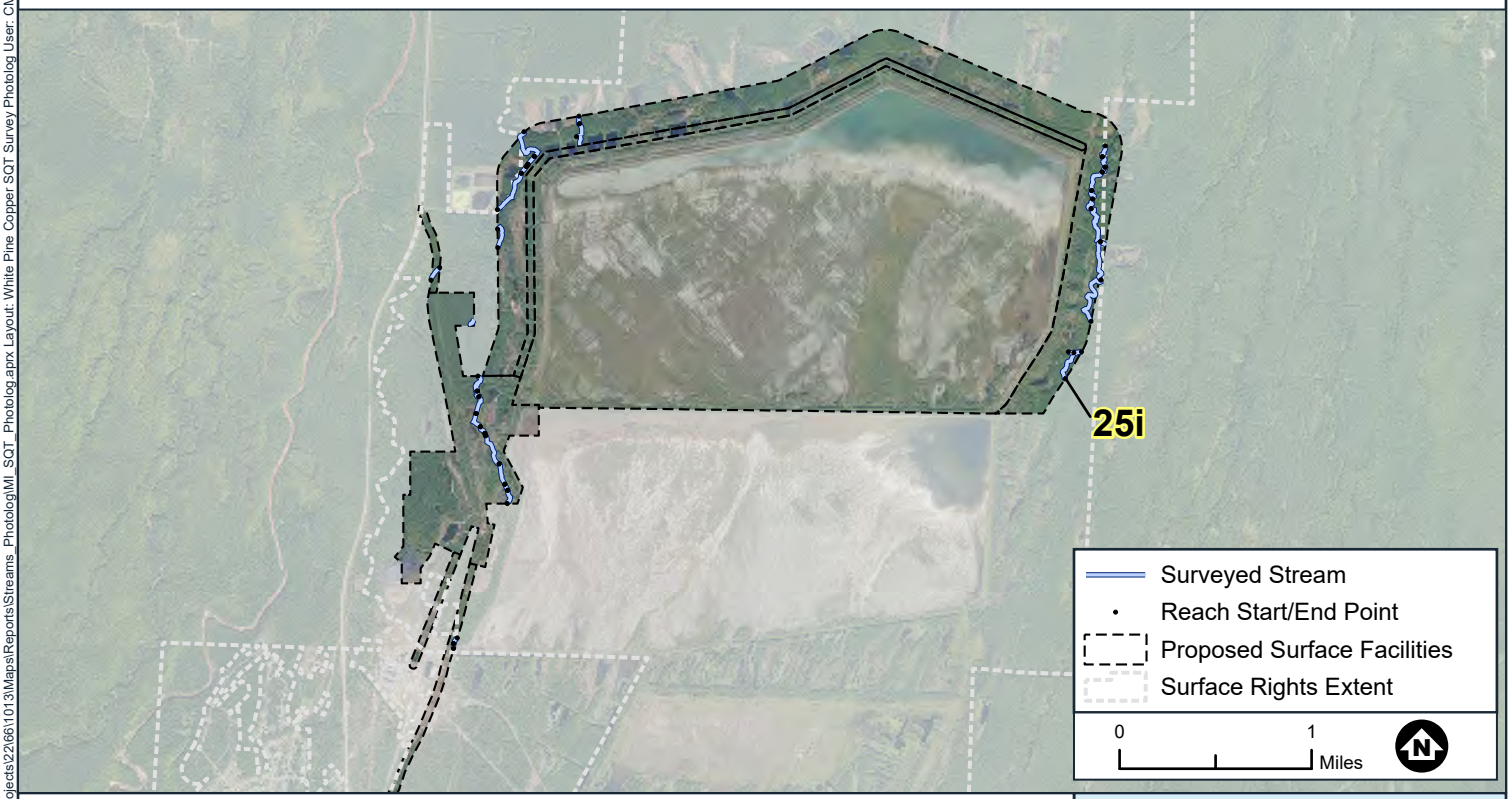
Photo caption: Streambank Assessed for Erosion

Stream SQT Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

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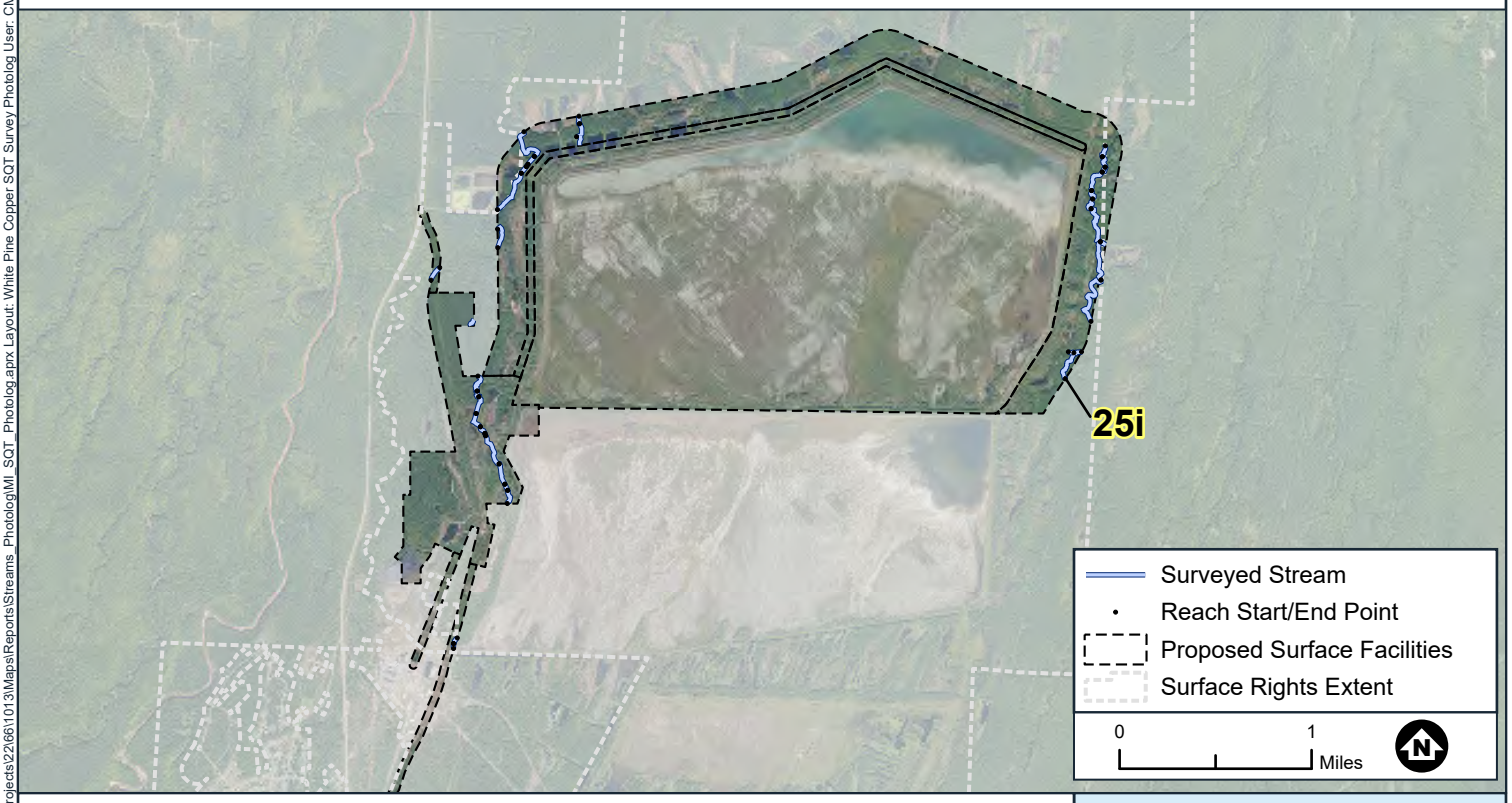
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Bar Footer: ArcGISPro 3.4, 2025-01-06 15:55 File: I:\Projects\22166\1013\Maps\Reports\Streams_Photolog\MI_SQT_Photolog.aprx Layout: White Pine Copper SQT Survey Photolog User: CML3





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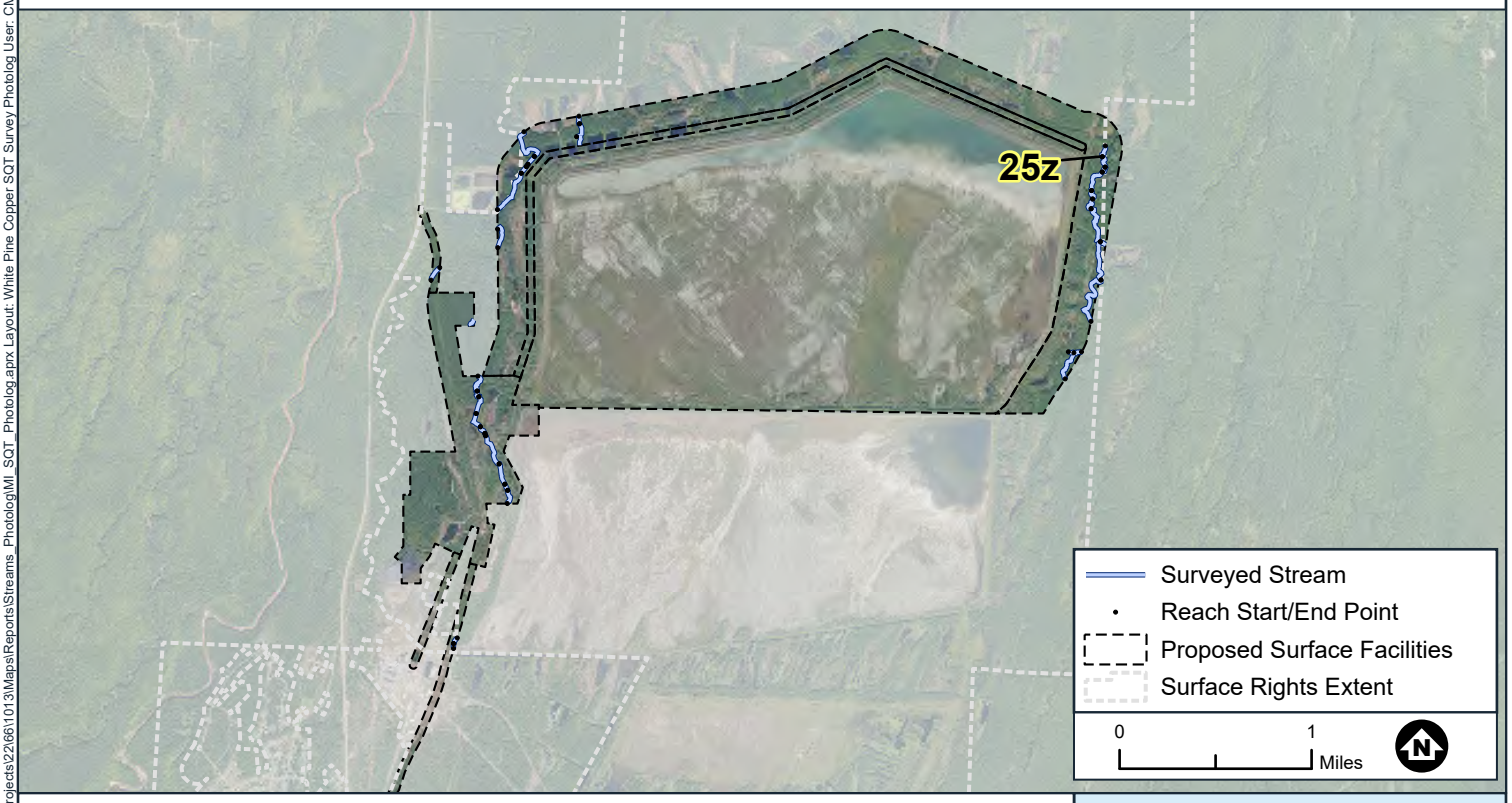
Photo caption: Streambank Assessed for Erosion

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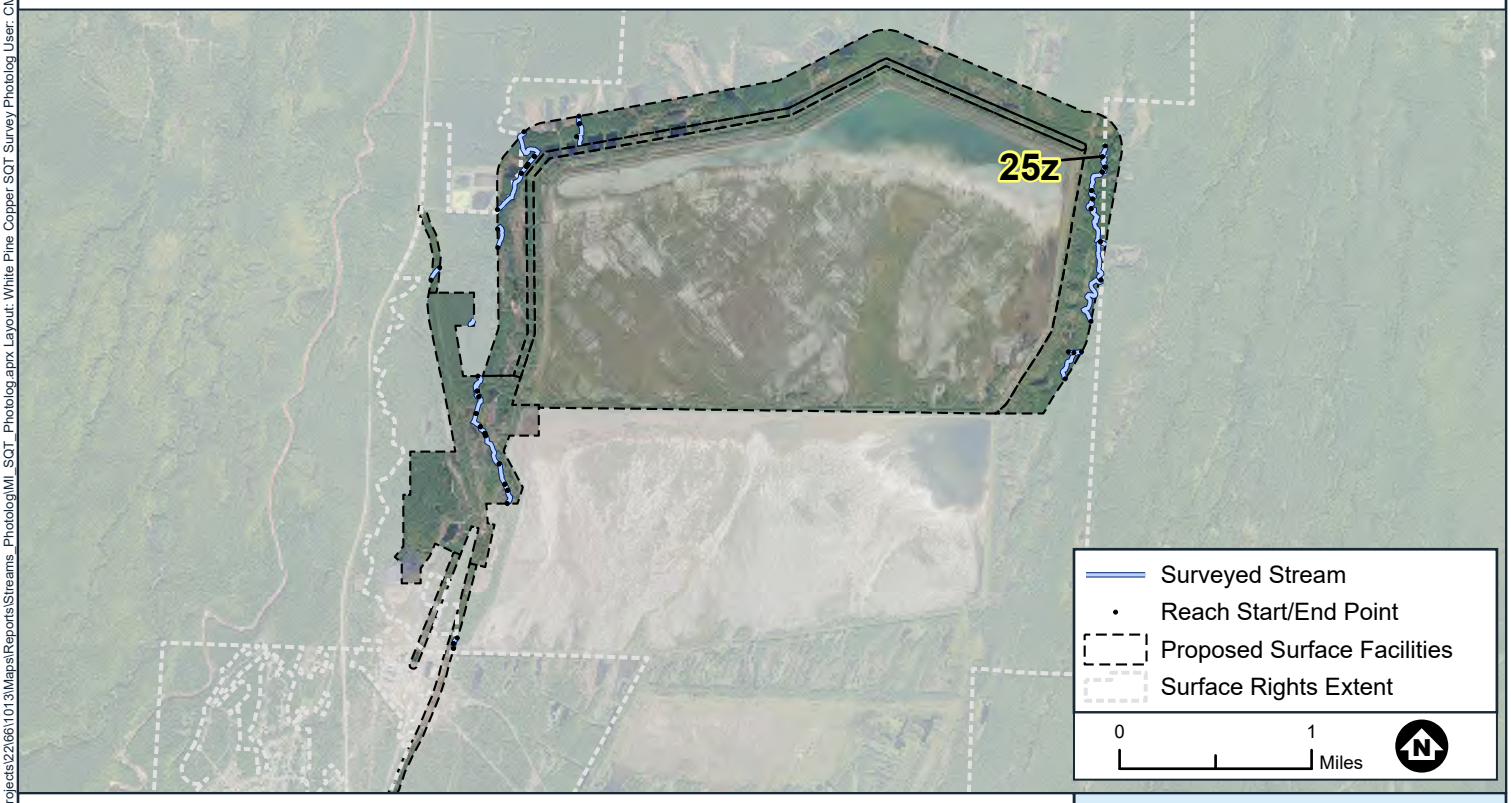
Photo caption: Start of Reach, Looking Downstream

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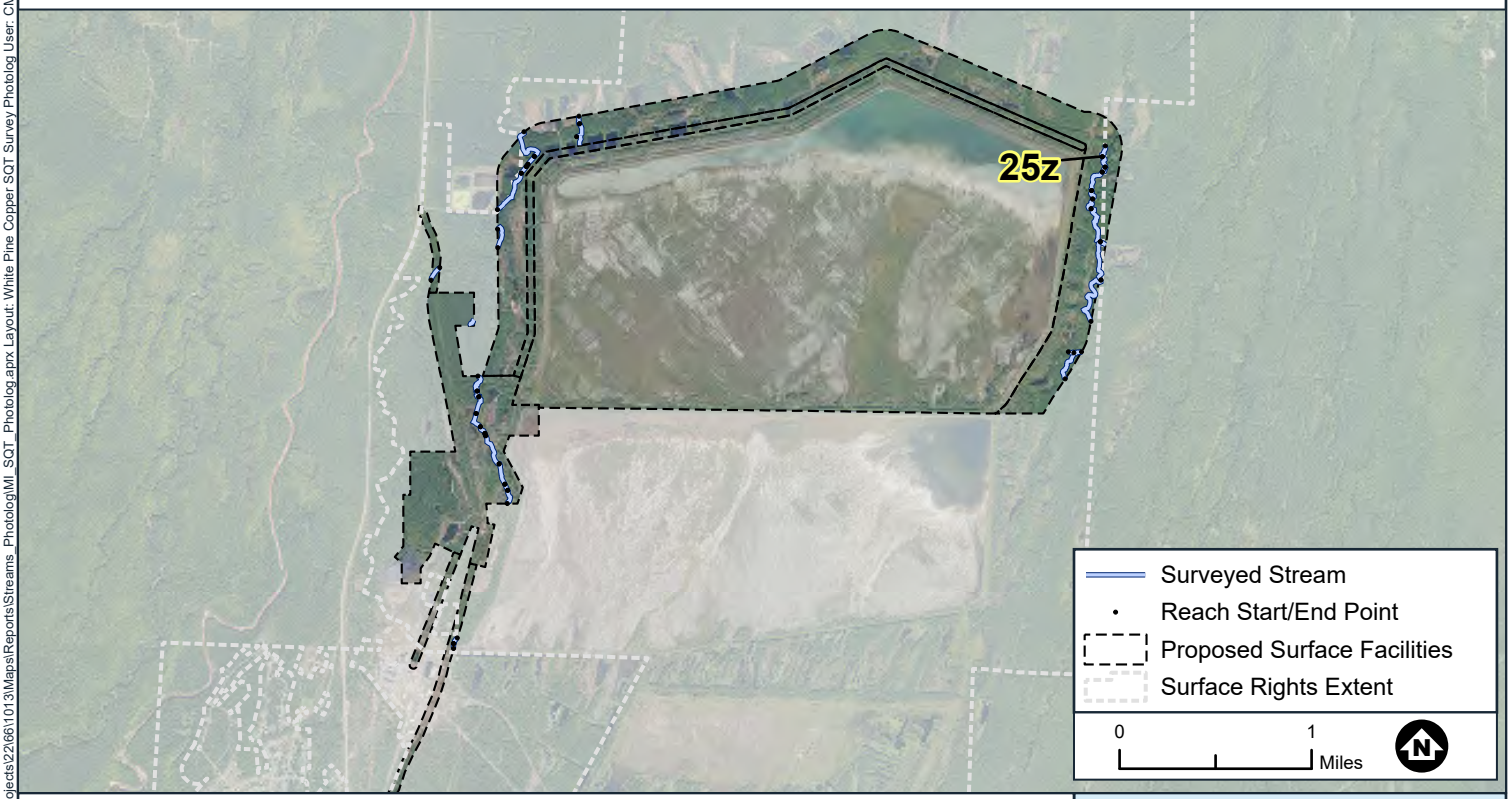
Photo caption: End of Reach, Looking Upstream

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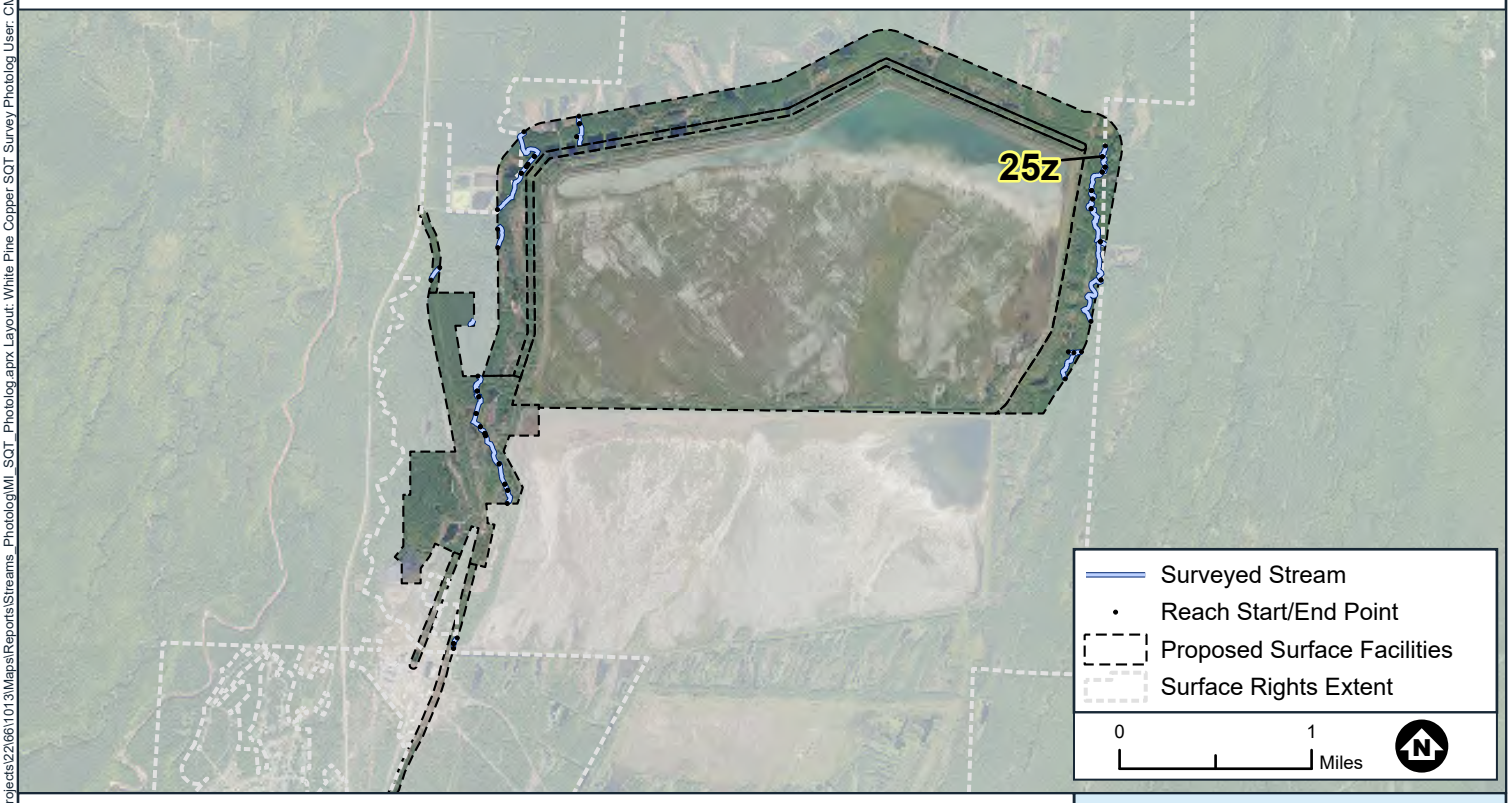
Photo caption: Representative Riffle Cross Section

Stream SQT Survey
Photo Log
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Reach: 25z

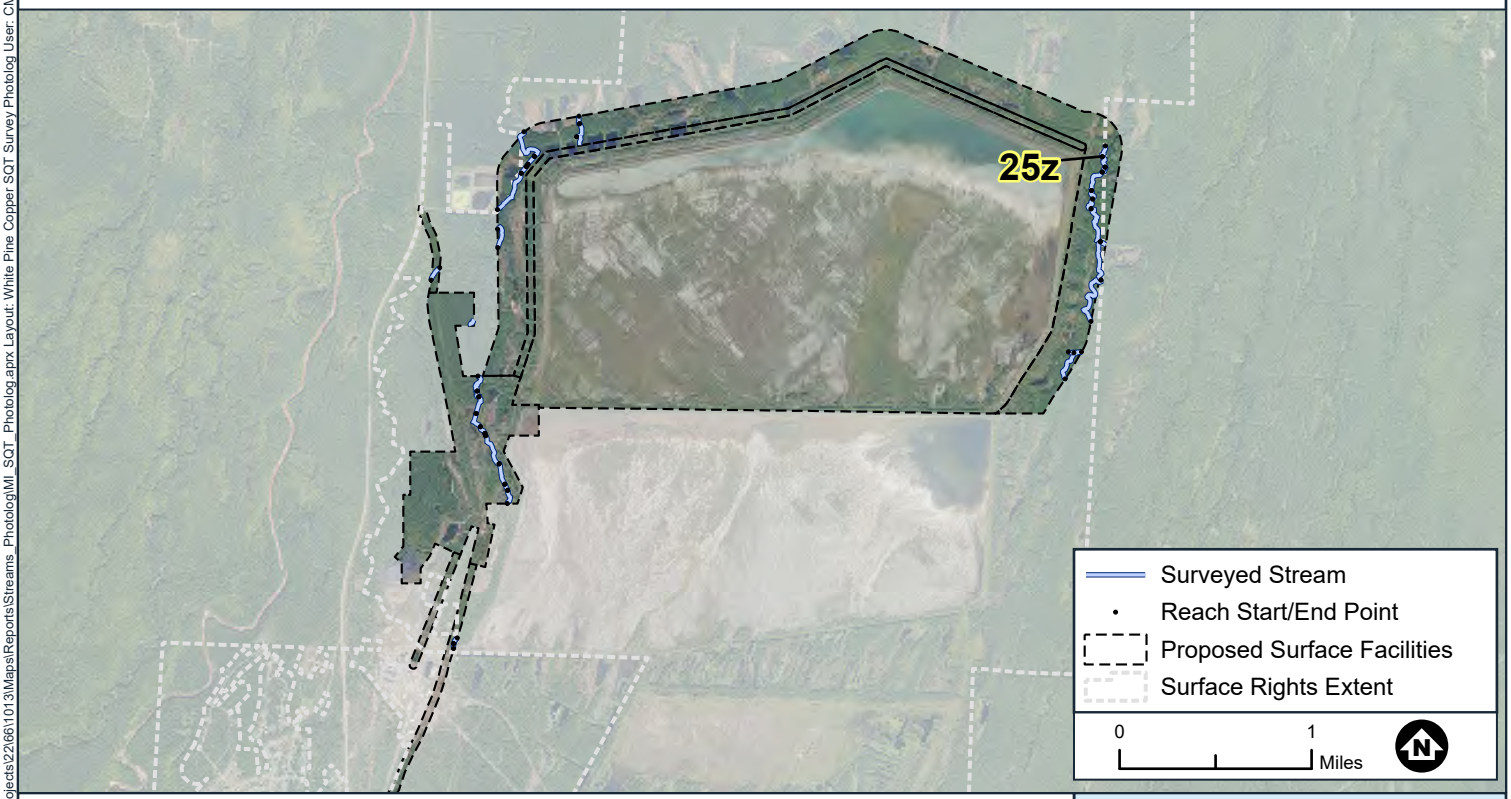
Photo caption: Streambank Assessed for Erosion

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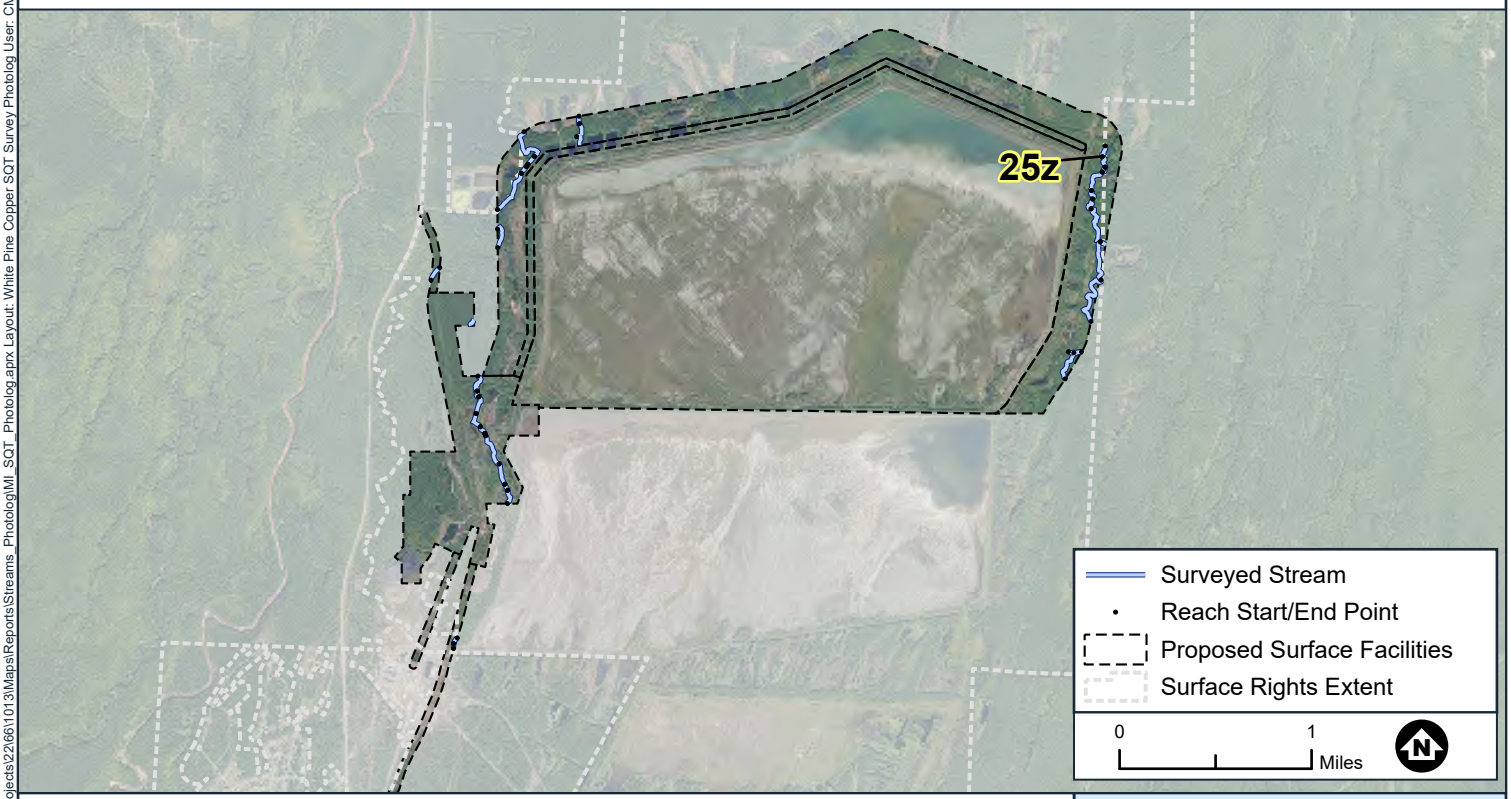
Photo caption: Streambank Assessed for Erosion

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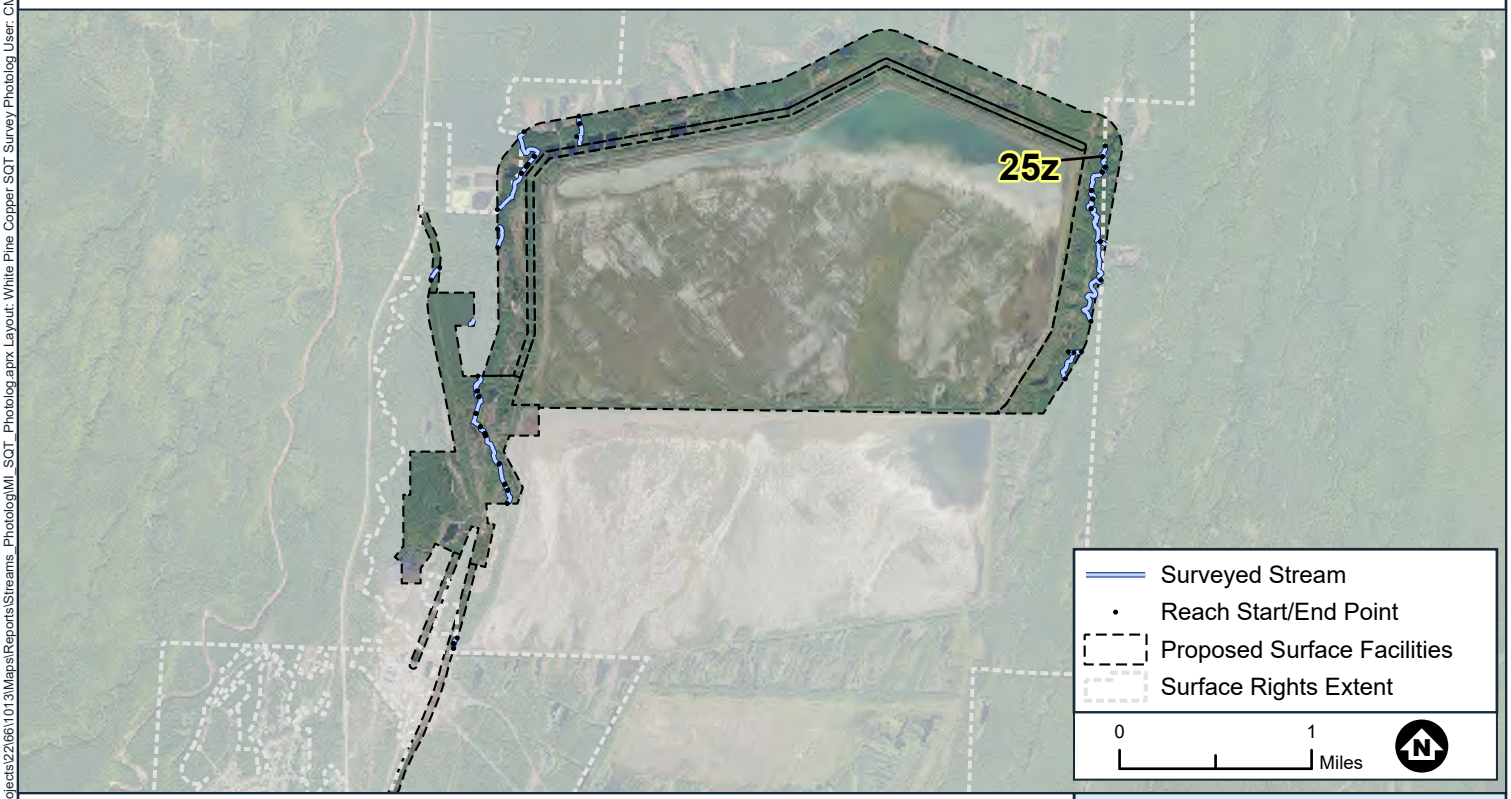
Photo caption: Streambank Assessed for Erosion

Stream SQT Survey
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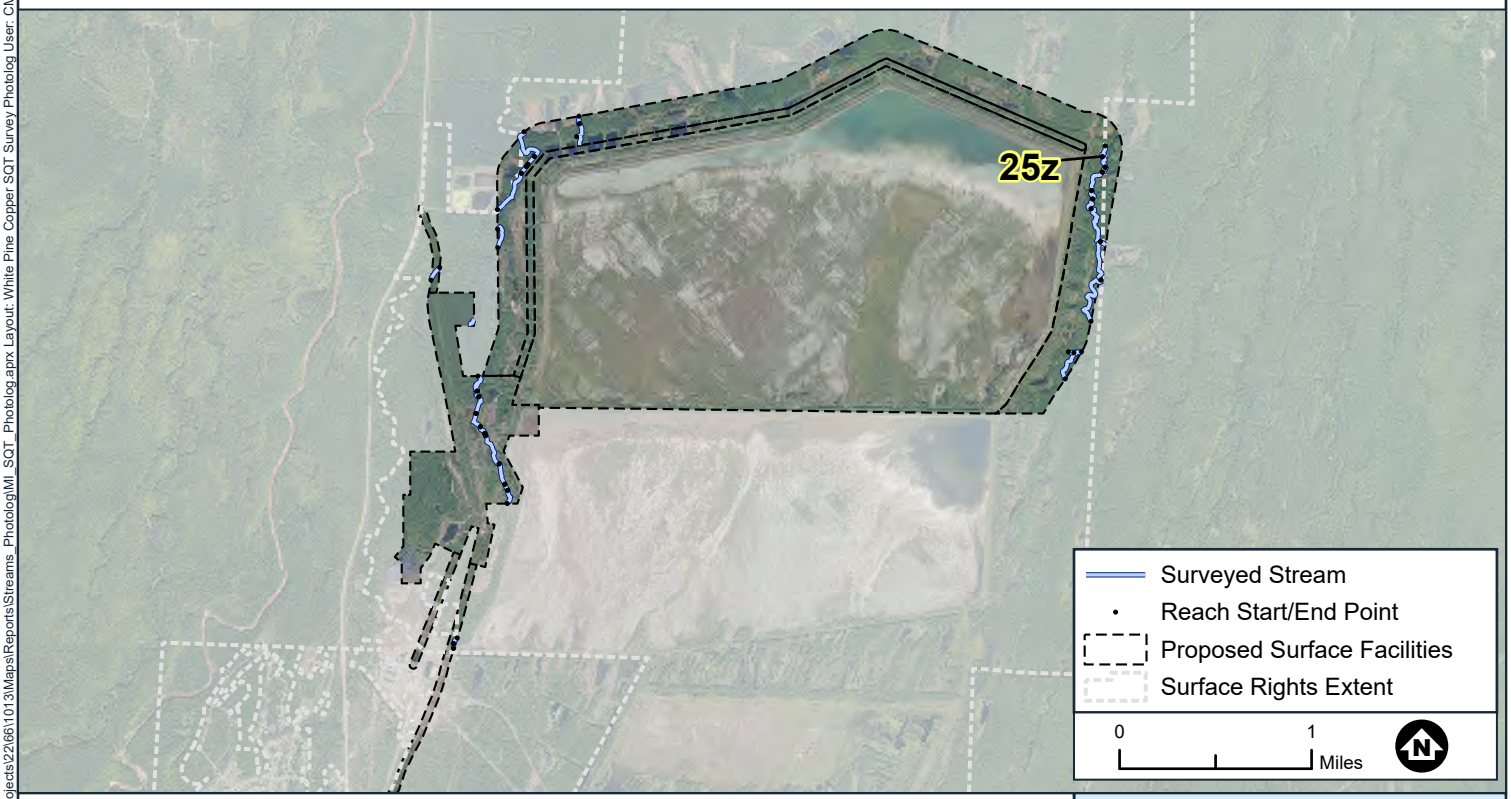
Photo caption: Streambank Assessed for Erosion

Stream SQT Survey
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Bar Footer: ArcGISPro 3.4, 2025-01-06 15:55 File: I:\Projects\22166\1013\Maps\Reports\Streams_Photolog\MI_SQT_Photolog.aprx Layout: White Pine Copper SQT Survey Photolog User: CML3





Reach: 25z

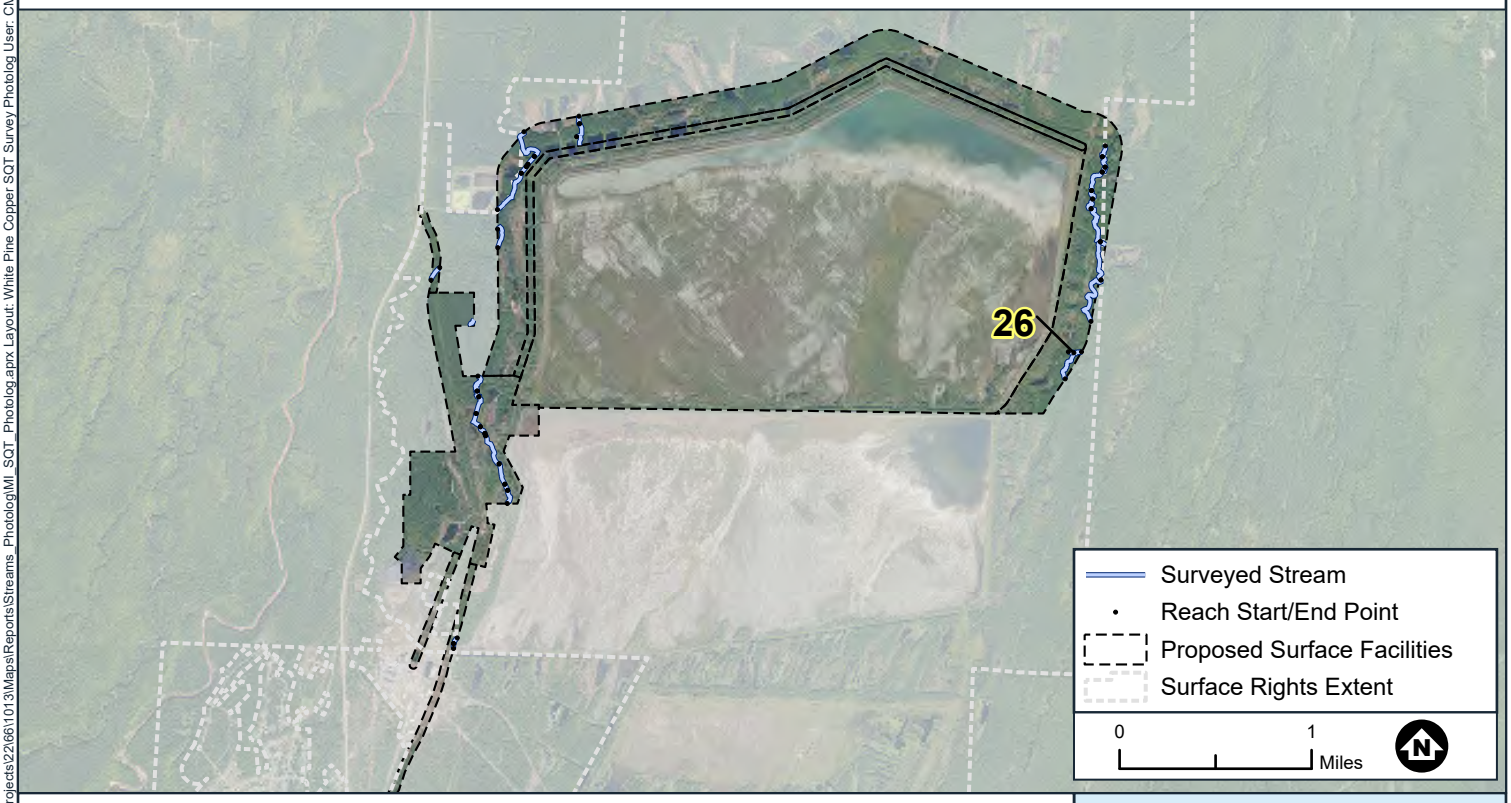
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Stream SQT Survey
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Bar Footer: ArcGISPro 3.4, 2025-01-06 15:55 File: I:\Projects\23166\1013\Maps\Reports\Streams_Photolog\MI_SQT_Photolog.aprx Layout: White Pine Copper SQT Survey Photolog User: CML3





Reach: 26

Photo caption: Representative Riffle Cross Section

Stream SQT Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

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Barr Footer: ArcGISPro 3.4, 2025-01-06 15:55 File: I:\Projects\23166\1013\Maps\Reports\Streams_Photolog\MI_SQT_Photolog.aprx Layout: White Pine Copper SQT Survey Photolog User: CML3

Appendix C

Supplementary Stream Assessment Data

Vegetation Data from Stantec

Stantec Consulting Services Inc.
2080 Wooddale Drive, Suite 100
Woodbury MN 55125-2920

September 10, 2024

Project/File: 193710518

Amanda Zeidler
White Pine Copper, LLC
Senior Director, Environment

Greetings Amanda,

Reference: White Pine Copper SQT Riparian Plot Survey Data Collection

In support of the White Pine Copper, LLC, White Pine Mine Project Stantec has completed riparian vegetation surveys to assist Barr Engineering with their Michigan Stream Quantification Tool (SQT) data collection effort. The following memo and attachments detail the data collection methods and results of the riparian vegetation survey.

Methods

Field survey methods, outlined in the Michigan Stream Quantification Tool Data Collection and Analysis Manual MiSQT v1.0 (2020) were implemented to complete the riparian vegetation plot surveys along SQT Representative Sub-Reaches identified by Barr Engineering. Several of the reaches were short (<250 LF) and most of the reaches were uniform in vegetation composition. Due to these factors, one riparian plot survey was conducted for most reaches. Where riparian vegetation was variable either throughout the reach or across the banks multiple riparian plots were surveyed to capture the variability observed. All plots were circular with 30-foot radii and the herbaceous strata plot in the center. All plots, except two, were centered 30 feet from bankfull. Along sub-reaches 25Z and 9 a second plot (25Z-RB and 9-LB) was surveyed a random distance from the stream bank to capture vegetation variability due to topographic changes that would not have been captured in a near bank plot.

Each sub-reach was walked and riparian plots were randomly located along the sub-reach. For all plots, a tape measure was stretched from bankfull, or a random location from the bank for plots 25Z-RB and 9-LB, to 30 feet where a flag was placed to denote the center of the plot and location of the herbaceous layer plot. The tape measure was then stretched an additional 30 feet in multiple directions to denote the bounds of the riparian plot. All species within the herbaceous layer were identified and percent cover for each species was estimated within a one square meter sample plot near the center of each riparian plot. Within the riparian plot all trees with at least a 3-inch diameter at breast height (DBH) were identified and DBH was measured to the nearest tenth of an inch. Trees with multiple stems were noted and DBH of each stem was measured at 4.5 feet above the ground. All shrubs and saplings greater than 3.28 feet in height and less than 3-inches DBH were identified, and each stem was counted. The location of the center of each riparian plot was collected with a global positioning system (Attachment B) and a representative photo of each plot was taken and organized in a photolog (Attachment C).

Results

On August 5th and 6th 2024, Stantec conducted SQT riparian vegetation plot surveys along SQT Representative Sub-Reaches identified by Barr Engineering. SQT metrics were calculated and summarized in Table 1 below. Common names, scientific names, wetland indicator status, physiognomic classification and native/non-native status were determined from the University of Michigan's Michiganflora.net database. Average DBH was calculated across all plots for each sub-reach, average tree density was calculated as stems per acre for each sub-reach, average native shrub/sapling density for each sub-reach was calculated in stems per acre, and the average herbaceous cover was calculated by averaging the percent native cover values for all plots within a sub-reach. The full dataset is attached in Table 2, Attachment A.

Table 1. Stream Quantification Tool Riparian Vegetation Metric Values.

Sub-Reach ID	Average DBH (inches)	Tree Density (stems per acre)	Shrub/sapling density (native) (stems per acre)	Native Herbaceous Cover (%)
1A	4.1	184.9	1926.0	65
1B	7.1	323.6	708.8	35
2A	3.7	154.1	939.9	45
2B	0	0.0	1864.4	40
2C	4.4	323.6	123.3	40
2D	5.7	46.2	924.5	85
3A	4.7	61.6	1463.8	100
3B	4.8	200.3	1494.6	60
4A	5.7	138.7	1217.3	100
7	7.1	400.6	1679.5	65
9	7.9	493.1	269.6	27.5
10A	3.9	123.3	2033.9	65
10B	0	0.0	1063.2	40
10C	9	878.3	693.4	0
11A	5	477.7	385.2	70
11B	0	0.0	215.7	70
25Z	9.3	131.0	808.9	62.5
25A	5.8	123.3	3050.8	70
25B	6.4	66.3	1448.4	43.3
25C	7.5	107.9	1694.9	65
25D	7.2	400.6	678.0	30
25E	8.4	15.4	5701.1	90

Reference: White Pine SQT Riparian Plot Data

25G	7.5	200.3	523.9	65
25H	10.3	724.2	277.3	60
25I	9.4	69.3	3143.3	27.5

Tree density ranged from 0 to 878.3 stems per acre and average DBH ranged from 0 to 10.3 inches. Native shrub/sapling density ranged from 123.3 to 5,701.1 stems per acre and Native herbaceous cover ranged from 0 to 100 percent. A total of 18 tree species were identified with sugar maple (*Acer saccharum*) and quaking aspen (*Populus tremuloides*) being the most common. Eight shrub species were identified with speckled alder (*Alnus incana*) being the most common. Within the herbaceous layer 39 herbaceous plants were identified with Canada goldenrod (*Solidago canadensis*) being encountered most often.

Regards,

STANTEC CONSULTING SERVICES INC.

Anna Varian
Senior Environmental Scientist
Phone: (651) 683 2201
anna.varian@stantec.com

Attachment: [Table 2. Riparian Plot Data, Figure 1. Riparian Plot Locations, Photolog, Riparian Plot Data_09102024.xlsx]

Attachment A

Table 2. Riparian Plot Data

Plot ID	Strata	Common Name	*Scientific Name*	Indicator Status	Physiognomic Classification	Native/Non-Native	DBH (inches)	Stem Count	% Cover	Multistem
7-LB	Tree	American elm	*Ulmus americana*	FACW	tree	native	12.5			
7-LB	Tree	American elm	*Ulmus americana*	FACW	tree	native	4.6			
7-LB	Tree	American elm	*Ulmus americana*	FACW	tree	native	3			
7-LB	Tree	American elm	*Ulmus americana*	FACW	tree	native	7.5			
7-LB	Tree	American elm	*Ulmus americana*	FACW	tree	native	5.7			
7-LB	Tree	American elm	*Ulmus americana*	FACW	tree	native	4.5			
7-LB	Tree	American elm	*Ulmus americana*	FACW	tree	native	5			
7-LB	Tree	American elm	*Ulmus americana*	FACW	tree	native	5.5			
7-LB	Tree	balsam fir	*Abies balsamea*	FAC	tree	native	8.3			
7-LB	Tree	balsam fir	*Abies balsamea*	FAC	tree	native	13.2			
7-LB	Tree	balsam fir	*Abies balsamea*	FAC	tree	native	4.6			
7-LB	Tree	balsam fir	*Abies balsamea*	FAC	tree	native	7.7			
7-LB	Tree	balsam fir	*Abies balsamea*	FAC	tree	native	9			
7-LB	Tree	balsam fir	*Abies balsamea*	FAC	tree	native	13			
7-LB	Tree	balsam fir	*Abies balsamea*	FAC	tree	native	7.3			
7-LB	Tree	balsam fir	*Abies balsamea*	FAC	tree	native	6.5			
7-LB	Tree	balsam fir	*Abies balsamea*	FAC	tree	native	9			
7-LB	Tree	balsam fir	*Abies balsamea*	FAC	tree	native	4.5			
7-LB	Tree	balsam fir	*Abies balsamea*	FAC	tree	native	3.2			
7-LB	Tree	balsam fir	*Abies balsamea*	FAC	tree	native	3.9			
7-LB	Tree	speckled alder	*Alnus incana*	FACW	shrub	native	3.5			
7-LB	Tree	speckled alder	*Alnus incana*	FACW	shrub	native	3.4			
7-LB	Tree	speckled alder	*Alnus incana*	FACW	shrub	native	4.5			
7-LB	Tree	speckled alder	*Alnus incana*	FACW	shrub	native	3.1			
7-LB	Tree	sugar maple	*Acer saccharum*	FACU	tree	native	11.5			
7-LB	Tree	sugar maple	*Acer saccharum*	FACU	tree	native	19.5			
7-LB	Herbaceous	Canadian fly honeysuckle	*Lonicera canadensis*	FACU	shrub	native			10	
7-LB	Shrub	white ash	*Fraxinus americana*	FACU	tree	native		2		
7-LB	Shrub	speckled alder	*Alnus incana*	FACW	shrub	native		92		
7-LB	Shrub	American elm	*Ulmus americana*	FACW	Tree	native		3		
7-LB	Shrub	balsam fir	*Abies balsamea*	FAC	tree	native		11		
7-LB	Shrub	boxelder	*Acer negundo*	FAC	tree	native		1		
7-LB	Herbaceous	boxelder	*Acer negundo*	FAC	tree	native			10	
7-LB	Herbaceous	sarsaparilla	*Aralia nudicaulis*	FACU	Forb	native			20	
7-LB	Herbaceous	lady fern	*Athyrium filix-femina*	FAC	fern	native			20	
7-LB	Herbaceous	Canada goldenrod	*Solidago canadensis*	FACU	forb	native			5	
10A-RB	Tree	speckled alder	*Alnus incana*	FACW	shrub	native	3			
10A-RB	Tree	speckled alder	*Alnus incana*	FACW	shrub	native	3			
10A-RB	Tree	speckled alder	*Alnus incana*	FACW	shrub	native	3.3			
10A-RB	Tree	speckled alder	*Alnus incana*	FACW	shrub	native	3.1			
10A-RB	Tree	boxelder	*Acer negundo*	FAC	tree	native	3.5			
10A-RB	Tree	white birch	*Betula papyrifera*	FACU	tree	native	5.2			
10A-RB	Tree	white birch	*Betula papyrifera*	FACU	tree	native	4.8			
10A-RB	Tree	white birch	*Betula papyrifera*	FACU	tree	native	5.3			
10A-RB	Shrub	bebb's willow	*Salix bebbiana*	FACW	shrub	native		1		
10A-RB	Shrub	speckled alder	*Alnus incana*	FACW	shrub	native		126		
10A-RB	Shrub	sugar maple	*Acer saccharum*	FACU	tree	native		1		
10A-RB	Herbaceous	Canadian fly honeysuckle	*Lonicera canadensis*	FACU	shrub	native			5	
10A-RB	Shrub	American elm	*Ulmus americana*	FACW	tree	native		4		
10A-RB	Herbaceous	Canada goldenrod	*Solidago canadensis*	FACU	forb	native			50	
10A-RB	Herbaceous	wild strawberry	*Fragaria virginiana*	FACU	forb	native			10	

Plot ID	Strata	Common Name	*Scientific Name*	Indicator Status	Physiognomic Classification	Native/Non-Native	DBH (inches)	Stem Count	% Cover	Multistem
10B-LB	Shrub	bigtooth aspen	*Populus grandidentata*	FACU	tree	native		37		
10B-LB	Shrub	hemlock	*Tsuga canadensis*	FACU	tree	native		1		
10B-LB	Shrub	speckled alder	*Alnus incana*	FACW	shrub	native		30		
10B-LB	Shrub	boxelder	*Acer negundo*	FAC	tree	native		1		
10B-LB	Shrub	tartarian honeysuckle	*Lonicera tatarica*	FACU	shrub	non-native		12		
10B-LB	Herbaceous	Canada goldenrod	*Solidago canadensis*	FACU	forb	native			30	
10B-LB	Herbaceous	red raspberry	*Rubus strigosus*	FAC	shrub	native			10	
10B-LB	Herbaceous	Kentucky bluegrass	*Poa pratensis*	FACU	grass	non-native			30	
10B-LB	Herbaceous	timothy	*Phleum pratense*	FACU	grass	non-native			20	
10B-LB	Herbaceous	queen Anne's lace	*Daucus carota*	UPL	forb	non-native			10	
10B-LB	Herbaceous	birdfoot trefoil	*Lotus corniculatus*	FACU	forb	non-native			20	
10B-LB	Herbaceous	white clover	*Trifolium repens*	FACU	forb	non-native			3	
10C-LB	Tree	hemlock	*Tsuga canadensis*	FACU	tree	native	14.7			
10C-LB	Tree	hemlock	*Tsuga canadensis*	FACU	tree	native	11			
10C-LB	Tree	hemlock	*Tsuga canadensis*	FACU	tree	native	9.4			
10C-LB	Tree	hemlock	*Tsuga canadensis*	FACU	tree	native	17.5			
10C-LB	Tree	hemlock	*Tsuga canadensis*	FACU	tree	native	13			
10C-LB	Tree	hemlock	*Tsuga canadensis*	FACU	tree	native	11			
10C-LB	Tree	hemlock	*Tsuga canadensis*	FACU	tree	native	10.5			
10C-LB	Tree	hemlock	*Tsuga canadensis*	FACU	tree	native	8			
10C-LB	Tree	hemlock	*Tsuga canadensis*	FACU	tree	native	9.5			
10C-LB	Tree	hemlock	*Tsuga canadensis*	FACU	tree	native	3			
10C-LB	Tree	hemlock	*Tsuga canadensis*	FACU	tree	native	7.47			
10C-LB	Tree	hemlock	*Tsuga canadensis*	FACU	tree	native	18.8			
10C-LB	Tree	hemlock	*Tsuga canadensis*	FACU	tree	native	10.5			
10C-LB	Tree	hemlock	*Tsuga canadensis*	FACU	tree	native	4.5			
10C-LB	Tree	hemlock	*Tsuga canadensis*	FACU	tree	native	19.2			
10C-LB	Tree	hemlock	*Tsuga canadensis*	FACU	tree	native	8.3			
10C-LB	Tree	hemlock	*Tsuga canadensis*	FACU	tree	native	6.8			
10C-LB	Tree	hemlock	*Tsuga canadensis*	FACU	tree	native	12.4			
10C-LB	Tree	hemlock	*Tsuga canadensis*	FACU	tree	native	12.5			
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10C-LB	Tree	hemlock	*Tsuga canadensis*	FACU	tree	native	6.5			1
10C-LB	Tree	hemlock	*Tsuga canadensis*	FACU	tree	native	8.4			1
10C-LB	Tree	hemlock	*Tsuga canadensis*	FACU	tree	native	14			
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10C-LB	Tree	hemlock	*Tsuga canadensis*	FACU	tree	native	8.5			
10C-LB	Tree	hemlock	*Tsuga canadensis*	FACU	tree	native	8.5			
10C-LB	Tree	hemlock	*Tsuga canadensis*	FACU	tree	native	7.5			
10C-LB	Tree	hemlock	*Tsuga canadensis*	FACU	tree	native	21			
10C-LB	Tree	hemlock	*Tsuga canadensis*	FACU	tree	native	8.8			1
10C-LB	Tree	hemlock	*Tsuga canadensis*	FACU	tree	native	3.5			1
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10C-LB	Tree	hemlock	*Tsuga canadensis*	FACU	tree	native	5.4			
10C-LB	Tree	hemlock	*Tsuga canadensis*	FACU	tree	native	8			
10C-LB	Tree	hemlock	*Tsuga canadensis*	FACU	tree	native	8.9			
10C-LB	Tree	hemlock	*Tsuga canadensis*	FACU	tree	native	6.9			
10C-LB	Tree	hemlock	*Tsuga canadensis*	FACU	tree	native	6.4			
10C-LB	Tree	hemlock	*Tsuga canadensis*	FACU	tree	native	8.9			
10C-LB	Tree	hemlock	*Tsuga canadensis*	FACU	tree	native	13.3			
10C-LB	Tree	hemlock	*Tsuga canadensis*	FACU	tree	native	4.8			

Plot ID	Strata	Common Name	*Scientific Name*	Indicator Status	Physiognomic Classification	Native/Non-Native	DBH (inches)	Stem Count	% Cover	Multistem
10C-LB	Tree	hemlock	*Tsuga canadensis*	FACU	tree	native	7.6			
10C-LB	Tree	hemlock	*Tsuga canadensis*	FACU	tree	native	8			
10C-LB	Tree	hemlock	*Tsuga canadensis*	FACU	tree	native	3.4			
10C-LB	Tree	hemlock	*Tsuga canadensis*	FACU	tree	native	16.2			
10C-LB	Tree	sugar maple	*Acer saccharum*	FACU	tree	native	16.5			
10C-LB	Tree	sugar maple	*Acer saccharum*	FACU	tree	native	4.6			
10C-LB	Tree	sugar maple	*Acer saccharum*	FACU	tree	native	5.4			
10C-LB	Tree	sugar maple	*Acer saccharum*	FACU	tree	native	4.5			
10C-LB	Tree	sugar maple	*Acer saccharum*	FACU	tree	native	6.1			
10C-LB	Tree	sugar maple	*Acer saccharum*	FACU	tree	native	7			
10C-LB	Tree	sugar maple	*Acer saccharum*	FACU	tree	native	5.9			
10C-LB	Tree	sugar maple	*Acer saccharum*	FACU	tree	native	6.7			
10C-LB	Tree	balsam fir	*Abies balsamea*	FAC	tree	native	3.5			
10C-LB	Tree	balsam fir	*Abies balsamea*	FAC	tree	native	3.8			
10C-LB	Tree	yellow birch	*Betula alleghaniensis*	FAC	tree	native	8.3			
10C-LB	Tree	yellow birch	*Betula alleghaniensis*	FAC	tree	native	6.7			
10C-LB	Tree	yellow birch	*Betula alleghaniensis*	FAC	tree	native	9.9			
10C-LB	Tree	yellow birch	*Betula alleghaniensis*	FAC	tree	native	9.4			2
10C-LB	Shrub	balsam fir	*Abies balsamea*	FAC	tree	native		39		2
10C-LB	Shrub	hemlock	*Tsuga canadensis*	FACU	tree	native		6		
11A-LB	Tree	boxelder	*Acer negundo*	FAC	tree	native	3			
11A-LB	Tree	boxelder	*Acer negundo*	FAC	tree	native	3.7			
11A-LB	Tree	boxelder	*Acer negundo*	FAC	tree	native	7			
11A-LB	Tree	boxelder	*Acer negundo*	FAC	tree	native	3			
11A-LB	Tree	boxelder	*Acer negundo*	FAC	tree	native	4			
11A-LB	Tree	boxelder	*Acer negundo*	FAC	tree	native	3.3			1
11A-LB	Tree	boxelder	*Acer negundo*	FAC	tree	native	3.1			1
11A-LB	Tree	balsam fir	*Abies balsamea*	FAC	tree	native	12.8			
11A-LB	Tree	quaking aspen	*Populus tremuloides*	FAC	tree	native	5.6			
11A-LB	Tree	quaking aspen	*Populus tremuloides*	FAC	tree	native	5.5			
11A-LB	Tree	quaking aspen	*Populus tremuloides*	FAC	tree	native	6.5			
11A-LB	Tree	quaking aspen	*Populus tremuloides*	FAC	tree	native	3.1			
11A-LB	Tree	quaking aspen	*Populus tremuloides*	FAC	tree	native	3.5			
11A-LB	Tree	quaking aspen	*Populus tremuloides*	FAC	tree	native	6.5			
11A-LB	Tree	quaking aspen	*Populus tremuloides*	FAC	tree	native	4			
11A-LB	Tree	quaking aspen	*Populus tremuloides*	FAC	tree	native	4.2			
11A-LB	Tree	quaking aspen	*Populus tremuloides*	FAC	tree	native	3.6			
11A-LB	Tree	quaking aspen	*Populus tremuloides*	FAC	tree	native	5.6			
11A-LB	Tree	quaking aspen	*Populus tremuloides*	FAC	tree	native	4.8			
11A-LB	Tree	quaking aspen	*Populus tremuloides*	FAC	tree	native	4			

Plot ID	Strata	Common Name	*Scientific Name*	Indicator Status	Physiognomic Classification	Native/Non-Native	DBH (inches)	Stem Count	% Cover	Multistem
11A-LB	Tree	quaking aspen	*Populus tremuloides*	FAC	tree	native	9			
11A-LB	Tree	quaking aspen	*Populus tremuloides*	FAC	tree	native	4			
11A-LB	Tree	quaking aspen	*Populus tremuloides*	FAC	tree	native	5.4			
11A-LB	Tree	quaking aspen	*Populus tremuloides*	FAC	tree	native	5.5			
11A-LB	Tree	quaking aspen	*Populus tremuloides*	FAC	tree	native	4			
11A-LB	Tree	quaking aspen	*Populus tremuloides*	FAC	tree	native	4.5			
11A-LB	Tree	quaking aspen	*Populus tremuloides*	FAC	tree	native	5			
11A-LB	Tree	quaking aspen	*Populus tremuloides*	FAC	tree	native	7.1			
11A-LB	Tree	yellow birch	*Betula alleghaniensis*	FAC	tree	native	9			
11A-LB	Tree	yellow birch	*Betula alleghaniensis*	FAC	tree	native	4			
11A-LB	Tree	bebb's willow	*Salix bebbiana*	FACW	shrub	native	3.1			
11A-LB	Tree	bebb's willow	*Salix bebbiana*	FACW	shrub	native	3.2			
11A-LB	Shrub	boxelder	*Acer negundo*	FAC	tree	native		6		
11A-LB	Shrub	balsam fir	*Abies balsamea*	FAC	tree	native		5		
11A-LB	Shrub	quaking aspen	*Populus tremuloides*	FAC	tree	native		4		
11A-LB	Shrub	beaked hazel	*Corylus cornuta*	FACU	shrub	native		6		
11A-LB	Shrub	yellow birch	*Betula alleghaniensis*	FAC	tree	native		1		
11A-LB	Shrub	bebb's willow	*Salix bebbiana*	FACW	shrub	native		3		
11A-LB	Herbaceous	cinnamon fern	*Osmundastrum cinnamomeum*	FACW	fern	native			60	
11A-LB	Herbaceous	sarsaparilla	*Aralia nudicaulis*	FACU	forb	native			10	
11B-LB	Shrub	beaked hazel	*Corylus cornuta*	FACU	shrub	native		5		
11B-LB	Shrub	boxelder	*Acer negundo*	FAC	tree	native		3		
11B-LB	Shrub	red berried elder	*Sambucus racemosa*	FACU	shrub	native		6		
11B-LB	Herbaceous	thimbleberry	*Rubus parviflorus*	FACU	shrub	native			70	
1A-LB	Tree	quaking aspen	*Populus tremuloides*	FAC	tree	native	5			
1A-LB	Tree	quaking aspen	*Populus tremuloides*	FAC	tree	native	4.2			
1A-LB	Tree	quaking aspen	*Populus tremuloides*	FAC	tree	native	4.7			
1A-LB	Tree	quaking aspen	*Populus tremuloides*	FAC	tree	native	3.8			
1A-LB	Tree	quaking aspen	*Populus tremuloides*	FAC	tree	native	4.4			
1A-LB	Tree	quaking aspen	*Populus tremuloides*	FAC	tree	native	4.4			
1A-LB	Tree	quaking aspen	*Populus tremuloides*	FAC	tree	native	3.2			
1A-LB	Tree	quaking aspen	*Populus tremuloides*	FAC	tree	native	3.1			
1A-LB	Tree	quaking aspen	*Populus tremuloides*	FAC	tree	native	3.1			

Plot ID	Strata	Common Name	*Scientific Name*	Indicator Status	Physiognomic Classification	Native/Non-Native	DBH (inches)	Stem Count	% Cover	Multistem
1A-LB	Tree	quaking aspen	*Populus tremuloides*	FAC	tree	native	5.2			
1A-LB	Tree	quaking aspen	*Populus tremuloides*	FAC	tree	native	4.3			
1A-LB	Tree	quaking aspen	*Populus tremuloides*	FAC	tree	native	3.5			
1A-LB	Tree	quaking aspen	*Populus tremuloides*	FAC	tree	native	4.4			
1A-LB	Shrub	white birch	*Betula papyrifera*	FACU	tree	native		3		1
1A-LB	Shrub	quaking aspen	*Populus tremuloides*	FAC	tree	native		20		1
1A-LB	Shrub	willow	*Salix eriocephala*	FACW	shrub	native		99		
1A-LB	Shrub	yellow birch	*Betula alleghaniensis*	FAC	tree	native		3		
1A-LB	Herbaceous	woodland horsetail	*Equisetum sylvaticum*	FACW	fern	native			50	
1A-LB	Herbaceous	white cedar	*Thuja occidentalis*	FACW	tree	native			10	
1A-LB	Herbaceous	white clover	*Trifolium repens*	FACU	forb	non-native			10	
1A-LB	Herbaceous	Canada goldenrod	*Solidago canadensis*	FACU	forb	native			5	
1A-LB	Herbaceous	birdfoot trefoil	*Lotus corniculatus*	FACU	forb	non-native			5	
1B-LB	Tree	white ash	*Fraxinus americana*	FACU	tree	native	20.7			
1B-LB	Tree	balsam fir	*Abies balsamea*	FAC	tree	native	4.8			
1B-LB	Tree	white birch	*Betula papyrifera*	FACU	tree	native	5.7			
1B-LB	Tree	quaking aspen	*Populus tremuloides*	FAC	tree	native	10.5			
1B-LB	Tree	quaking aspen	*Populus tremuloides*	FAC	tree	native	4.6			
1B-LB	Tree	quaking aspen	*Populus tremuloides*	FAC	tree	native	10			
1B-LB	Tree	quaking aspen	*Populus tremuloides*	FAC	tree	native	3.1			
1B-LB	Tree	quaking aspen	*Populus tremuloides*	FAC	tree	native	9.3			
1B-LB	Tree	quaking aspen	*Populus tremuloides*	FAC	tree	native	6.5			
1B-LB	Tree	quaking aspen	*Populus tremuloides*	FAC	tree	native	11			
1B-LB	Tree	quaking aspen	*Populus tremuloides*	FAC	tree	native	7.9			
1B-LB	Tree	quaking aspen	*Populus tremuloides*	FAC	tree	native	10.9			
1B-LB	Tree	quaking aspen	*Populus tremuloides*	FAC	tree	native	4.2			
1B-LB	Tree	quaking aspen	*Populus tremuloides*	FAC	tree	native	7			
1B-LB	Tree	quaking aspen	*Populus tremuloides*	FAC	tree	native	10.9			
1B-LB	Tree	red maple	*Acer rubrum*	FAC	tree	native	4.3			
1B-LB	Tree	white birch	*Betula papyrifera*	FACU	tree	native	6			
1B-LB	Tree	white birch	*Betula papyrifera*	FACU	tree	native	3.2			
1B-LB	Tree	white birch	*Betula papyrifera*	FACU	tree	native	4			
1B-LB	Tree	white birch	*Betula papyrifera*	FACU	tree	native	3			
1B-LB	Tree	white birch	*Betula papyrifera*	FACU	tree	native	3.4			
1B-LB	Tree	white birch	*Betula papyrifera*	FACU	tree	native	6			

Plot ID	Strata	Common Name	*Scientific Name*	Indicator Status	Physiognomic Classification	Native/Non-Native	DBH (inches)	Stem Count	% Cover	Multistem
1B-LB	Shrub	white ash	*Fraxinus americana*	FACU	tree	native		1		
1B-LB	Shrub	white birch	*Betula papyrifera*	FACU	tree	native		5		
1B-LB	Shrub	quaking aspen	*Populus tremuloides*	FAC	tree	native		12		
1B-LB	Shrub	red oak	*Quercus rubra*	FACU	tree	native		1		1
1B-LB	Shrub	speckled alder	*Alnus incana*	FACW	shrub	native		3		1
1B-LB	Shrub	balsam fir	*Abies balsamea*	FAC	tree	native		1		1
1B-LB	Shrub	yellow birch	*Betula alleghaniensis*	FAC	tree	native		2		
1B-LB	Shrub	willow	*Salix eriocephala*	FACW	shrub	native		21		
1B-LB	Herbaceous	woodland horsetail	*Equisetum sylvaticum*	FACW	fern	native			20	
1B-LB	Herbaceous	boxelder	*Acer negundo*	FAC	tree	native			15	
1B-LB	Herbaceous	birdfoot trefoil	*Lotus corniculatus*	FACU	forb	non-native			10	
25A-LB	Tree	quaking aspen	*Populus tremuloides*	FAC	tree	native	9.4			
25A-LB	Tree	quaking aspen	*Populus tremuloides*	FAC	tree	native	6.4			
25A-LB	Tree	quaking aspen	*Populus tremuloides*	FAC	tree	native	4.5			
25A-LB	Tree	quaking aspen	*Populus tremuloides*	FAC	tree	native	5.1			
25A-LB	Tree	sugar maple	*Acer saccharum*	FACU	tree	native	4			
25A-LB	Tree	sugar maple	*Acer saccharum*	FACU	tree	native	4.3			
25A-LB	Tree	sugar maple	*Acer saccharum*	FACU	tree	native	5.2			
25A-LB	Tree	sugar maple	*Acer saccharum*	FACU	tree	native	7.1			
25A-LB	Shrub	speckled alder	*Alnus incana*	FACW	shrub	native		148		
25A-LB	Shrub	sugar maple	*Acer saccharum*	FACU	tree	native		25		
25A-LB	Shrub	serviceberry	*Amelanchier interior*	UPL	shrub	native		24		
25A-LB	Shrub	yellow birch	*Betula alleghaniensis*	FAC	tree	native		1		
25A-LB	Herbaceous	wild strawberry	*Fragaria virginiana*	FACU	forb	native			30	
25A-LB	Herbaceous	sarsaparilla	*Aralia nudicaulis*	FACU	Forb	native			20	
25A-LB	Herbaceous	common dandelion	*Taraxacum officinale*	FACU	forb	non-native			10	
25A-LB	Herbaceous	pearly everlasting	*Anaphalis margaritacea*	UPL	forb	native			5	
25A-LB	Herbaceous	Canada goldenrod	*Solidago canadensis*	FACU	forb	native			5	
25A-LB	Herbaceous	sugar maple	*Acer saccharum*	FACU	tree	native			10	
25B-LB	Tree	American elm	*Ulmus americana*	FACW	Tree	native	20			
25B-LB	Tree	American elm	*Ulmus americana*	FACW	Tree	native	7.5			
25B-LB	Tree	American elm	*Ulmus americana*	FACW	Tree	native	15.5			
25B-LB	Tree	black cherry	*Prunus serotina*	FACU	tree	native	8			
25B-LB	Shrub	white ash	*Fraxinus americana*	FACU	tree	native		3		
25B-LB	Shrub	American elm	*Ulmus americana*	FACW	tree	native		1		
25B-LB	Shrub	black cherry	*Prunus serotina*	FACU	tree	native		1		
25B-LB	Herbaceous	common milkweed	*Asclepias syriaca*	UPL	forb	native			50	
25B-LB	Herbaceous	Canada goldenrod	*Solidago canadensis*	FACU	forb	native			50	
25B-LB2	Tree	speckled alder	*Alnus incana*	FACW	shrub	native	3.5			
25B-LB2	Tree	speckled alder	*Alnus incana*	FACW	shrub	native	5			
25B-LB2	Tree	speckled alder	*Alnus incana*	FACW	shrub	native	3.1			

Plot ID	Strata	Common Name	*Scientific Name*	Indicator Status	Physiognomic Classification	Native/Non-Native	DBH (inches)	Stem Count	% Cover	Multistem
25B-LB2	Tree	speckled alder	*Alnus incana*	FACW	shrub	native	3.2			
25B-LB2	Tree	speckled alder	*Alnus incana*	FACW	shrub	native	3			
25B-LB2	Tree	speckled alder	*Alnus incana*	FACW	shrub	native	3			
25B-LB2	Tree	speckled alder	*Alnus incana*	FACW	shrub	native	3.1			
25B-LB2	Tree	speckled alder	*Alnus incana*	FACW	shrub	native	4			
25B-LB2	Tree	speckled alder	*Alnus incana*	FACW	shrub	native	3.8			
25B-LB2	Shrub	speckled alder	*Alnus incana*	FACW	shrub	native		233		
25B-LB2	Herbaceous	Canadian fly honeysuckle	*Lonicera canadensis*	FACU	shrub	native		10		
25B-LB2	Herbaceous	Canada goldenrod	*Solidago canadensis*	FACU	forb	native		5		
25B-LB2	Herbaceous	smooth pussytoes	*Antennaria parlinii*	UPL	forb	native		5		
25B-RB	Shrub	speckled alder	*Alnus incana*	FACW	shrub	native		25		
25B-RB	Herbaceous	reed canary grass	*Phalaris arundinacea*	FACW	grass	native			30	
25B-RB	Herbaceous	cattail	*Typha Ã—glauca*	OBL	forb	non-native			70	
25C-RB	Tree	white ash	*Fraxinus americana*	FACU	tree	native	7.3			
25C-RB	Tree	white ash	*Fraxinus americana*	FACU	tree	native	9			
25C-RB	Tree	sugar maple	*Acer saccharum*	FACU	tree	native	6.4			
25C-RB	Tree	sugar maple	*Acer saccharum*	FACU	tree	native	5.6			
25C-RB	Tree	American elm	*Ulmus americana*	FACW	tree	native	7			
25C-RB	Tree	American elm	*Ulmus americana*	FACW	tree	native	5			
25C-RB	Tree	red maple	*Acer rubrum*	FAC	tree	native	10			
25C-RB	Tree	yellow birch	*Betula alleghaniensis*	FAC	tree	native	9.3			
25C-RB	Shrub	speckled alder	*Alnus incana*	FACW	shrub	native		33		
25C-RB	Shrub	serviceberry	*Amelanchier interior*	UPL	shrub	native		2		
25C-RB	Shrub	quaking aspen	*Populus tremuloides*	FAC	tree	native		1		
25C-RB	Shrub	sugar maple	*Acer saccharum*	FACU	tree	native		74		
25C-RB	Herbaceous	Sedge	*Carex peckii*	UPL	sedge	native			5	
25C-RB	Herbaceous	speckled alder	*Alnus incana*	FACW	shrub	native			20	1
25C-RB	Herbaceous	sugar maple	*Acer saccharum*	FACU	tree	native			20	1
25C-RB	Herbaceous	grass-leaved goldenrod	*Euthamia graminifolia*	FAC	forb	native			5	
25C-RB	Herbaceous	wild strawberry	*Fragaria virginiana*	FACU	forb	native			15	2
25D-LB	Tree	white ash	*Fraxinus americana*	FACU	tree	native	16			2
25D-LB	Tree	sugar maple	*Acer saccharum*	FACU	tree	native	4.1			
25D-LB	Tree	sugar maple	*Acer saccharum*	FACU	tree	native	8.7			
25D-LB	Tree	sugar maple	*Acer saccharum*	FACU	tree	native	4.6			
25D-LB	Tree	sugar maple	*Acer saccharum*	FACU	tree	native	6.2			
25D-LB	Tree	sugar maple	*Acer saccharum*	FACU	tree	native	5			
25D-LB	Tree	sugar maple	*Acer saccharum*	FACU	tree	native	6.6			
25D-LB	Tree	sugar maple	*Acer saccharum*	FACU	tree	native	6.3			
25D-LB	Tree	sugar maple	*Acer saccharum*	FACU	tree	native	8			
25D-LB	Tree	sugar maple	*Acer saccharum*	FACU	tree	native	3.5			
25D-LB	Tree	sugar maple	*Acer saccharum*	FACU	tree	native	3.9			
25D-LB	Tree	sugar maple	*Acer saccharum*	FACU	tree	native	4.3			
25D-LB	Tree	sugar maple	*Acer saccharum*	FACU	tree	native	7.2			
25D-LB	Tree	sugar maple	*Acer saccharum*	FACU	tree	native	15.4			
25D-LB	Tree	sugar maple	*Acer saccharum*	FACU	tree	native	9			
25D-LB	Tree	sugar maple	*Acer saccharum*	FACU	tree	native	4			

Plot ID	Strata	Common Name	*Scientific Name*	Indicator Status	Physiognomic Classification	Native/Non-Native	DBH (inches)	Stem Count	% Cover	Multistem
25D-LB	Tree	sugar maple	*Acer saccharum*	FACU	tree	native	6			
25D-LB	Tree	sugar maple	*Acer saccharum*	FACU	tree	native	9.4			
25D-LB	Tree	sugar maple	*Acer saccharum*	FACU	tree	native	10.5			
25D-LB	Tree	sugar maple	*Acer saccharum*	FACU	tree	native	9.3			
25D-LB	Tree	sugar maple	*Acer saccharum*	FACU	tree	native	4.8			
25D-LB	Tree	sugar maple	*Acer saccharum*	FACU	tree	native	9.8			
25D-LB	Tree	sugar maple	*Acer saccharum*	FACU	tree	native	3			
25D-LB	Tree	sugar maple	*Acer saccharum*	FACU	tree	native	4.7			
25D-LB	Tree	sugar maple	*Acer saccharum*	FACU	tree	native	8.75			
25D-LB	Tree	sugar maple	*Acer saccharum*	FACU	tree	native	7.2			
25D-LB	Shrub	sugar maple	*Acer saccharum*	FACU	tree	native		44		
25D-LB	Herbaceous	sugar maple	*Acer saccharum*	FACU	tree	native			30	
25E-LB	Tree	yellow birch	*Betula alleghaniensis*	FAC	tree	native	9.6			
25E-LB	Tree	yellow birch	*Betula alleghaniensis*	FAC	tree	native	9			
25E-LB	Tree	yellow birch	*Betula alleghaniensis*	FAC	tree	native	6.5			
25E-LB	Shrub	white ash	*Fraxinus americana*	FACU	tree	native		3		
25E-LB	Shrub	speckled alder	*Alnus incana*	FACW	shrub	native		367		
25E-LB	Herbaceous	joe-pye-weed	*Eutrochium maculatum*	OBL	forb	native			20	
25E-LB	Herbaceous	red raspberry	*Rubus strigosus*	FAC	shrub	native			20	
25E-LB	Herbaceous	grass-leaved goldenrod	*Euthamia graminifolia*	FAC	forb	native			10	
25E-LB	Herbaceous	Canada anemone	*Anemone canadensis*	FACW	forb	native			40	
25G-LB	Tree	black cherry	*Prunus serotina*	FACU	tree	native	5			
25G-LB	Tree	black cherry	*Prunus serotina*	FACU	tree	native	4.5			3
25G-LB	Tree	black cherry	*Prunus serotina*	FACU	tree	native	5			3
25G-LB	Tree	sugar maple	*Acer saccharum*	FACU	tree	native	10.6			3
25G-LB	Tree	red maple	*Acer rubrum*	FAC	tree	native	11			
25G-LB	Tree	red maple	*Acer rubrum*	FAC	tree	native	3.75			
25G-LB	Tree	red maple	*Acer rubrum*	FAC	tree	native	4			
25G-LB	Tree	red maple	*Acer rubrum*	FAC	tree	native	4.8			
25G-LB	Tree	red maple	*Acer rubrum*	FAC	tree	native	7.6			
25G-LB	Tree	red maple	*Acer rubrum*	FAC	tree	native	6			
25G-LB	Tree	red maple	*Acer rubrum*	FAC	tree	native	18			
25G-LB	Tree	red maple	*Acer rubrum*	FAC	tree	native	3.5			
25G-LB	Tree	red maple	*Acer rubrum*	FAC	tree	native	13.4			
25G-LB	Tree	red maple	*Acer rubrum*	FAC	tree	native	5			1
25G-LB	Tree	white birch	*Betula papyrifera*	FACU	tree	native	11			1
25G-LB	Tree	white birch	*Betula papyrifera*	FACU	tree	native	6.1			2
25G-LB	Tree	white birch	*Betula papyrifera*	FACU	tree	native	3			2
25G-LB	Shrub	white ash	*Fraxinus americana*	FACU	tree	native		48		2
25G-LB	Shrub	speckled alder	*Alnus incana*	FACW	shrub	native		2		
25G-LB	Shrub	red maple	*Acer rubrum*	FAC	tree	native		4		1
25G-LB	Shrub	serviceberry	*Amelanchier interior*	UPL	shrub	native		4		1
25G-LB	Shrub	white birch	*Betula papyrifera*	FACU	tree	native		1		
25G-LB	Herbaceous	white ash	*Fraxinus americana*	FACU	tree	native			30	
25G-LB	Herbaceous	speckled alder	*Alnus incana*	FACW	shrub	native			10	
25G-LB	Herbaceous	common dandelion	*Taraxacum officinale*	FACU	forb	non-native			10	

Plot ID	Strata	Common Name	*Scientific Name*	Indicator Status	Physiognomic Classification	Native/Non-Native	DBH (inches)	Stem Count	% Cover	Multistem
25G-LB	Herbaceous	sensitive fern	*Onoclea sensibilis*	FACW	fern	native			5	
25G-RB	Tree	white ash	*Fraxinus americana*	FACU	tree	native	8.8			
25G-RB	Tree	white ash	*Fraxinus americana*	FACU	tree	native	11.4			
25G-RB	Tree	white ash	*Fraxinus americana*	FACU	tree	native	3.2			
25G-RB	Tree	white ash	*Fraxinus americana*	FACU	tree	native	8.4			
25G-RB	Tree	black cherry	*Prunus serotina*	FACU	tree	native	12			
25G-RB	Tree	black cherry	*Prunus serotina*	FACU	tree	native	8.3			
25G-RB	Tree	black cherry	*Prunus serotina*	FACU	tree	native	8.6			1
25G-RB	Tree	red maple	*Acer rubrum*	FAC	tree	native	4.1			
25G-RB	Tree	red maple	*Acer rubrum*	FAC	tree	native	9			
25G-RB	Shrub	red maple	*Acer rubrum*	FAC	tree	native		7		
25G-RB	Shrub	white ash	*Fraxinus americana*	FACU	tree	native		2		
25G-RB	Herbaceous	Canada bluejoint	*Calamagrostis canadensis*	OBL	grass	native			50	
25G-RB	Herbaceous	stinging nettle	*Urtica dioica*	FAC	forb	native			20	
25G-RB	Herbaceous	curly dock	*Rumex crispus*	FAC	forb	non-native			20	
25G-RB	Herbaceous	reed manna grass	*Glyceria grandis*	OBL	grass	native			10	1
25G-RB	Herbaceous	flat topped aster	*Doellingeria umbellata*	FACW	forb	native			5	1
25H-LB	Tree	sugar maple	*Acer saccharum*	FACU	tree	native	11.2			1
25H-LB	Tree	sugar maple	*Acer saccharum*	FACU	tree	native	11.2			
25H-LB	Tree	sugar maple	*Acer saccharum*	FACU	tree	native	5.6			
25H-LB	Tree	sugar maple	*Acer saccharum*	FACU	tree	native	10.7			
25H-LB	Tree	sugar maple	*Acer saccharum*	FACU	tree	native	14			
25H-LB	Tree	sugar maple	*Acer saccharum*	FACU	tree	native	3			
25H-LB	Tree	sugar maple	*Acer saccharum*	FACU	tree	native	10.25			
25H-LB	Tree	sugar maple	*Acer saccharum*	FACU	tree	native	4.7			
25H-LB	Tree	sugar maple	*Acer saccharum*	FACU	tree	native	8.5			
25H-LB	Tree	sugar maple	*Acer saccharum*	FACU	tree	native	11.6			1
25H-LB	Tree	yellow birch	*Betula alleghaniensis*	FAC	tree	native	11.4			1
25H-LB	Tree	yellow birch	*Betula alleghaniensis*	FAC	tree	native	20			
25H-LB	Tree	yellow birch	*Betula alleghaniensis*	FAC	tree	native	6.3			
25H-LB	Tree	yellow birch	*Betula alleghaniensis*	FAC	tree	native	6.1			
25H-LB	Tree	yellow birch	*Betula alleghaniensis*	FAC	tree	native	13.5			
25H-LB	Tree	yellow birch	*Betula alleghaniensis*	FAC	tree	native	15.5			2
25H-LB	Tree	yellow birch	*Betula alleghaniensis*	FAC	tree	native	10.8			2
25H-LB	Shrub	serviceberry	*Amelanchier interior*	UPL	shrub	native		4		
25H-LB	Shrub	beaked hazel	*Corylus cornuta*	FACU	shrub	native		12		
25H-LB	Shrub	speckled alder	*Alnus incana*	FACW	shrub	native		2		3
25H-LB	Herbaceous	serviceberry	*Amelanchier interior*	UPL	shrub	native			5	3
25H-LB	Herbaceous	sugar maple	*Acer saccharum*	FACU	tree	native			5	

Plot ID	Strata	Common Name	*Scientific Name*	Indicator Status	Physiognomic Classification	Native/Non-Native	DBH (inches)	Stem Count	% Cover	Multistem
25H-LB	Herbaceous	bracken fern	*Pteridium aquilinum*	FACU	fern	native			40	
25H-LB	Herbaceous	sarsaparilla	*Aralia nudicaulis*	FACU	Forb	native			10	
25I-LB	Tree	speckled alder	*Alnus incana*	FACW	shrub	native	4.6			
25I-LB	Tree	speckled alder	*Alnus incana*	FACW	shrub	native	3.25			
25I-LB	Tree	yellow birch	*Betula alleghaniensis*	FAC	tree	native	3.25			
25I-LB	Shrub	speckled alder	*Alnus incana*	FACW	shrub	native		186		
25I-LB	Shrub	willow spp	*Salix spp*		shrub	native		11		
25I-LB	Shrub	yellow birch	*Betula alleghaniensis*	FAC	tree	native		8		
25I-LB	Herbaceous	sedge	*Carex peckii*	UPL	sedge	native			20	
25I-LB	Herbaceous	Canadian fly honeysuckle	*Lonicera canadensis*	FACU	shrub	native			15	
25I-LB	Herbaceous	grass-leaved goldenrod	*Euthamia graminifolia*	FAC	forb	native			5	
25I-LB	Herbaceous	common burdock	*Arctium minus*	FACU	forb	non-native			10	
25I-LB	Herbaceous	red raspberry	*Rubus strigosus*	FAC	shrub	native			10	
25I-RB	Tree	black ash	*Fraxinus nigra*	FACW	tree	native	17.5			
25I-RB	Tree	black ash	*Fraxinus nigra*	FACW	tree	native	14.75			
25I-RB	Tree	black ash	*Fraxinus nigra*	FACW	tree	native	15.25			
25I-RB	Tree	basswood	*Tilia americana*	FACU	tree	native	16			
25I-RB	Tree	black cherry	*Prunus serotina*	FACU	tree	native	5.9			
25I-RB	Tree	speckled alder	*Alnus incana*	FACW	shrub	native	4.25			
25I-RB	Shrub	basswood	*Tilia americana*	FACU	tree	native		6		
25I-RB	Shrub	speckled alder	*Alnus incana*	FACW	shrub	native		104		1
25I-RB	Shrub	quaking aspen	*Populus tremuloides*	FAC	tree	native		13		1
25I-RB	Herbaceous	Canadian fly honeysuckle	*Lonicera canadensis*	FACU	shrub	native			5	1
25I-RB	Herbaceous	interrupted fern	*Osmunda claytoniana*	FAC	fern	native		80		
25Z-LB	Tree	sugar maple	*Acer saccharum*	FACU	tree	native	15.5			2
25Z-LB	Tree	sugar maple	*Acer saccharum*	FACU	tree	native	6.8			2
25Z-LB	Tree	sugar maple	*Acer saccharum*	FACU	tree	native	19.5			
25Z-LB	Tree	sugar maple	*Acer saccharum*	FACU	tree	native	7			
25Z-LB	Tree	sugar maple	*Acer saccharum*	FACU	tree	native	13			
25Z-LB	Tree	sugar maple	*Acer saccharum*	FACU	tree	native	9			
25Z-LB	Tree	sugar maple	*Acer saccharum*	FACU	tree	native	2			
25Z-LB	Tree	sugar maple	*Acer saccharum*	FACU	tree	native	30			
25Z-LB	Tree	sugar maple	*Acer saccharum*	FACU	tree	native	4.5			
25Z-LB	Tree	sugar maple	*Acer saccharum*	FACU	tree	native	10.6			
25Z-LB	Tree	sugar maple	*Acer saccharum*	FACU	tree	native	5.9			
25Z-LB	Tree	ironwood	*Ostrya virginiana*	FACU	tree	native	5			
25Z-LB	Tree	yellow birch	*Betula alleghaniensis*	FAC	tree	native	11.6			
25Z-LB	Tree	yellow birch	*Betula alleghaniensis*	FAC	tree	native	10.3			
25Z-LB	Tree	yellow birch	*Betula alleghaniensis*	FAC	tree	native	7.4			
25Z-LB	Shrub	white ash	*Fraxinus americana*	FACU	tree	native		1		
25Z-LB	Shrub	sugar maple	*Acer saccharum*	FACU	tree	native		42		
25Z-LB	Herbaceous	evergreen woodfern	*Dryopteris intermedia*	FAC	fern	native			10	
25Z-LB	Herbaceous	Canada thistle	*Cirsium arvense*	FACU	forb	non-native			10	

Plot ID	Strata	Common Name	*Scientific Name*	Indicator Status	Physiognomic Classification	Native/Non-Native	DBH (inches)	Stem Count	% Cover	Multistem
25Z-LB	Herbaceous	blackberry	*Rubus allegheniensis*	FACU	shrub	native			5	
25Z-LB	Herbaceous	sarsaparilla	*Aralia nudicaulis*	FACU	Forb	native			20	
25Z-LB	Herbaceous	wild columbine	*Aquilegia canadensis*	FACU	forb	native			10	
25Z-LB	Herbaceous	Canada anemone	*Anemone canadensis*	FACW	forb	native			30	
25Z-RB	Tree	sugar maple	*Acer saccharum*	FACU	tree	native	3.3			
25Z-RB	Tree	sugar maple	*Acer saccharum*	FACU	tree	native	4.4			
25Z-RB	Tree	sugar maple	*Acer saccharum*	FACU	tree	native	3.5			
25Z-RB	Tree	sugar maple	*Acer saccharum*	FACU	tree	native	10.75			
25Z-RB	Tree	sugar maple	*Acer saccharum*	FACU	tree	native	3.75			
25Z-RB	Tree	yellow birch	*Betula alleghaniensis*	FAC	tree	native	11.5			
25Z-RB	Shrub	white ash	*Fraxinus americana*	FACU	tree	native		3		
25Z-RB	Shrub	sugar maple	*Acer saccharum*	FACU	tree	native		58		
25Z-RB	Shrub	serviceberry	*Amelanchier interior*	UPL	shrub	native		1		
25Z-RB	Herbaceous	sedge	*Carex peckii*	UPL	sedge	native			20	
25Z-RB	Herbaceous	sugar maple	*Acer saccharum*	FACU	tree	native			30	
26-RB	Tree	ironwood	*Ostrya virginiana*	FACU	tree	native	4			
26-RB	Tree	yellow birch	*Betula alleghaniensis*	FAC	tree	native	19.5			
26-RB	Shrub	speckled alder	*Alnus incana*	FACW	shrub	native		178		
26-RB	Herbaceous	tall goldenrod	*solidago altissima*	FACU	forb	native			2	
26-RB	Herbaceous	reed canary grass	*Phalaris arundinacea*	FACW	grass	native			90	
26-RB	Herbaceous	jewelweed	*Impatiens capensis*	FACW	forb	native			2	
2A-RB	Tree	white ash	*Fraxinus americana*	FACU	tree	native	3.4			
2A-RB	Tree	quaking aspen	*Populus tremuloides*	FAC	tree	native	3.2			
2A-RB	Tree	quaking aspen	*Populus tremuloides*	FAC	tree	native	3.1			
2A-RB	Tree	quaking aspen	*Populus tremuloides*	FAC	tree	native	4.4			
2A-RB	Tree	quaking aspen	*Populus tremuloides*	FAC	tree	native	3.8			
2A-RB	Tree	quaking aspen	*Populus tremuloides*	FAC	tree	native	3.9			
2A-RB	Tree	quaking aspen	*Populus tremuloides*	FAC	tree	native	3.5			
2A-RB	Tree	quaking aspen	*Populus tremuloides*	FAC	tree	native	5.5			
2A-RB	Tree	quaking aspen	*Populus tremuloides*	FAC	tree	native	3.4			
2A-RB	Tree	balsam fir	*Abies balsamea*	FAC	tree	native	3.2			
2A-RB	Shrub	quaking aspen	*Populus tremuloides*	FAC	tree	native		41		
2A-RB	Shrub	bigtooth aspen	*Populus grandidentata*	FACU	tree	native		1		
2A-RB	Shrub	beaked hazel	*Corylus cornuta*	FACU	shrub	native		1		
2A-RB	Shrub	willow	*Salix eriocephala*	FACW	shrub	native		18		
2A-LB	Herbaceous	sarsaparilla	*Aralia nudicaulis*	FACU	forb	native			20	
2A-LB	Herbaceous	wild strawberry	*Fragaria virginiana*	FACU	forb	native			10	

Plot ID	Strata	Common Name	*Scientific Name*	Indicator Status	Physiognomic Classification	Native/Non-Native	DBH (inches)	Stem Count	% Cover	Multistem
2A-LB	Herbaceous	bracken fern	*Pteridium aquilinum*	FACU	fern	native			10	
2A-LB	Herbaceous	bunchberry	*Cornus canadensis*	FAC	shrub	native			5	
2A-LB	Herbaceous	birdfoot trefoil	*Lotus corniculatus*	FACU	forb	non-native			5	
2B-RB	Shrub	willow	*Salix eriocephala*	FACW	shrub	native		118	*	
2B-RB	Shrub	quaking aspen	*Populus tremuloides*	FAC	tree	native		1		
2B-RB	Shrub	balsam fir	*Abies balsamea*	FAC	tree	native		1		
2B-RB	Shrub	yellow birch	*Betula alleghaniensis*	FAC	tree	native		1		
2B-LB	Herbaceous	woodland horsetail	*Equisetum sylvaticum*	FACW	fern	native			30	
2B-LB	Herbaceous	wild strawberry	*Fragaria virginiana*	FACU	forb	native			10	
2C-RB	Tree	quaking aspen	*Populus tremuloides*	FAC	tree	native	4.8			
2C-RB	Tree	quaking aspen	*Populus tremuloides*	FAC	tree	native	4.2			
2C-RB	Tree	quaking aspen	*Populus tremuloides*	FAC	tree	native	5.4			
2C-RB	Tree	quaking aspen	*Populus tremuloides*	FAC	tree	native	3.8			
2C-RB	Tree	quaking aspen	*Populus tremuloides*	FAC	tree	native	3.4			
2C-RB	Tree	quaking aspen	*Populus tremuloides*	FAC	tree	native	3.4			
2C-RB	Tree	quaking aspen	*Populus tremuloides*	FAC	tree	native	3.3			
2C-RB	Tree	quaking aspen	*Populus tremuloides*	FAC	tree	native	7.8			
2C-RB	Tree	quaking aspen	*Populus tremuloides*	FAC	tree	native	6.8			
2C-RB	Tree	quaking aspen	*Populus tremuloides*	FAC	tree	native	5.6			
2C-RB	Tree	quaking aspen	*Populus tremuloides*	FAC	tree	native	4.2			
2C-RB	Tree	quaking aspen	*Populus tremuloides*	FAC	tree	native	5.6			
2C-RB	Tree	quaking aspen	*Populus tremuloides*	FAC	tree	native	3.5			
2C-RB	Tree	quaking aspen	*Populus tremuloides*	FAC	tree	native	5.4			
2C-RB	Tree	quaking aspen	*Populus tremuloides*	FAC	tree	native	3.8			
2C-RB	Tree	quaking aspen	*Populus tremuloides*	FAC	tree	native	5.1			
2C-RB	Tree	quaking aspen	*Populus tremuloides*	FAC	tree	native	3.1			
2C-RB	Tree	quaking aspen	*Populus tremuloides*	FAC	tree	native	3.4			
2C-RB	Tree	quaking aspen	*Populus tremuloides*	FAC	tree	native	3.5			
2C-RB	Tree	quaking aspen	*Populus tremuloides*	FAC	tree	native	3.3			
2C-RB	Tree	sugar maple	*Acer saccharum*	FACU	tree	native	3			
2C-RB	Tree	balsam fir	*Abies balsamea*	FAC	tree	native	4.4			
2C-RB	Tree	white spruce	*Picea glauca*	FACU	tree	native	4.8			

Plot ID	Strata	Common Name	*Scientific Name*	Indicator Status	Physiognomic Classification	Native/Non-Native	DBH (inches)	Stem Count	% Cover	Multistem
2C-RB	Shrub	quaking aspen	*Populus tremuloides*	FAC	tree	native		8		
2C-LB	Herbaceous	alfalfa	*Medicago sativa*	UPL	forb	non-native			10	
2C-LB	Herbaceous	Canada goldenrod	*Solidago canadensis*	FACU	forb	native			10	
2C-LB	Herbaceous	woodland horsetail	*Equisetum sylvaticum*	FACW	fern	native			20	
2C-LB	Herbaceous	golden ragwort	*Packera aurea*	FACW	forb	native			10	
2D-LB	Tree	balsam fir	*Abies balsamea*	FAC	tree	native	3.4			
2D-LB	Tree	white birch	*Betula papyrifera*	FACU	tree	native	4.4			
2D-LB	Tree	white birch	*Betula papyrifera*	FACU	tree	native	6.2			
2D-LB	Shrub	black spruce	*Picea mariana*	FACW	tree	native		2		
2D-LB	Shrub	quaking aspen	*Populus tremuloides*	FAC	tree	native		8		
2D-LB	Shrub	white birch	*Betula papyrifera*	FACU	tree	native		1		
2D-LB	Shrub	prairie willow	*Salix humilis*	FACU	shrub	native		26		
2D-LB	Shrub	willow	*Salix eriocephala*	FACW	shrub	native		62		
2D-LB	Herbaceous	woodland horsetail	*Equisetum sylvaticum*	FACW	fern	native			60	
2D-LB	Herbaceous	queen Anne's lace	*Daucus carota*	UPL	forb	non-native			10	
2D-RB	Tree	white ash	*Fraxinus americana*	FACU	tree	native	4.4			
2D-RB	Tree	quaking aspen	*Populus tremuloides*	FAC	tree	native	7			
2D-RB	Tree	quaking aspen	*Populus tremuloides*	FAC	tree	native	8.7			
2D-RB	Shrub	quaking aspen	*Populus tremuloides*	FAC	tree	native		21		
2D-RB	Herbaceous	thimbleberry	*Rubus parviflorus*	FACU	shrub	native			10	
2D-RB	Herbaceous	Canada goldenrod	*Solidago canadensis*	FACU	forb	native			90	
3A-RB	Tree	white ash	*Fraxinus americana*	FACU	tree	native	5.5			
3A-RB	Tree	white ash	*Fraxinus americana*	FACU	tree	native	3.1			
3A-RB	Tree	balsam fir	*Abies balsamea*	FAC	tree	native	3.5			
3A-RB	Tree	balsam fir	*Abies balsamea*	FAC	tree	native	3			
3A-RB	Tree	quaking aspen	*Populus tremuloides*	FAC	tree	native	6.8			
3A-RB	Tree	quaking aspen	*Populus tremuloides*	FAC	tree	native	3.8			
3A-RB	Tree	red maple	*Acer rubrum*	FAC	tree	native	7.5			
3A-RB	Shrub	white ash	*Fraxinus americana*	FACU	tree	native		12		
3A-RB	Shrub	quaking aspen	*Populus tremuloides*	FAC	tree	native		29		
3A-RB	Shrub	red maple	*Acer rubrum*	FAC	tree	native		19		
3A-RB	Shrub	balsam fir	*Abies balsamea*	FAC	tree	native		35		
3A-RB	Herbaceous	bracken fern	*Pteridium aquilinum*	FACU	fern	native			80	
3A-RB	Herbaceous	largeleaf aster	*Eurybia macrophylla*	UPL	forb	native			10	
3A-RB	Herbaceous	sarsaparilla	*Aralia nudicaulis*	FACU	Forb	native			10	
3B-RB	Tree	white ash	*Fraxinus americana*	FACU	tree	native	4.4			
3B-RB	Tree	red maple	*Acer rubrum*	FAC	tree	native	6			

Plot ID	Strata	Common Name	*Scientific Name*	Indicator Status	Physiognomic Classification	Native/Non-Native	DBH (inches)	Stem Count	% Cover	Multistem
3B-RB	Tree	red maple	*Acer rubrum*	FAC	tree	native	6.5			
3B-RB	Tree	balsam fir	*Abies balsamea*	FAC	tree	native	4.4			
3B-RB	Tree	balsam fir	*Abies balsamea*	FAC	tree	native	3.8			
3B-RB	Tree	balsam fir	*Abies balsamea*	FAC	tree	native	4.4			
3B-RB	Tree	balsam fir	*Abies balsamea*	FAC	tree	native	3.4			
3B-RB	Tree	balsam fir	*Abies balsamea*	FAC	tree	native	5.6			
3B-RB	Tree	balsam fir	*Abies balsamea*	FAC	tree	native	4.4			
3B-RB	Tree	sugar maple	*Acer saccharum*	FACU	tree	native	4.6			
3B-RB	Tree	sugar maple	*Acer saccharum*	FACU	tree	native	4.1			
3B-RB	Tree	sugar maple	*Acer saccharum*	FACU	tree	native	4			
3B-RB	Tree	yellow birch	*Betula alleghaniensis*	FAC	tree	native	7			
3B-RB	Shrub	balsam fir	*Abies balsamea*	FAC	tree	native		39		
3B-RB	Shrub	quaking aspen	*Populus tremuloides*	FAC	tree	native		18		
3B-RB	Shrub	bebbs willow	*Salix bebbiana*	FACW	shrub	native		32		
3B-RB	Shrub	Willow	*Salix eriocephala*	FACW	shrub	native		8		
3B-RB	Herbaceous	quaking aspen	*Populus tremuloides*	FAC	tree	native			10	
3B-RB	Herbaceous	sugar maple	*Acer saccharum*	FACU	tree	native			10	
3B-RB	Herbaceous	bracken fern	*Pteridium aquilinum*	FACU	fern	native			30	
3B-RB	Herbaceous	largeleaf aster	*Eurybia macrophylla*	UPL	forb	native			10	
4A-RB	Tree	yellow birch	*Betula alleghaniensis*	FAC	tree	native	11			
4A-RB	Tree	yellow birch	*Betula alleghaniensis*	FAC	tree	native	6.2			
4A-RB	Tree	sugar maple	*Acer saccharum*	FACU	tree	native	5.1			
4A-RB	Tree	sugar maple	*Acer saccharum*	FACU	tree	native	3.7			
4A-RB	Tree	sugar maple	*Acer saccharum*	FACU	tree	native	5.5			
4A-RB	Tree	balsam fir	*Abies balsamea*	FAC	tree	native	3.6			
4A-RB	Tree	balsam fir	*Abies balsamea*	FAC	tree	native	4.4			
4A-RB	Tree	balsam fir	*Abies balsamea*	FAC	tree	native	5.2			
4A-RB	Tree	balsam fir	*Abies balsamea*	FAC	tree	native	3.2			
4A-RB	Tree	yellow birch	*Betula alleghaniensis*	FAC	tree	native	6.6			
4A-RB	Tree	yellow birch	*Betula alleghaniensis*	FAC	tree	native	5.8			
4A-RB	Tree	yellow birch	*Betula alleghaniensis*	FAC	tree	native	8.4			
4A-RB	Shrub	white ash	*Fraxinus americana*	FACU	tree	native		12		
4A-RB	Shrub	balsam fir	*Abies balsamea*	FAC	tree	native		42		
4A-RB	Shrub	sugar maple	*Acer saccharum*	FACU	tree	native		25		
4A-RB	Herbaceous	balsam fir	*Abies balsamea*	FAC	tree	native			10	
4A-RB	Herbaceous	sugar maple	*Acer saccharum*	FACU	tree	native			10	
4A-RB	Herbaceous	sarsaparilla	*Aralia nudicaulis*	FACU	Forb	native			50	
4A-RB	Herbaceous	Canada goldenrod	*Solidago canadensis*	FACU	forb	native			10	
4A-RB	Herbaceous	thimbleberry	*Rubus parviflorus*	FACU	shrub	native			10	
4A-RB	Herbaceous	Canadian fly honeysuckle	*Lonicera canadensis*	FACU	shrub	native			10	
9-LB	Tree	sugar maple	*Acer saccharum*	FACU	tree	native	10.5			
9-LB	Tree	sugar maple	*Acer saccharum*	FACU	tree	native	4.2			
9-LB	Tree	sugar maple	*Acer saccharum*	FACU	tree	native	8			
9-LB	Tree	sugar maple	*Acer saccharum*	FACU	tree	native	7.5			

Plot ID	Strata	Common Name	*Scientific Name*	Indicator Status	Physiognomic Classification	Native/Non-Native	DBH (inches)	Stem Count	% Cover	Multistem
9-LB	Tree	sugar maple	*Acer saccharum*	FACU	tree	native	6.2			
9-LB	Tree	sugar maple	*Acer saccharum*	FACU	tree	native	6.9			
9-LB	Tree	sugar maple	*Acer saccharum*	FACU	tree	native	5.4			
9-LB	Tree	sugar maple	*Acer saccharum*	FACU	tree	native	4.6			
9-LB	Tree	sugar maple	*Acer saccharum*	FACU	tree	native	8			
9-LB	Tree	sugar maple	*Acer saccharum*	FACU	tree	native	6			
9-LB	Tree	sugar maple	*Acer saccharum*	FACU	tree	native	7.2			
9-LB	Tree	sugar maple	*Acer saccharum*	FACU	tree	native	5.5			
9-LB	Tree	sugar maple	*Acer saccharum*	FACU	tree	native	4			
9-LB	Tree	sugar maple	*Acer saccharum*	FACU	tree	native	6			
9-LB	Tree	yellow birch	*Betula alleghaniensis*	FAC	tree	native	7.2			
9-LB	Tree	yellow birch	*Betula alleghaniensis*	FAC	tree	native	9.4			
9-LB	Tree	yellow birch	*Betula alleghaniensis*	FAC	tree	native	8			
9-LB	Tree	yellow birch	*Betula alleghaniensis*	FAC	tree	native	4.4			
9-LB	Tree	yellow birch	*Betula alleghaniensis*	FAC	tree	native	5.3			
9-LB	Tree	hemlock	*Tsuga canadensis*	FACU	tree	native	5.1			
9-LB	Tree	hemlock	*Tsuga canadensis*	FACU	tree	native	8.5			
9-LB	Tree	hemlock	*Tsuga canadensis*	FACU	tree	native	5			
9-LB	Tree	hemlock	*Tsuga canadensis*	FACU	tree	native	3.7			
9-LB	Tree	hemlock	*Tsuga canadensis*	FACU	tree	native	4.2			
9-LB	Tree	hemlock	*Tsuga canadensis*	FACU	tree	native	7.5			
9-LB	Tree	hemlock	*Tsuga canadensis*	FACU	tree	native	3.5			
9-LB	Tree	hemlock	*Tsuga canadensis*	FACU	tree	native	3			
9-LB	Tree	balsam fir	*Abies balsamea*	FAC	tree	native	4.2			
9-LB	Tree	balsam fir	*Abies balsamea*	FAC	tree	native	3.8			
9-LB	Tree	balsam fir	*Abies balsamea*	FAC	tree	native	6			
9-LB	Tree	balsam fir	*Abies balsamea*	FAC	tree	native	4			
9-LB	Tree	balsam fir	*Abies balsamea*	FAC	tree	native	3.8			
9-LB	Tree	balsam fir	*Abies balsamea*	FAC	tree	native	3.4			
9-LB	Tree	balsam fir	*Abies balsamea*	FAC	tree	native	3.8			
9-LB	Tree	balsam fir	*Abies balsamea*	FAC	tree	native	4			
9-LB	Tree	balsam fir	*Abies balsamea*	FAC	tree	native	4.8			
9-LB	Tree	yellow birch	*Betula alleghaniensis*	FAC	tree	native	4			
9-LB	Tree	yellow birch	*Betula alleghaniensis*	FAC	tree	native	7.6			
9-LB	Tree	yellow birch	*Betula alleghaniensis*	FAC	tree	native	11			
9-LB	Shrub	balsam fir	*Abies balsamea*	FAC	tree	native		16		
9-LB	Shrub	sugar maple	*Acer saccharum*	FACU	tree	native		1		
9-LB	Shrub	hemlock	*Tsuga canadensis*	FACU	tree	native		1		
9-LB	Herbaceous	Canada goldenrod	*Solidago canadensis*	FACU	forb	native			5	
9-RB	Tree	white ash	*Fraxinus americana*	FACU	tree	native	5.4			
9-RB	Tree	white ash	*Fraxinus americana*	FACU	tree	native	3.5			
9-RB	Tree	yellow birch	*Betula alleghaniensis*	FAC	tree	native	3.8			
9-RB	Tree	yellow birch	*Betula alleghaniensis*	FAC	tree	native	7.5			

Plot ID	Strata	Common Name	*Scientific Name*	Indicator Status	Physiognomic Classification	Native/Non-Native	DBH (inches)	Stem Count	% Cover	Multistem
9-RB	Tree	yellow birch	*Betula alleghaniensis*	FAC	tree	native	13			
9-RB	Tree	yellow birch	*Betula alleghaniensis*	FAC	tree	native	9.8			
9-RB	Tree	yellow birch	*Betula alleghaniensis*	FAC	tree	native	10.8			
9-RB	Tree	yellow birch	*Betula alleghaniensis*	FAC	tree	native	7.2			
9-RB	Tree	yellow birch	*Betula alleghaniensis*	FAC	tree	native	3.6			
9-RB	Tree	yellow birch	*Betula alleghaniensis*	FAC	tree	native	11.8			
9-RB	Tree	boxelder	*Acer negundo*	FAC	tree	native	3.9			
9-RB	Tree	boxelder	*Acer negundo*	FAC	tree	native	4.8			
9-RB	Tree	sugar maple	*Acer saccharum*	FACU	tree	native	9.9			
9-RB	Tree	sugar maple	*Acer saccharum*	FACU	tree	native	23.5			
9-RB	Tree	sugar maple	*Acer saccharum*	FACU	tree	native	10.5			
9-RB	Tree	sugar maple	*Acer saccharum*	FACU	tree	native	7.5			
9-RB	Tree	sugar maple	*Acer saccharum*	FACU	tree	native	13.7			
9-RB	Tree	sugar maple	*Acer saccharum*	FACU	tree	native	7.6			
9-RB	Tree	sugar maple	*Acer saccharum*	FACU	tree	native	7.5			
9-RB	Tree	sugar maple	*Acer saccharum*	FACU	tree	native	10.4			
9-RB	Tree	sugar maple	*Acer saccharum*	FACU	tree	native	13			
9-RB	Tree	sugar maple	*Acer saccharum*	FACU	tree	native	4.3			
9-RB	Tree	sugar maple	*Acer saccharum*	FACU	tree	native	14.8			
9-RB	Tree	hemlock	*Tsuga canadensis*	FACU	tree	native	22.5			
9-RB	Tree	hemlock	*Tsuga canadensis*	FACU	tree	native	26			
9-RB	Tree	hemlock	*Tsuga canadensis*	FACU	tree	native	6.2			
9-RB	Tree	hemlock	*Tsuga canadensis*	FACU	tree	native	22			
9-RB	Tree	hemlock	*Tsuga canadensis*	FACU	tree	native	20			
9-RB	Shrub	sugar maple	*Acer saccharum*	FACU	tree	native		14		
9-RB	Shrub	balsam fir	*Abies balsamea*	FAC	tree	native		3		
9-RB	Herbaceous	evergreen woodfern	*Dryopteris intermedia*	FAC	fern	native			20	
9-RB	Herbaceous	sugar maple	*Acer saccharum*	FACU	tree	native			10	
9-RB	Herbaceous	indian pipe	*Monotropa uniflora*	FACU	forb	native			5	
9-RB	Herbaceous	sedge	*Carex peckii*	UPL	sedge	native			5	
9-RB	Herbaceous	Canada goldenrod	*Solidago canadensis*	FACU	forb	native			10	

Attachment B

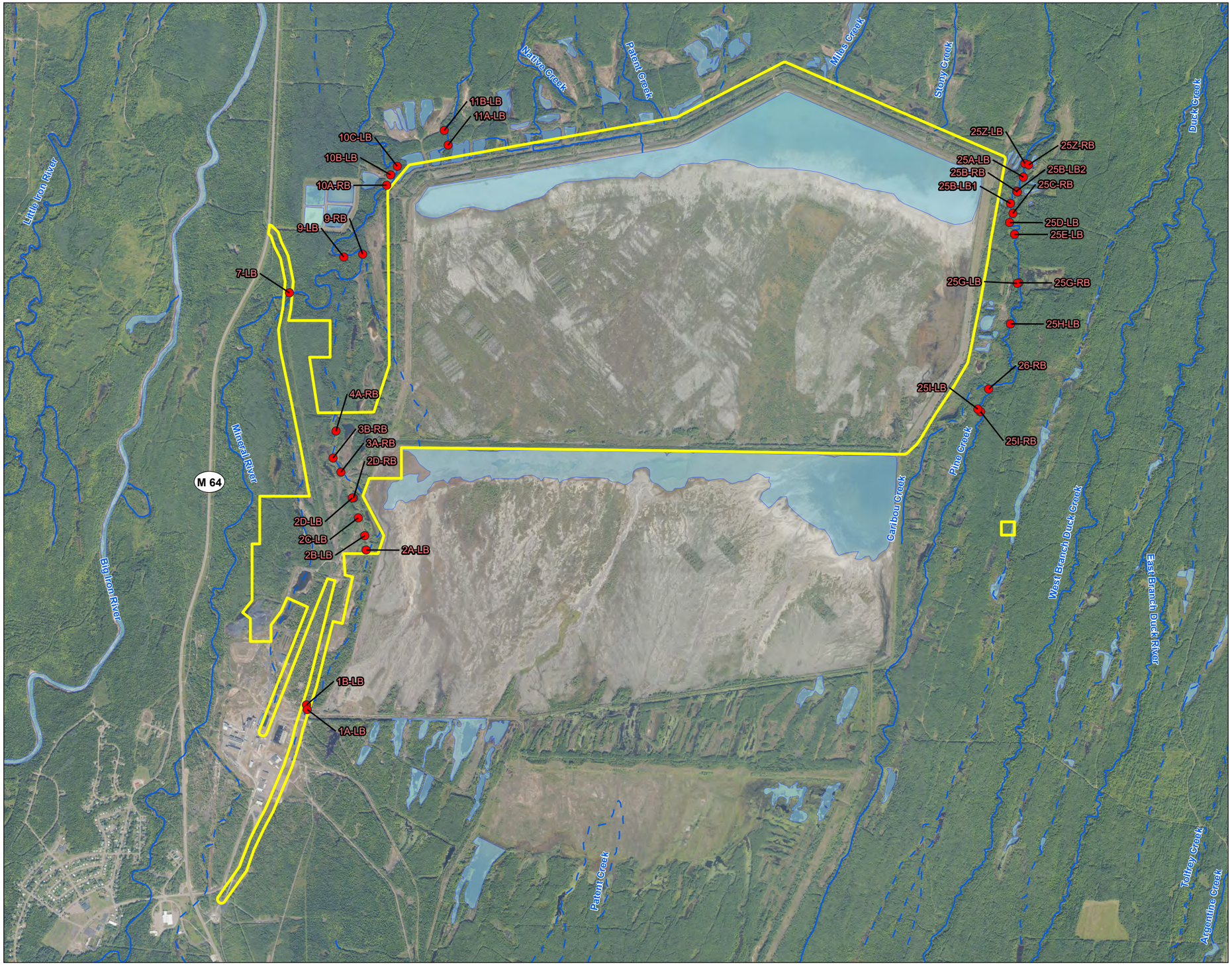


Figure No.
1

Title
Riparian Plot Locations

Client/Project 193710518
White Pine Copper LLC
White Pine Copper Project

Project Location
Twp. of Carp Lake,
Ontonagon Co., MI

Prepared by JM on 2024-09-10
TR by AV on 2024-09-10
IR by ME on 2024-09-11

N

0 1,250 2,500 Feet
(At original document size of 11x17)
1:30,000

Legend
- Proposed Project Extent
- Riparian Plot Center

National Hydrography Dataset
- Perennial Stream
- Intermittent Stream
- Waterbody



Notes
1. Coordinate System: NAD 1983 UTM Zone 16N
2. Data Sources: Stantec, Esri, White Pine Copper LLC, USCB, USGS
3. Background: 2022 NAIP

Stantec

U:\193710518\03_data\gis_cad\gis\ArcPro\193710518_WhitePineCopper\193710518_WhitePineCopper.aprx Revised: 2024-09-11 By: jmarty

Disclaimer: This document has been prepared based on information provided by others as cited in the Notes section. Stantec has not verified the accuracy and/or completeness of this information and shall not be responsible for any errors or omissions which may be incorporated herein as a result. Stantec assumes no responsibility for data supplied in electronic format, and the recipient accepts full responsibility for verifying the accuracy and completeness of the data.

Attachment C

Riparian Plots Photolog

Stantec

Photographic Log

Client:	**White Pine Copper**	**Project:**	**SQT Riparian Plots**
Site Name:	**White Pine**	**Site Location:**	**Ontonagon County, Michigan**

Photograph ID: 1

Photo Location:
Plot 25I RB

Direction:

Survey Date:
8/5/2024

Comments:



Photograph ID: 2

Photo Location:
Plot 25I LB

Direction:

Survey Date:
8/5/2024

Comments:



Client:	**White Pine Copper**	**Project:**	**SQT Riparian Plots**
Site Name:	**White Pine**	**Site Location:**	**Ontonagon County, Michigan**

Photograph ID: 3

Photo Location:
Plot 26 RB

Direction:

Survey Date:
8/5/2024

Comments:



Photograph ID: 4

Photo Location:
Plot 25H LB

Direction:

Survey Date:
8/5/2024

Comments:



Client:	**White Pine Copper**	**Project:**	**SQT Riparian Plots**
Site Name:	**White Pine**	**Site Location:**	**Ontonagon County, Michigan**

Photograph ID: 5 **Photo Location:** Plot 25G RB **Direction:** **Survey Date:** 8/5/2024 **Comments:**	
Photograph ID: 6 **Photo Location:** Plot 25G LB **Direction:** **Survey Date:** 8/5/2024 **Comments:**	

Client:	**White Pine Copper**	**Project:**	**SQT Riparian Plots**
Site Name:	**White Pine**	**Site Location:**	**Ontonagon County, Michigan**

Photograph ID: 7

Photo Location:
Plot 25E LB

Direction:

Survey Date:
8/5/2024

Comments:



Photograph ID: 8

Photo Location:
Plot 25D LB

Direction:

Survey Date:
8/5/2024

Comments:



Client:	**White Pine Copper**	**Project:**	**SQT Riparian Plots**
Site Name:	**White Pine**	**Site Location:**	**Ontonagon County, Michigan**

Photograph ID: 9 **Photo Location:** Plot 25C RB **Direction:** **Survey Date:** 8/5/2024 **Comments:**	
Photograph ID: 10 **Photo Location:** Plot 25B LB **Direction:** **Survey Date:** 8/5/2024 **Comments:**	

Client:	**White Pine Copper**	**Project:**	**SQT Riparian Plots**
Site Name:	**White Pine**	**Site Location:**	**Ontonagon County, Michigan**

Photograph ID: 11 **Photo Location:** Plot 25B LB2 **Direction:** **Survey Date:** 8/5/2024 **Comments:**	
Photograph ID: 12 **Photo Location:** Plot 25Z LB **Direction:** **Survey Date:** 8/5/2024 **Comments:**	

Client:	**White Pine Copper**	**Project:**	**SQT Riparian Plots**
Site Name:	**White Pine**	**Site Location:**	**Ontonagon County, Michigan**

Photograph ID: 13

Photo Location:
Plot 25Z RB

Direction:

Survey Date:
8/5/2024

Comments:



Photograph ID: 14

Photo Location:
Plot 25A LB

Direction:

Survey Date:
8/5/2024

Comments:



Client:	**White Pine Copper**	**Project:**	**SQT Riparian Plots**
Site Name:	**White Pine**	**Site Location:**	**Ontonagon County, Michigan**

Photograph ID: 15

Photo Location:
Plot 11B LB

Direction:

Survey Date:
8/5/2024

Comments:



Photograph ID: 16

Photo Location:
Plot 11A LB

Direction:

Survey Date:
8/5/2024

Comments:



Client:	**White Pine Copper**	**Project:**	**SQT Riparian Plots**
Site Name:	**White Pine**	**Site Location:**	**Ontonagon County, Michigan**

Photograph ID: 17

Photo Location:
Plot 10A RB

Direction:

Survey Date:
8/6/2024

Comments:



Photograph ID: 18

Photo Location:
Plot 10C LB

Direction:

Survey Date:
8/5/2024

Comments:



Client:	**White Pine Copper**	**Project:**	**SQT Riparian Plots**
Site Name:	**White Pine**	**Site Location:**	**Ontonagon County, Michigan**

Photograph ID: 19 **Photo Location:** Plot 10B LB **Direction:** **Survey Date:** 8/5/2024 **Comments:**	
Photograph ID: 20 **Photo Location:** Plot 7 LB **Direction:** **Survey Date:** 8/6/2024 **Comments:**	

Client:	**White Pine Copper**	**Project:**	**SQT Riparian Plots**
Site Name:	**White Pine**	**Site Location:**	**Ontonagon County, Michigan**

Photograph ID: 21

Photo Location:
Plot 9 RB

Direction:

Survey Date:
8/6/2024

Comments:



Photograph ID: 22

Photo Location:
Plot 9 LB

Direction:

Survey Date:
8/6/2024

Comments:



Client:	**White Pine Copper**	**Project:**	**SQT Riparian Plots**
Site Name:	**White Pine**	**Site Location:**	**Ontonagon County, Michigan**

Photograph ID: 23

Photo Location:
Plot 4A RB

Direction:

Survey Date:
8/6/2024

Comments:



Photograph ID: 24

Photo Location:
Plot 3B RB

Direction:

Survey Date:
8/6/2024

Comments:



Client:	**White Pine Copper**	**Project:**	**SQT Riparian Plots**
Site Name:	**White Pine**	**Site Location:**	**Ontonagon County, Michigan**

Photograph ID: 25

Photo Location:
Plot 3A RB

Direction:

Survey Date:
8/6/2024

Comments:



Photograph ID: 26

Photo Location:
Plot 2D RB

Direction:

Survey Date:
8/6/2024

Comments:



Client:	**White Pine Copper**	**Project:**	**SQT Riparian Plots**
Site Name:	**White Pine**	**Site Location:**	**Ontonagon County, Michigan**

Photograph ID: 27

Photo Location:
Plot 2D LB

Direction:

Survey Date:
8/6/2024

Comments:



Photograph ID: 28

Photo Location:
Plot 2C LB

Direction:

Survey Date:
8/6/2024

Comments:



Client:	**White Pine Copper**	**Project:**	**SQT Riparian Plots**
Site Name:	**White Pine**	**Site Location:**	**Ontonagon County, Michigan**

Photograph ID: 29 **Photo Location:** Plot 2B LB **Direction:** **Survey Date:** 8/6/2024 **Comments:**	
Photograph ID: 30 **Photo Location:** Plot 2A LB **Direction:** **Survey Date:** 8/6/2024 **Comments:**	

Client:	**White Pine Copper**	**Project:**	**SQT Riparian Plots**
Site Name:	**White Pine**	**Site Location:**	**Ontonagon County, Michigan**

Photograph ID: 31

Photo Location:
Plot 1A LB

Direction:

Survey Date:
8/6/2024

Comments:



Photograph ID: 32

Photo Location:
Plot 1B LB

Direction:

Survey Date:
8/6/2024

Comments:



Biology Data from Advanced Ecological Management

Memo

AEM | ADVANCED ECOLOGICAL MANAGEMENT

To: Matt Stone-Palmquist
From: Doug Workman
cc:
Date: December 12, 2024
Re: Stream survey data in support of SQT

This memorandum has been prepared to describe the biological conditions of five streams located in the vicinity of the White Pine Copper mine property (Figure 1). The information in this memorandum was collected as part of ongoing baseline environmental surveys that have been conducted to support permit activities related to the development of a new mine portal and associated processing infrastructure. Information from these baseline surveys was also used to support a portion of the data collection efforts of Barr Engineering to evaluate these streams in accordance with the Michigan Stream Quantification Tool.

Caribou Creek, the Mineral River, Perch Creek, Pine Creek, and Portal Creek were sampled according to the Michigan Department of Environment, Great Lakes, and Energy (EGLE; formerly the Michigan Department of Environmental Quality) Surface Water Quality Division *Procedure #51 Survey Protocols for Wadable Rivers* (P-51; MDEQ, 1990). The P-51 is a rapid bioassessment protocol that is used to evaluate stream quality based on fish, macroinvertebrates, and stream habitat characteristics.

A backpack electroshocker was used to sample fish in each stream. A multi-pass removal was conducted in each stream sample station except for Portal Creek, where a single pass removal was conducted (Van Deventer and Platts, 1983). For each electrofishing pass, stunned fish were placed in a live well for identification and enumeration. Following collection, identification, and enumeration in each station, fish were released within each station.

Stream fish data were analyzed according to P-51 metrics to produce a "fish score" that was used to rate the fish community as poor, neutral (acceptable), or excellent quality. There are ten metrics used to evaluate the fish community diversity, and they are listed in the P-51 methodology (MDEQ, 1990). The score for each metric can range from –1 to +1 and are described as follows:

- -1 indicates the community is performing outside of (minus) two standard deviations from the average conditions found at excellent sites;
- 0 indicates the community is performing between the average condition and (minus) two standard deviations from the average condition found at excellent sites, and;
- +1 indicates the community is performing better than the average condition found at excellent sites.

The summation of the fish scores can range from –10 to +10 using these metrics. Stations that score from +5 to +10 are considered excellent. Stations that score from –5 to –10 or have less than 50 fish are considered poor, while stations that score from –5 to +5 (including zero) are considered acceptable in fish community structure (MDEQ, 1990).

Macroinvertebrate sampling was conducted within all stream transects. Subsequent to the completion of fish sampling, aquatic macroinvertebrates, including decapods (crayfish), were collected within each station using D-framed kick-nets (Merritt et al., 1996). Samples were collected from all habitat types within each station to characterize the macroinvertebrate community. Stations were sampled for 20 minutes using two kick-nets and samples were collected in all habitat types within each station to characterize the macroinvertebrate community.

The wadable stream macroinvertebrate data were analyzed according to nine metrics identified in the P-51 methodology. The sum of the macroinvertebrate scores can range from –9 to +9; and like the fish community, are graded as excellent, acceptable (slightly impaired), or poor according to the summation of the metric scores.

Mussel species were evaluated for each stream through “Reconnaissance” surveys (Hanshue et al. 2021). Reconnaissance surveys involved walking the streams and looking for mussels within the substrate using a bucket that contained a viewing window at the bottom. Additionally, banks were checked for shells of mussels that had been removed from the water. Live mussels were immediately identified and returned to their original position in the stream, posterior end up, half buried in sediment.

Riparian and instream habitats were qualitatively described for each transect. A description of stream morphology included run/riffle/pool/shallow pool configurations, substrate, substrate embeddedness, instream cover, vegetation, flow stability, and bank stability. Stream habitat was rated as excellent, good, marginal, or poor based on P-51 scores interpreted from 10 habitat metrics. Habitat was rated according to the following P-51 habitat scores (MDEQ, 1990):

Habitat Characterization	**Total Point Score**
1. Excellent	> 154
2. Good	105 – 154
3. Marginal	56 – 104
4. Poor	< 56

Caribou Creek

The Caribou Creek sample station was 100 feet in length and was located approximately 1.94 Miles east of the intersection of LP Walsh Road and M-64 (Figure 1; Table 1). Caribou Creek is a small stream (approximately one-foot wide), with a braided channel just north of the sample station. The substrate was composed of muck and organic matter. Riparian vegetation present during the survey included sedge species (*Carex spp.*), ostrich fern, and royal fern (Photographs 1 and 2). Speckled alder (*Alnus rugosa*) was also present along the banks.

A total of eight fish representing two taxa were collected from Caribou Creek. The two species included the brook stickleback (*Culaea inconstans*) and the central mudminnow (*Umbra limi;* Table 2). No threatened or endangered species were captured in Caribou Creek. The fish community of the Caribou Creek sample station was classified as "Poor" because less than 50 fish total were captured (Table 3).

A total of 117 macroinvertebrates were collected from the Caribou Creek sample station, where Dipterans (flies) and Anisopterans (dragonflies) were the most frequently collected organisms (Table 4). Based on the P-51 rating metrics, the macroinvertebrate community of the Caribou Creek sample station was rated as "Acceptable" (Table 5).

The Caribou Creek sample station was classified as a riffle/run habitat. The habitat was rated as "Good" in accordance with the P-51 total habitat score (Table 6).

The average width of the Caribou Creek sample station was 2.4 feet (standard deviation; *s* = 1.4 feet; sample size; *n* = 3) and the average depth was 0.4 feet (*s* = 0.2 feet; *n* = 9; Table 7). The discharge was not measured within Caribou Creek due to the width of the stream being too small for the equipment to effectively operate. Water temperature within Caribou Creek was 17.0°C, and the pH was 11.6, which was the highest among all sample stations surveyed (Table 8). Conductivity, percent dissolved oxygen, and dissolved oxygen were the lowest in Caribou Creek among all other sampled sample stations (conductivity = 73.0 µS/cm.; % dissolved oxygen = 28.2; dissolved oxygen = 2.7 mg O_2/L; Table 8).

Mineral River

The Mineral River sample station (Min 1) was 300 feet in length and was located approximately 0.15 Miles west of the mine access road along the west side of the mine, where it orients from a north-south road to a northeast oriented road (Table 1). Min 1 was sampled upstream of the culvert that flows under an access drive. Much of the substrate of Min 1 was comprised of bedrock, boulders, and large cobble (Photographs 3 and 4).

A total of 211 fish representing 12 taxa were collected from sample station Min 1. The dominant species included longnose dace (*Rhinichthys cataractae*), creek chub, and mottled sculpin (*Cottus bairdii;* Table 2). No threatened or endangered species were captured in Min 1. The fish community of sample station Min 1 was classified as "Acceptable" with a fish score rating of -1 (Table 3).

A total of 84 macroinvertebrates were collected from Min 1, where true bugs, true flies, and dragonflies were the most frequently collected organisms (Table 4). Based on the P-51 rating metrics, the macroinvertebrate community of sample station Min 1 was rated as "Acceptable" (Table 5).

Min 1 stream habitat was classified as a riffle/run habitat. The habitat was rated as "Good" in accordance with the P-51 protocol total habitat score (Table 6).

The average width of sample station Min 1 was 20.9 feet (standard deviation; *s* = 5.6 feet; sample size; *n* = 3) and the average depth was 0.5 feet (*s* = 0.3 feet; *n* = 9; Table 7). The discharge within Min 1 was 1,341 gallons per minute. Water temperature within Min 1 was 19.2°C, the percent dissolved oxygen was 89.6, and dissolved oxygen was 8.3 mg O_2/L (Table 8). The pH of Min 1 was 8.2 (Table 8).

Perch Creek

One sample station, measuring 300 feet in length, was surveyed on Perch Creek 0.04 Miles northeast of the dam located at the outflow of Pond 2 (Figure 1. Table 1). A series of ponds outlet water over an impoundment along the west side of the downgradient-most pond, which forms the headwaters of Perch Creek. The substrate of Perch Creek included organic matter, woody debris, sand, gravel, and boulders in the upper portion of the sample station and more clay and silt in the lower portion of the sample station (Photographs 5 and 6). Royal fern and speckled alder were present along the banks.

Due to high conductivity and difficulty with adequate net blocking of the sample station due to a high gradient in the sample station, two backpack electroshockers were used to simultaneously survey the sample station using a single pass removal. A total of 47 fish representing 12 taxa were collected from the Perch Creek sample station. The dominant species included creek chub, blacknose dace, and bluntnose minnow (*Pimephales notatus;* Table 2). No threatened or endangered species were captured in the Perch Creek sample station. The fish community of the Perch Creek sample station was classified as "Poor" because less than 50 fish total were captured (Table 3).

A total of 23 macroinvertebrates were collected from Perch Creek, where caddisflies, dragonflies, and true flies were the most frequently collected organisms (Table 4). Based on P-51 rating metrics, the macroinvertebrate community of the Perch Creek sample station was rated as "Acceptable" (Table 5).

Approximately three dozen live cylindrical papershell mussels (*Anodontoides ferussacianus*) were found in the clay substrate located in the downstream extent of the sample station.

The stream habitat of Perch Creek was classified as a riffle/run habitat. The habitat was rated as "Good" in accordance with the P-51 total habitat score (Table 6).

The average width of the Perch Creek sample station was 14.8 feet (standard deviation; *s* = 4.2 feet; sample size; *n* = 3) and the average depth was 0.8 feet (*s* = 0.3 feet; *n* = 9; Table 7). The discharge within Perch Creek was 4462 gallons per minute. Water temperature within the Perch Creek sample station was 24.3°C, which was the highest among all sampled stream transects (Table 8). The Perch Creek sample station also had the highest conductivity at 929.0 µS/cm, the percent dissolved oxygen was 85.9 and the dissolved oxygen was 7.2 mg O_2/L (Table 8).

Pine Creek

The Pine Creek sample station, measuring 300 feet in length, was surveyed approximately 0.10 Miles east of the northeast corner of the mine access road where the road orients to a north-south direction along the east side of the mine (Figure 1, Table 1). Pine Creek was also composed of mostly riffle/run segments and the substrate consisted of boulders and bedrock (Photographs 7 and 8). There were also portions of the sample station that contained undercut banks. Vegetation included speckled alder, ostrich fern, and royal fern.

A total of 102 fish representing 19 taxa were collected from the Pine Creek sample station. The dominant species included creek chub, brown bullhead (*Ameiurus nebulosus*), and mottled sculpin (Table 2). No threatened or endangered species were captured in the Pine Creek sample station. The fish community of the Pine Creek sample station was classified as "Acceptable" with a fish score rating of -1 (Table 3).

A total of 58 macroinvertebrates were collected from Pine Creek, where true flies, mayflies, and true bugs were the most frequently collected organisms (Table 4). Based on P-51 rating metrics, the macroinvertebrate community of the Pine Creek sample station was rated as "Acceptable" (Table 5).

There were several cylindrical papershell mussels found in Pine Creek, but the density was very low throughout the transect.

The stream habitat of Pine Creek was classified as a riffle/run. The habitat was rated as "Good" in accordance with the P-51 total habitat score (Table 6).

The average width of the Pine Creek sample station was 12.8 feet (standard deviation; s = 4.4 feet; sample size; n = 3) and the average depth was 0.6 feet (s = 0.4 feet; n = 9; Table 7). The discharge within Pine Creek was 92 gallons per minute. Water temperature within the Pine Creek sample station was 19.1°C, the percent dissolved oxygen was 80.2, and dissolved oxygen was 7.4 mg O_2/L (Table 8).

Portal Creek

The Portal Creek sample station (PTL-55), measuring 100 feet in length, was surveyed approximately 2,086 feet north of the tailings disposal facility access road that is oriented in a east-west direction near

the old mine portal (Figure 1, Table 1). The riparian area of Portal Creek was generally wide and well vegetated (Photograph 9). The streambed was dominated by clay with sparse gravel and cobble throughout the sample station. The predominance of clay is unsuitable for most macroinvertebrates and the channel incision and steepness of slope typically results in very fast and high-energy flow during high water events.

A total of 13 fish representing three taxa were collected from the Portal Creek sample station. The dominant species was the creek chub (Table 2). No threatened or endangered species were captured in the Portal Creek sample station. The fish community of the Portal Creek sample station was classified as "Poor" because less than 50 fish total were captured (Table 3).

No macroinvertebrates were collected from the PTL-55 Portal Creek sample station (Table 4). Based on P-51 rating metrics, the macroinvertebrate community of the Portal Creek sample station was rated as "Poor" (Table 5).

The stream habitat of the Portal Creek was classified as a riffle/run. The habitat was rated as "Marginal" in accordance with the P-51 total habitat score (Table 6).

The average width of the Portal Creek sample station was 8.0 feet and the average depth was 1.5 feet (Table 7). Water quality data was not collected from Portal Creek at the time of the P-51 survey.

Table 1. Stream sample station location descriptions.

Stream Name	Stream Sample Station	Latitude/Longitude (upstream extent) NAD 1983	Township/Range/ Section	Location Description
Caribou Creek	Caribou	N 46.737269 W -89.522071	T50N/R42W/Sec 11	75 feet north of LP Walsh Rd crossing
Mineral River	Min1	N 46.80111 W -89.55829	T51N/R41W/Sec19	0.15 Miles west of WPC mine access road
Perch Creek	Perch	N 46.804395 W -89.549353	T51N/R41W/Sec 19	0.04 Miles northeast of the dam located at the outflow of Pond 2
Pine Creek	Pine	N 46.803955 W -89.492304	T51N/R41W/Sec 22	0.10 Miles east of the northeast corner of the mine access road
Portal Creek	PTL-55	N 46.770484 W -89.557716	T51N/R41W/Sec 30	Approximately 2,086 feet north of the tailings disposal facility access road

NAD 1983 = North American Datum of 1983
N = North
W = West
T = Township
R = Range
Sec = Section

Table 2. Stream Fish Collection Data – Species and number of fish collected in Caribou Creek, Mineral River, Perch Creek, Pine Creek, and Portal Creek as part of the 2024 White Pine Copper baseline aquatic assessment.

		Sample Station				
Common Name	**Scientific Name**	**Caribou**	**Min 1**	**Perch**	**Pine**	**PTL-55**
Blacknose dace	*Rhinichthys atratulus*		24	5	9	
Blacknose shiner	*Notropis heterolepis*				3	
Blackside darter	*Percina maculata*				1	
Bluegill	*Lepomis macrochirus*			1		
Bluntnose Minnow	*Pimephales notatus*		3	5		
Brook stickleback	*Culaea inconstans*	7	1		1	
Brown bullhead	*Ameiurus nebulosus*				13	
Central mudminnow	*Umbra limi*	1		2	9	
Common shiner	*Luxilis cornutus*		4	2		
Creek chub	*Semolitus atromaculatus*		51	21	24	11
Fathead minnow	*Pimephales promelas*			1		
Hornyhead chub	*Nocomis biguttatus*		1	2		
Iowa darter	*Etheostoma exile*				1	
Johnny darter	*Etheostoma nigrum*			4	7	
Longnose dace	*Rhinichthys cataractae*		57	1	8	1
Mimic shiner	*Notropis volucellus*					
Mottled sculpin	*Cottus bairdii*		27		11	
Northern redbelly dace	*Chrosomus eos*		1		10	1
Pumpkinseed sunfish	*Lepomis gibbosus*		4			
Sand shiner	*Notropis stramineus*			2		
Slimy sculpin	*Cottus cognatus*		24		5	
White sucker	*Catostomus commersonii*		14	1		
	Total	**8**	**211**	**47**	**102**	**13**

Min 1 – Sample station located in Mineral River
PTL-55 – Sample station located in Portal Creek

Table 3. P-51 sample station fish score summaries for Caribou Creek, Mineral River, Perch Creek, Pine Creek and Portal Creek during 2024.

	Sample Station									
	Caribou		Min 1		Perch		Pine		PTL-55	
Metric	**Value**	**Score**	**Value**	**Score**	**Value**	**Score**	**Value**	**Score**	**Value**	**Score**
Total number of taxa	2	0	11	0	12	0	13	1	3	-1
Number of darter, sculpin, madtom taxa	0	-1	1	-1	1	-1	5	1	0	-1
Number of sunfish taxa	0	-1	1	1	1	1	0	-1	0	0
Number of sucker taxa	0	-1	1	-1	1	-1	0	-1	0	-1
Number of intolerant taxa	0	-1	2	-1	1	-1	5	1	1	0
Percent tolerant	12.5	1	43.60	0	82.98	0	48.04	0	84.62	0
Percent omnivorous taxa	12.5	1	43.60	0	74.47	-1	53.92	-1	84.62	0
Percent insectivorous taxa	87.5	1	55.92	1	25.53	-1	36.27	0	7.69	0
Percent piscivorous taxa	0	-1	0	-1	0	-1	0	-1	0	0
Percent simple lithophilic spawner taxa	0	-1	46.92	1	19.15	0	17.65	0	7.69	0
Total Score		**-3**		**-1**		**-5**		**-1**		**-3**
Fish Score		**Poor**		**Acceptable**		**Poor**		**Acceptable**		**Poor**

Min 1 – Sample station located in Mineral River
PTL-55 - Sample station located in Portal Creek

Table 4. Stream sample station macroinvertebrate data from Caribou Creek Mineral River, Perch Creek and Pine Creek from July 2024, and for Portal Creek from June 2024.

	Sample Station				
Taxa	**Caribou**	**Min 1**	**Perch**	**Pine**	**PTL-55**
ANNELIDA (segmented worms)					
Hirudinea (leeches)			1		
Lumbriculida	1				
ARTHROPODA					
Decapoda (crayfish)		4		1	
Insecta					
Ephemeroptera (mayflies)					
Baetidae		6		11	
Heptageniidae				2	
Odonata					
Anisoptera (dragonflies)					
Aeshnidae		2	1	1	
Calopterygidae			4		
Cordulegasteridae	32	4	1	1	
Corduliidae		2			
Plecoptera (stoneflies)					
Perlodidae				1	
Hemiptera (true bugs)					
Gerridae	4	3		10	
Veliidae		47			
Megaloptera					
Corydalidae (dobson flies)			1	2	
Trichoptera (caddisflies)					
Hydropsychidae			8		
Limnephilidae	1	1	1	5	
Philopotamidae			1		
Coleoptera (beetles)					
Dytiscidae (total)	7				
Elmidae		2		2	
Gyrinidae		1			
Hydrophilidae	1				
Diptera (flies)					
Chironomidae	40	7	3	8	
Simuliidae	25	4	2	13	
Tipulidae		1		1	
MOLLUSCA					
Gastropoda (snails)					
Planorbidae	4				
Pelecypoda (bivalves)					
Pisidiidae	2				
Total Collected	**117**	**84**	**23**	**58**	**0**

Min 1 – Sample station located in Mineral River
PTL-55 - Sample station located in Portal Creek

Table 5. P-51 stream macroinvertebrate scores and community ratings from July 2024 for Caribou Creek, Mineral River, Perch Creek and Pine Creek, and from June 2024 for Portal Creek.

	Sample Station									
	Caribou		**Min 1**		**Perch**		**Pine**		**PTL-55**	
Metric	**Value**	**Score**	**Value**	**Score**	**Value**	**Score**	**Value**	**Score**	**Value**	**Score**
Total number of taxa	10	1	13	0	10	-1	13	0	0	n.d.
Number of mayfly taxa	0	-1	1	-1	0	-1	2	-1	0	n.d.
Number of caddisfly taxa	1	-1	1	-1	3	0	1	-1	0	n.d.
Number of stonefly taxa	0	-1	0	-1	0	-1	1	0	0	n.d.
Percent mayfly taxa	0	-1	7.143	0	0	-1	22.41	1	0	n.d.
Percent caddisfly taxa	0.85	-1	1.190	0	43.48	1	8.62	0	0	n.d.
Percent contr. dom. taxon	34.19	-1	55.95	-1	34.78	-1	22.41	0	0	n.d.
Percent isopod, snail, leech	3.419	1	0	1	4.348	0	0	1	0	n.d.
Percent surf. air breathers	10.26	0	60.71	-1	0	1	17.24	-1	0	n.d.
Total Score		-4		-4		-3		-4		n.d.
Community Rating	**Acceptable**		**Acceptable**		**Acceptable**		**Acceptable**		**Poor**	

Min 1 – Sample station located in Mineral River

PTL-55 - Sample station located in Portal Creek

n.d. – not determined. No macroinvertebrates were collected in this sample station.

Table 6. P-51 stream habitat scores and ratings from July 2024 for Caribou Creek, Mineral River, Perch Creek and Pine Creek, and from June 2024 for Portal Creek.

			Sample Station		
Habitat Metric	**Caribou** Riffle/Run	**Min 1** Riffle/Run	**Perch** Riffle/Run	**Pine** Riffle/Run	**PTL-55** Riffle/Run
Epifaunal Substrate/Avail. Cover	13	19	13	13	7
Embeddedness	3	17	15	16	16
Velocity/Depth Regime	3	16	17	17	8
Sediment Deposition	4	18	16	16	16
Maintained Flow Volume	9	8	8	7	3
Flashiness	10	2	1	1	2
Channel Alteration	19	11	13	13	12
Frequency of Riffles (or Bends)	18	18	16	15	7
Bank Stability (L)	10	5	3	4	5
Bank Stability (R)	10	4	3	5	6
Vegetative Protection (L)	10	4	4	4	2
Vegetative Protection (R)	10	4	4	4	2
Riparian Veg. Zone Width (L)	10	5	9	10	7
Riparian Veg. Zone Width (R)	10	4	9	10	10
Total Score	139	132	131	135	103
Habitat Rating	**Good**	**Good**	**Good**	**Good**	**Marginal**

L – left bank facing downstream
R - right bank facing downstream
Min 1 – Sample station located in Mineral River
PTL-55 - Sample station located in Portal Creek

Table 7. Stream sample station dimensions.

Station	Length	Width (ft)		Depth (ft)	
		Average*	*s*	Average *	*s*
Caribou	100	2.4 (3)	1.4	0.4 (9)	0.2
Min 1	300	20.9 (3)	5.6	0.5 (9)	0.3
Perch	300	14.8 (3)	4.2	0.8 (9)	0.3
Pine	300	12.8 (3)	4.4	0.6 (9)	0.4
PTL-55	100	8.0		1.5	

*sample size is indicated within ()

s = standard deviation

ft = feet

Min 1 – Sample station located in Mineral River

PTL-55 - Sample station located in Portal Creek – stream depth and width visually estimated

Table 8. Average water quality parameters – stream sample stations.

Sample Station	Date	Time	Temperature °C	pH	Conductivity µS/cm	Percent Dissolved Oxygen	Dissolved Oxygen mg O_2/L	Discharge gpm
Caribou	7/10/2024	13:57	17.0 (0.1)	11.6 (0.4)	73.0 (2.0)	28.2 (5.3)	2.7 (0.5)	n.m.
Min 1	7/8/2024	14:18	19.2 (0.2)	8.2 (0.04)	160.0 (0.8)	89.6 (0.8)	8.3 (0.1)	1341
Perch	7/8/2024	18:57	24.3 (0.1)	8.2 (0.02)	929.0 (1.2)	85.9 (1.6)	7.2 (0.1)	4462
Pine	7/9/2024	11:04	19.1 (0.2)	7.9 (0.01)	221.0 (1.7)	80.2 (2.0)	7.4 (0.2)	92
PTL-55	6/6/2024	7:30	n.m.	n.m.	n.m.	n.m.	n.m.	n.m.

°C = degrees Celsius
µS/cm = micro Siemens per centimeter
mg O_2/L = milligrams of oxygen per liter
gpm = gallons per minute
n.m = not measured
standard deviation is indicated within ()
Min 1 – Sample station located in Mineral River
PTL-55 - Sample station located in Portal Creek



Photograph 1. Upstream view of Caribou Creek facing north.



Photograph 2. Downstream view of Caribou Creek facing south.



Photograph 3. Upstream view of Mineral 1 facing east.



Photograph 4. Downstream view of Mineral 1 facing west.



Photograph 5. Upstream view of Perch Creek facing north.



Photograph 6. Downstream view of Perch Creek facing south.



Photograph 7. Upstream view of Pine Creek facing north.



Photograph 8. Downstream view of Pine Creek facing south.



Photograph 9. PTL-55 (Portal Creek) looking upstream (south) in June 2024.

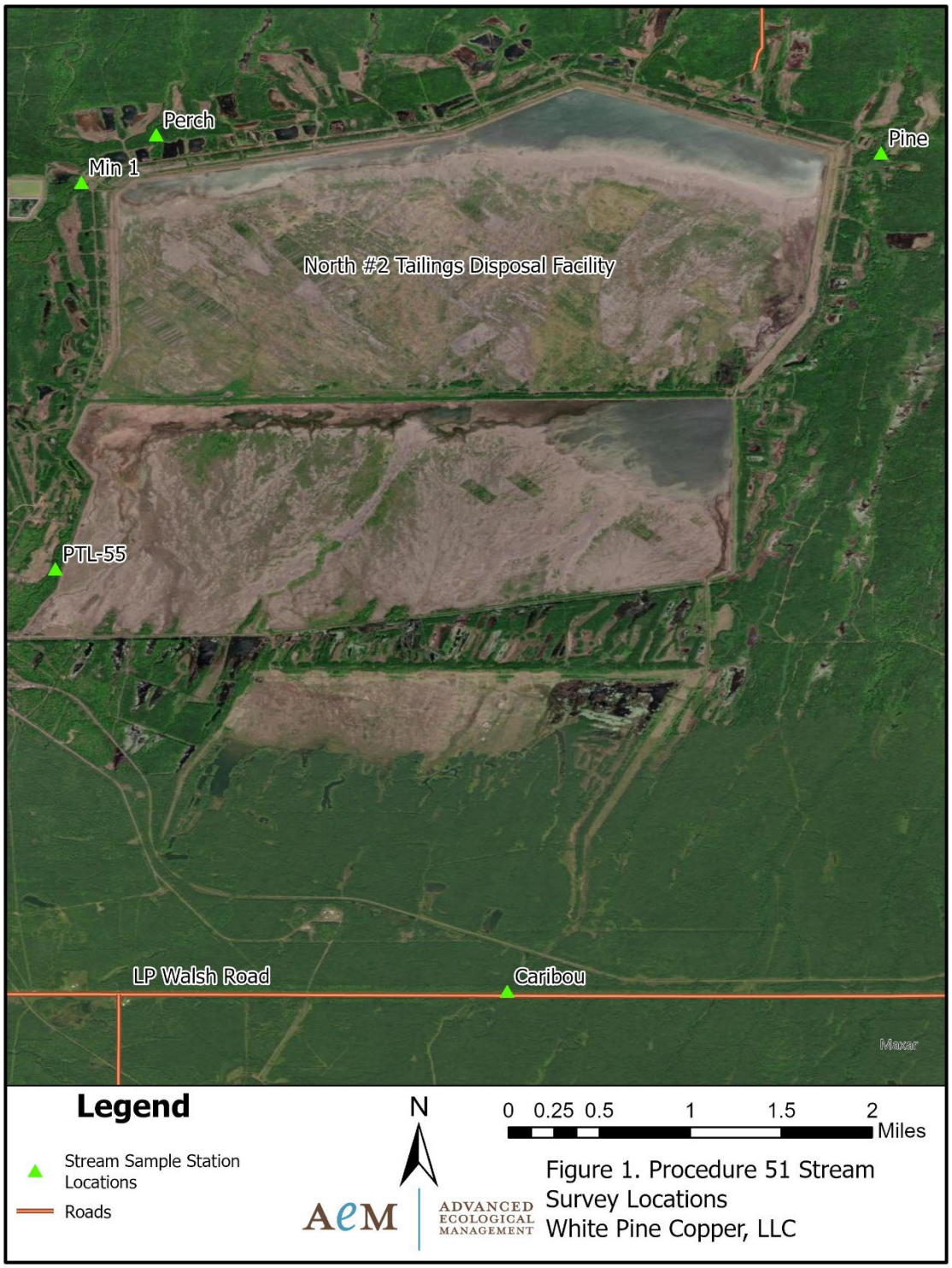


Figure 1. Procedure 51 Stream Survey Locations
White Pine Copper, LLC

Physicochemical Data from White Pine Copper

Stream Characterization
E. coli and Total Phosphorus Sampling
Summary Report

White Pine Copper, Carp Lake Township,
Ontonagon County, Michigan

Prepared by:
Amanda Zeidler
White Pine Copper

October 23, 2024

1. Study Purpose

White Pine Copper LLC completed water quality sampling to determine the physiochemical parameters of Escherichia coli (E. coli) and Total Phosphorus as part of the stream characterization study for the White Pine Copper Project conducted by Barr Engineering. The focus of the study completed by Barr was to characterize "streams" as are regulated by the State of Michigan under Part 301 of the Natural Resources and Environmental Protection Act (NREPA; PA 451 of 1994, as amended) and in accordance with the Michigan Stream Quantification Tool (MiSQT), developed and published by the Michigan Department of Environment, Great Lakes and Energy (EGLE). This report presents a summary of the 2024 field activities and analytical results related to the physiochemical parameters of E. coli and Total Phosphorus for the stream characterization project.

2. Sampling Locations

Samples were collected from the downstream end of each stream identified for survey by Barr Engineering. Table 2-1 and Figure 1, summarize the approximate sampling locations for E. coli and Total Phosphorus.

Table 2-1 Approximate Sampling Locations

Location	Latitude	Longitude
Portal Creek	46.785599	-89.559673
Mineral River	46.803712	-89.556079
Perch Creek	46.804599	-89.549514
Pine Creek	46.804295	-89.492099
Caribou Creek	46.789105	-89.495076

Datum: WGS84 Units: Decimal Degrees

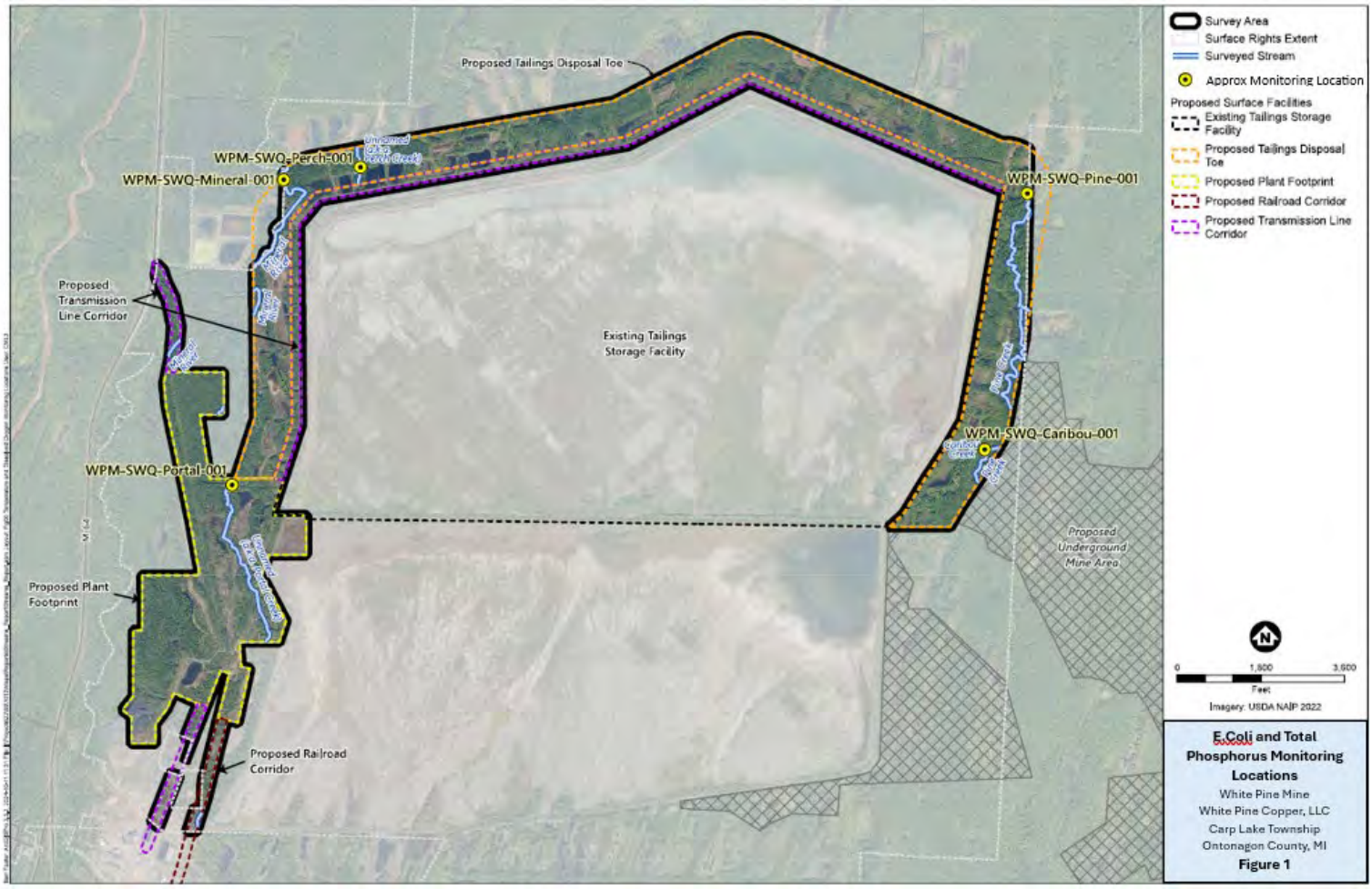


Figure 1. E. coli and Total Phosphorus Approximate Sampling Locations

3. Physiochemical Parameters Evaluated

3.1. Bacteria Parameter

- E. coli - The concentration of the number of colony-forming units (cfu) per 100 mL was assessed at the downstream extent of each stream identified for survey.
- Three sampling events, consisting of three grab samples each, occurred on July 10, July 18, July 24, 2024.

3.2. Nutrients Parameter:

- Total Phosphorus - Concentration was measured at the downstream extent of each stream identified for survey.
- Four sampling events occurred on June 27, July 18, August 14, and September 3, 2024.

4. Sampling Methodology

4.1. E. coli

- Samples were collected following the method described in Michigan's E. coli Water Quality Standard Fact Sheet.
    - Samples were collected in a manner that minimized the disturbance of the bottom sediment and avoided capturing surface films or scums when possible.
    - Sterile containers were obtained from White Water Associates laboratory and samples were collected using nitrile gloved hands to minimize contamination.
    - Three 100 mL grab samples were collected at each location across the stream width; left, center, and right (position when facing upstream).
    - While facing upstream, sample bottles were submerged into the river or creek to a depth of a few inches below the water surface. The sample bottle was capped and placed in a cooler.
    - One field duplicate sample was collected, from the center location, per sampling event and denoted as WPM-SWQ-DUP-001B.
    - Field notes and photos of each location were taken, with the focus on any unusual conditions or activities that may impact the water quality. Copies of all field notes are included in Appendix A.
    - Samples were transported to White Water Associates laboratory within six hours of sample collection.
    - Samples were analyzed for E. coli using Standard Method 9223B. Copies of laboratory reports are included in Appendix B.

4.2. Total Phosphorus

- Samples were collected following the methods described in the 2017 MDEQ Water Chemistry Monitoring Project (WCMP) Quality Assurance Project Plan (QAPP).
    - Sterile containers were obtained from White Water Associates laboratory and samples were collected using nitrile gloved hands to minimize contamination.
    - One 100 mL grab sample was collected at each location in the center of the stream, while facing upstream.
    - If the bottom was soft or steam flow was slowing moving, the sampler stood still for a period of time before sampling to allow the current to sweep away any disturbed sediments.
    - While facing upstream, the sample bottle was submerged into the river or creek, using a gloved hand, to a depth of approximately one-half the water column present. The sample bottle was capped and placed in a cooler.
    - One field duplicate sample was collected per sampling event and denoted as WPM-SWQ-DUP-001.

- Field notes and photos of each location were taken, with the focus on any unusual conditions or activities that may impact the water quality. Copies of all field notes are included in Appendix A.
- Samples were transported to White Water Associates laboratory on the day of collection.
- Samples were analyzed for Total Phosphorus using EPA Method 365.4. Copies of laboratory reports are included in Appendix B.

5. Sample Results

All samples were analyzed by White Water Associates, Inc. located in Amasa, Michigan. Table 5-1 summarizes the Total Phosphorus sample results and Table 5-2 summarizes the E. coli results.

5.1. Total Phosphorus

Table 5-1 Total Phosphorus Sample Results

Monitoring Location	6/27/2024 Total Phosphorus mg/L[1,3]	7/18/2024 Total Phosphorus mg/L[1,3]	8/14/2024 Total Phosphorus mg/L[2,3]	9/03/2024 Total Phosphorus mg/L[2,3]
WPM-SWQ-Portal-001	0.023 J	0.023 J	ND	ND
WPM-SWQ-Mineral-001	0.042 J	0.041 J	ND	ND
WPM-SWQ-Perch-001	ND	0.015 J	ND	ND
WPM-SWQ-Pine-001	0.017 J	0.053	ND	ND
WPM-SWQ-Caribou-001	0.029 J	0.069	0.0091	0.034
WPM-SWQ-DUP-001	--	0.056 (Mineral-001)	ND (Pine-001)	ND (Pine-001)

Notes:

ND = Non-detect, sample result was less than the Method Detection Limit (MDL).

[1] MDL = 0.008 mg/L, Method Quantitation Limit (MQL) = 0.050 mg/L

[2] MDL = 0.005 mg/L, MQL = 0.010 mg/L

[3] Results between the MDL and MQL are considered estimated "J" flagged.

5.2. E. coli

Table 5-2 E. coli Sample Results

Monitoring Location	7/10/2024 E.coli cfu/100mL	7/18/2024 E.coli cfu/100mL	7/24/2024 E.coli cfu/100mL
WPM-SWQ-Portal-001A	52	160	1600
WPM-SWQ-Portal-001B	41	120	1400
WPM-SWQ-Portal-001C	31	52	1600
WPM-SWQ-Mineral-001A	20	31	31
WPM-SWQ-Mineral-001B	20	85	52
WPM-SWQ-Mineral-001C	200	52	63
WPM-SWQ-Perch-001A	ND	ND	10
WPM-SWQ-Perch-001B	ND	ND	31
WPM-SWQ-Perch-001C	ND	ND	ND
WPM-SWQ-Pine-001A	210	230	180
WPM-SWQ-Pine-001B	260	160	290
WPM-SWQ-Pine-001C	180	310	210
WPM-SWQ-Caribou-001A	210	95	31
WPM-SWQ-Caribou-001B	98	75	63
WPM-SWQ-Caribou-001C	110	220	75
WPM-SWQ-DUP-001B	10 (Perch-001B)	41 (Mineral-001B)	1400 (Portal-001B)

Notes:
ND = Non-detect, sample result was less than the MDL (10 cfu/100 mL).

6. References

Michigan Department of Environmental Quality, Water Resources Division, Surface Water Assessment Section. Water Chemistry Monitoring Project (WCMP) Quality Assurance Project Plan (QAPP) 2017 Update. 2017.

Michigan EGLE. Michigan's E Coli Water Quality Standard Fact Sheet. 2019.

Michigan EGLE. Michigan Stream Quantification Tool Data Collection and Analysis Manual MISQT v1.0. December 2020.

Appendix A

Sampling Field Notes

Field Notes – June 27, 2024

Purpose: MiSQT – Phosphorus Sampling, 5 locations

Weather: Sunny, clear skies, 74°F for duration of sampling event

Sampler: Amanda Zeidler, White Pine Copper

Location 1 – Portal Creek (WPM-SWQ-Portal-001)

- Sampled 10:25 am, sampled in the middle of creek approximately three feet upstream from the location marker.
- Collected 1 – 100ml sample in unpreserved plastic bottle, following triplicate rinse with sample water.
    - Total Phosphorus – LL
- Sample had a brown tint in color.
- Small beaver dam located approximately 20 feet upstream
- No unusual observations
- Duplicate collected at 10:30 am, but bottle broke in office when packing coolers, sample was lost.



Location 2 – Mineral River (WPM-SWQ-Mineral-001)

- Sampled 10:55 am, sampled in the middle of the river in line with site marker.
- Collected 1 – 100ml sample in unpreserved plastic bottle, following triplicate rinse with sample water.
    - Total Phosphorus - LL
- Sample had a brown tint in color
- No unusual observations



Location 3 – Perch Creek (WPM-SWQ-Perch-001)

- Sampled 11:15 am, sampled in the middle of the creek in front of large rock
- Collected 1 – 100ml sample in unpreserved plastic bottle, following triplicate rinse with sample water.
    - Total Phosphorus - LL
- Sample was clear in color
- No unusual observations. This location is downstream of the NPDES outfall.



Location 4 – Pine Creek (WPM-SWQ-Pine-001)

- Sampled 11:55 am, sampled in the middle of the creek approximately 5 feet downstream of marker.
- Collected 1 – 100ml sample in unpreserved plastic bottle, following triplicate rinse with sample water.
    - Total Phosphorus - LL
- Sample had brown tint in color
- No unusual observations



Location 5 – Caribou Creek (WPM-SWQ-Caribou-001)

- Sampled 12:20 pm, sampled in the middle of the creek approximately two feet downstream from the location marker.
- Collected 1 – 100ml sample in unpreserved plastic bottle, following triplicate rinse with sample water.
    - Total Phosphorus - LL
- Sample had brown tint in color
- No unusual observations – sample location is very narrow, with soft clay bottom



Version 231011

Job # (WWA office use):

CHAIN-OF-CUSTODY RECORD

WHITE WATER ASSOCIATES, INC.

Amasa MI: PO Box 27, 429 River Ln, Amasa MI 49903, 906-822-7889
Kewaunee WI: 223B Milwaukee St, Kewaunee WI 54216, 920-388-9067

CLIENT NAME / BILL TO	EMAIL ADDRESS
White Pine Copper	azeidler@whitepinecu.com
ADDRESS	**TELEPHONE**
PO Box 338	906-204-6500

CITY	STATE	ZIP	PROJECT NAME / WSSN#
White Pine	MI	49971	

SAMPLER NAME (print first/last name)	COUNTY OF LOCATION	SITE CODE
Amanda Zeidler	Ontonagon	

SAMPLER'S SIGNATURE: Amanda Zeidler

Public Water Suppliers
CIRCLE Sample Type Below
Routine, Repeat, Raw, Process, or Other

TEST / ANALYSIS REQUESTED (Attach list if neeeded)

Unless othersise noted, drinking water reports are sent to the local and/or state requlating agencies

WWA Samp #	SAMPLE ID AND LOCATION (Containers for each sample may be combined on one line)	Sample Collection DATE	Sample Collection TIME	Matrix Code (key below)	(G)rab (C)omp	Filtered	Residual Chlorine	PRESERVATIVES* None	H2SO4	HNO3	HCl	NaOH	Na Thio	G-Trizma	Other: ___	Number of Containers	Total Phosphorus LL	REMARKS (Note any special instructions provided by client or conditions of receipt noted by WWA lab staff.)
	WPM-SWQ-Portal-001	6/27/24	10:25	W				✓								1	✓	Surface water
	WPM-SWQ-Mineral-001	6/27/24	10:55	W				✓								1	✓	
	WPM-SWQ-Perch-001		11:15	W				✓								1	✓	
	WPM-SWQ-Pine-001		11:55	W				✓								1	✓	
	WPM-SWQ-Caribou-001		12:20	W				✓								1	✓	
	~~WPM-SWQ-DUP~~		10:30	W				✓								1	✓	AZ 6/27/24

Relinquished by:	Date:	Time:	Received by:	Date:	Time:
Amanda Zeidler	6/27/24	15:19			
Relinquished by:	Date:	Time:	Received by:	Date:	Time:

Comments:

Packing: Ice ___
Cooler ___

Matrix Code: Drinking Water (**DW**) , Water (**W**), Sediment (**Sd**), Soil/Solid (**S**), TCLP (**TC**), SPLP (**SP**), Other (**O**)

Note: Drinking Water records retained for a minimum of 12 years unless directed by client for regulatory agency *Preservative noted upon arrival, see LIMS for bottle preservation details.

Sample temp (°C) on receipt: obs:_____ corr:_____

UPS☐ FedEx☐ USPS☐ Client☐ Other _____

Field Notes – July 10, 2024

Purpose: MiSQT – E coli Sampling, 5 locations

Weather: Sunny, clear skies, 65-70°F for duration of sampling event

Sampler: Amanda Zeidler, White Pine Copper

Location 1 – Portal Creek (WPM-SWQ-Portal-001)

- Collected one sample at three locations across the stream channel - left, center, right (position when looking upstream) approximately three feet upstream of location marker.
    - WPM-SWQ-Portal-001A (Left), Sample Time – 11:57
    - WPM-SWQ-Portal-001B (Center), Sample Time – 12:01
    - WPM-SWQ-Portal-001C (Right) – 12:04
- 100ml grab samples were collected in plastic bottles containing sodium thiosulfate to be analyzed for E coli.
- Sample had a very faint yellowish-brown tint.
- Small beaver dam located approximately 15 feet upstream.
- Biofilm, likely the result of iron-oxidizing bacteria, was observed on the water surface.




Portal 001B
12:01

Location 2 – Mineral River (WPM-SWQ-Mineral-001)

- Collected one sample at three locations across the stream channel - left, center, right (position when looking upstream) approximately five feet upstream of location marker.
    - WPM-SWQ-Mineral-001A (Left), Sample Time – 11:23
    - WPM-SWQ-Mineral-001B (Center), Sample Time – 11:27
    - WPM-SWQ-Mineral-001C (Right) – 11:30
- 100ml grab samples were collected in plastic bottles containing sodium thiosulfate to be analyzed for E coli.
- Sample had a very faint yellowish-brown tint.
- No unusual observations.

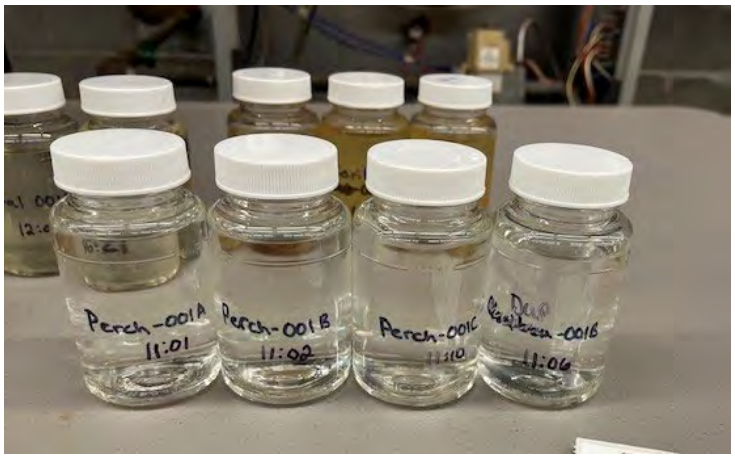




Location 3 – Perch Creek (WPM-SWQ-Perch-001)

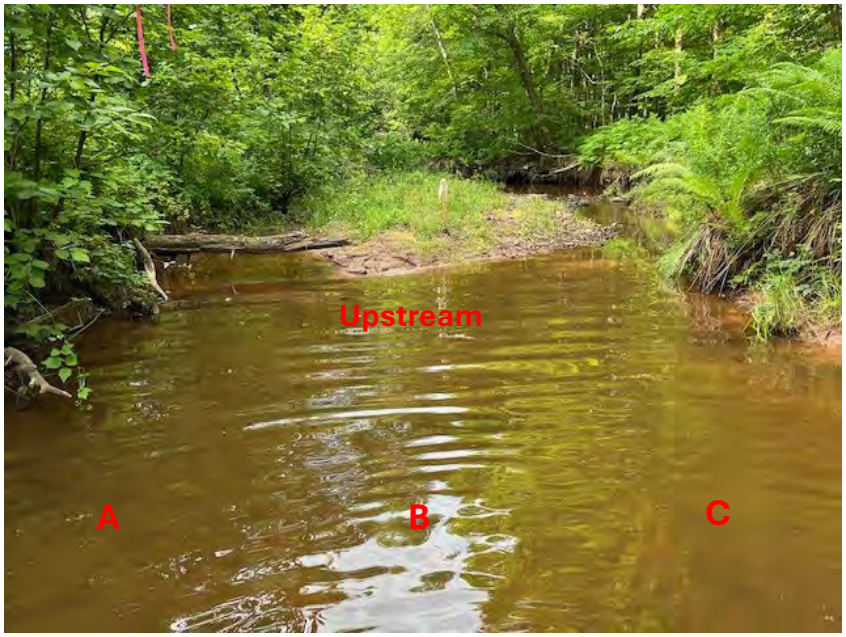
- Collected one sample at three locations across the stream channel - left, center, right (position when looking upstream) Sampled in front of large rock located in the center of the channel.
    - WPM-SWQ-Perch-001A (Left), Sample Time – 11:01
    - WPM-SWQ-Perch-001B (Center), Sample Time – 11:02
    - WPM-SWQ-Perch-001C (Right) – 11:10
    - WPM-SWQ-DUP-001B (Center) – 11:06 (Duplicate Sample)
- 100ml grab samples were collected in plastic bottles containing sodium thiosulfate to be analyzed for E coli.
- Sample was clear in color.
- No unusual observations. This location is downstream of the NPDES outfall.





Location 4 – Pine Creek (WPM-SWQ-Pine-001)

- Collected one sample at three locations across the stream channel - left, center, right (position when looking upstream) approximately five feet downstream of location marker.
    - WPM-SWQ-Pine-001A (Left), Sample Time – 10:30
    - WPM-SWQ-Pine-001B (Center), Sample Time – 10:33
    - WPM-SWQ-Pine-001C (Right) – 10:35
- 100ml grab samples were collected in plastic bottles containing sodium thiosulfate to be analyzed for E coli.
- Sample had a very faint yellowish-brown tint.
- No unusual observations. Stream characterization work being conducted upstream by Barr.





Location 5 – Caribou Creek (WPM-SWQ-Caribou-001)

- Collected one sample at three locations across the stream channel - left, center, right (position when looking upstream) approximately two feet downstream of location marker.
    - WPM-SWQ-Caribou-001A (Left), Sample Time – 10:02
    - WPM-SWQ-Caribou-001B (Center), Sample Time – 10:05
    - WPM-SWQ-Caribou-001C (Right) – 10:08
- 100ml grab samples were collected in plastic bottles containing sodium thiosulfate to be analyzed for E coli.
- Sample had a strong iron/orange tint.
- The stream channel is very narrow with little flow. Water within the sampling location was quite stagnant with an iron bacteria growth on the surface, some of which made it into the sample and settled on the bottom of the sample container.





Version 231011

Job # (WWA office use):

CHAIN-OF-CUSTODY RECORD

WHITE WATER ASSOCIATES, INC.

Amasa MI: PO Box 27, 429 River Ln, Amasa MI 49903, 906-822-7889
Kewaunee WI: 223B Milwaukee St, Kewaunee WI 54216, 920-388-9067

CLIENT NAME / BILL TO	EMAIL ADDRESS
White Pine Copper	azeidler@whitepinecu.com
ADDRESS	**TELEPHONE**
PO Box 338	906-204-6500
CITY / **STATE** / **ZIP**	**PROJECT NAME / WSSN#**
White Pine / MI / 49971	
SAMPLER NAME (print first/last name)	**COUNTY OF LOCATION** / **SITE CODE**
Amanda Zeidler	Ontonagon
SAMPLER'S SIGNATURE	

Public Water Suppliers
CIRCLE Sample Type Below
Routine, Repeat, Raw, Process, or Other

TEST / ANALYSIS REQUESTED (Attach list if neeeded)

Unless othersise noted, drinking water reports are sent to the local and/or state requlating agencies

WWA Samp #	SAMPLE ID AND LOCATION (Containers for each sample may be combined on one line)	Sample Collection DATE	Sample Collection TIME	Matrix Code (key below)	(G)rab (C)omp	Filtered	Residual Chlorine	PRESERVATIVES* None	H2SO4	HNO3	HCl	NaOH	Na Thio	G-Trizma	Other:	Number of Containers	E coli										REMARKS (Note any special instructions provided by client or conditions of receipt noted by WWA lab staff.)
	WPM-SWQ-Portal-001A	7/10/24	11:57	W	G											1	✓										Surface Water
	WPM-SWQ-Portal-001B		12:01													1	✓										
	WPM-SWQ-Portal-001C		12:04													1	✓										
	WPM-SWQ-Mineral-001A		11:23													1	✓										
	WPM-SWQ-Mineral-001B		11:27													1	✓										
	WPM-SWQ-Mineral-001C		11:30													1	✓										
	WPM-SWQ-Perch-001A		11:01													1	✓										
	WPM-SWQ-Perch-001B		11:02													1	✓										
	WPM-SWQ-Perch-001C		11:10													1	✓										
	WPM-SWQ-Pine-001A		10:30													1	✓										
	WPM-SWQ-Pine-001B		10:33													1	✓										
	WPM-SWQ-Pine-001C		10:35													1	✓										

Relinquished by:	Date:	Time:	Received by:	Date:	Time:
	7/10/24	13:56		7.10.24	13:56
Relinquished by:	Date:	Time:	Received by:	Date:	Time:

Comments:

Packing: Ice ☐ Cooler ✓

Matrix Code: Drinking Water (**DW**) , Water (**W**), Sediment (**Sd**), Soil/Solid (**S**), TCLP (**TC**), SPLP (**SP**), Other (**O**)

Note: Drinking Water records retained for a minimum of 12 years unless directed by client for regulatory agency *Preservative noted upon arrival, see LIMS for bottle preservation details.

Sample temp (°C) on receipt: obs: 0.4 corr: 1

UPS☐ FedEx☐ USPS☐ Client☐ Other _____

Version 230419

Job # (WWA office use): 111449

CHAIN-OF-CUSTODY RECORD

WHITE WATER ASSOCIATES, INC.

Amasa MI: PO Box 27, 429 River Ln, Amasa MI 49903, 906-822-7889
Kewaunee WI: 223B Milwaukee St, Kewuanee WI 54216, 920-419-2249

CLIENT NAME / BILL TO	EMAIL ADDRESS
White Pine Copper	azeidler@whitepinecu.com
ADDRESS	**TELEPHONE**
Po Box 338	906-204-6500

CITY	STATE	ZIP	PROJECT NAME / WSSN#
White Pine	MI	49978	

SAMPLER NAME (print first/last name)	COUNTY OF LOCATION	SITE CODE
Amanda Zeidler		

SAMPLER'S SIGNATURE: Amanda Zeidler

Public Systems, in REMARKS state: Sample Type = Routine, Repeat, Raw, Process, or Other.

Preservatives WWA noted upon arrival, database contains bottle preservation details.

TEST / ANALYSIS REQUESTED (Attach list if needed)

Unless otherwise noted, drinking water reports are sent to the local and/or state regulating agencies

	SAMPLE ID AND LOCATION (Containers for each sample may be combined on one line)	Sample Collection DATE	Sample Collection TIME	Matrix Code (key below)	Samp Type (G)rab (C)omp	Filtered	Residual Chlorine	PRESERVATIVES None	H2SO4	HNO3	HCl	NaOH	Na Thio	G-Trizma	Other:	Number of Containers	E coli	REMARKS (Note any special instructions provided by client or conditions of receipt noted by WWA lab staff.)
13	WPM-SWQ-Caribou-001A	7/10/24	10:02	W	G								X			1	✓	Surface water
14	WPM-SWQ-Caribou-001B		10:05													1	✓	
15	WPM-SWQ-Caribou-001C		10:08													1	✓	
16	WPM-SWQ-DUP-001B		11:06													1	✓	
													0					

Relinquished by:	Date:	Time:	Received by:	Date:	Time:
Amanda Zeidler	7/10/24	13:56	Brenda LaChapelle	7-10-24	13:56
Relinquished by:	Date:	Time:	Received by:	Date:	Time:

Comments:

Packing: Ice ✓ Cooler

Matrix Code: Drinking Water (**DW**), Water (**W**), Sediment (**Sd**), Soil/Solid (**S**), TCLP (**TC**), SPLP (**SP**), Other (**O**)

JT 7/11/24

Sample temp (°C) on receipt: obs: 0.4 corr: 1

Note: Drinking Water records retained for a minimum of 12 years unless directed by client for regulatory agency

UPS☐ FedEx☐ USPS☐ Client☒ Other ____

Field Notes – July 18, 2024

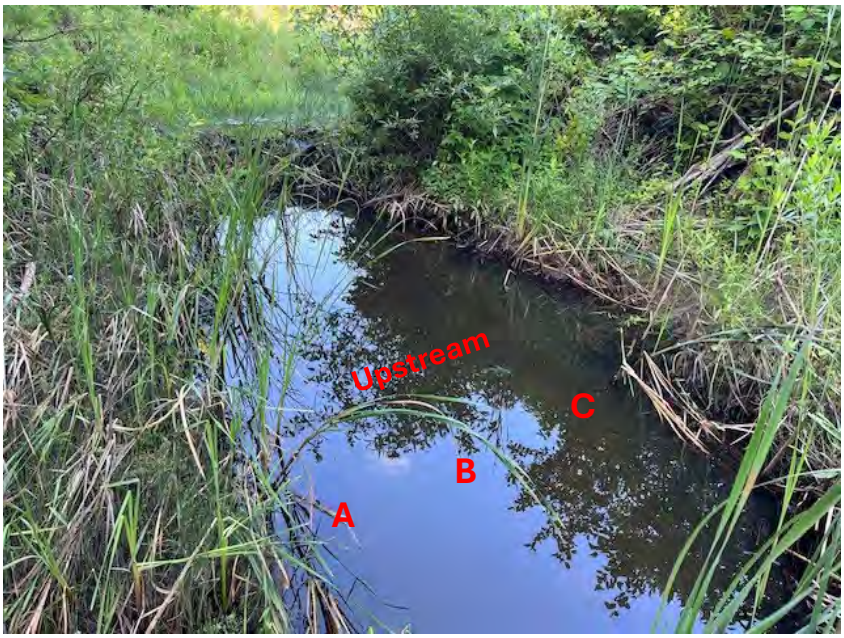
Purpose: MiSQT – E coli & Phosphorus Sampling 5 locations

Weather: Sunny, clear skies, 60-65°F for duration of sampling event

Sampler: Amanda Zeidler, White Pine Copper

Location 1 – Portal Creek (WPM-SWQ-Portal-001)

- 100ml grab samples were collected in plastic bottles containing sodium thiosulfate to be analyzed for E coli.
- Collected one E coli sample at three locations across the stream channel - left, center, right (position when looking upstream) approximately three feet upstream of location marker.
    - WPM-SWQ-Portal-001A (Left), Sample Time – 10:10
    - WPM-SWQ-Portal-001B (Center), Sample Time – 10:12
    - WPM-SWQ-Portal-001C (Right) – 10:15
- Collected one low-level total phosphorus sample in a 100ml plastic, unpreserved bottle from center of creek (location "B"). Triple rinsed with sample water prior to collecting sample. Sample Time – 10:12
- Sample had a very faint yellowish-brown tint.
- Small beaver dam located approximately 15 feet upstream.
- Water level and flow is lower than 7/10/24 sampling event.

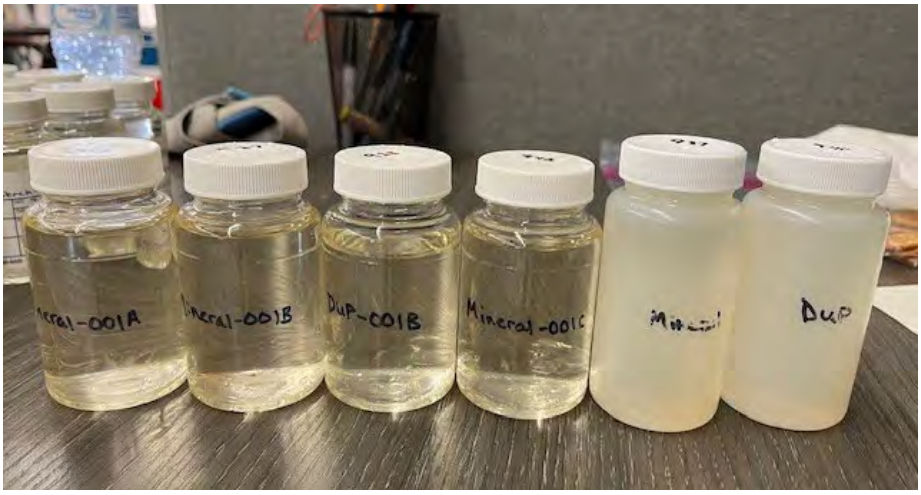



Portal-001A
Portal-001B
Portal-001C
Portal

Location 2 – Mineral River (WPM-SWQ-Mineral-001)

- 100ml grab samples were collected in plastic bottles containing sodium thiosulfate to be analyzed for E coli.
- Collected one sample at three locations across the stream channel - left, center, right (position when looking upstream) approximately five feet upstream of location marker.
    - WPM-SWQ-Mineral-001A (Left), Sample Time – 09:36
    - WPM-SWQ-Mineral-001B (Center), Sample Time – 09:37
    - WPM-SWQ-Mineral-001C (Right) – 09:42
    - WPM-SWQ-DUP-001B (Center), Sample Time – 09:38
- Collected one low-level total phosphorus sample (and Duplicate) in a 100ml plastic, unpreserved bottles from center of creek (location "B"). Triple rinsed with sample water prior to collecting sample. Sample Time – 09:37 (Duplicate – 09:40)
- Sample had a very faint yellowish-brown tint.
- Water level and flow is lower than 7/10/24 sampling event. River is approximately two inches lower than last sampling.





Location 3 – Perch Creek (WPM-SWQ-Perch-001)

- 100ml grab samples were collected in plastic bottles containing sodium thiosulfate to be analyzed for E coli.
- Collected one sample at three locations across the stream channel - left, center, right (position when looking upstream) Sampled in front of large rock located in the center of the channel.
    - WPM-SWQ-Perch-001A (Left), Sample Time – 09:12
    - WPM-SWQ-Perch-001B (Center), Sample Time – 09:13
    - WPM-SWQ-Perch-001C (Right) – 09:15
- Collected one low-level total phosphorus sample in a 100ml plastic, unpreserved bottle from center of creek (location "B"). Triple rinsed with sample water prior to collecting sample. Sample Time – 09:13
- Sample was clear in color.
- Water level was down several inches from 7/10/24 sampling event. This location is downstream of the NPDES outfall. Reduced water volume was observed from the tailings dam outfall which would directly correlate to decreased Perch water level.

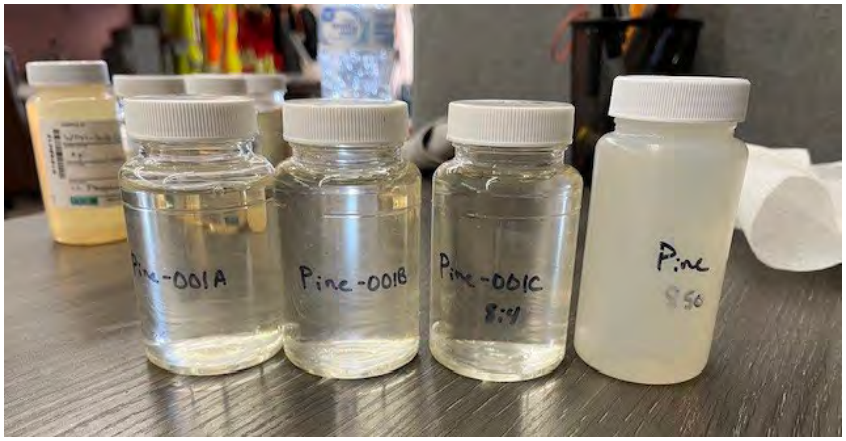




Location 4 – Pine Creek (WPM-SWQ-Pine-001)

- 100ml grab samples were collected in plastic bottles containing sodium thiosulfate to be analyzed for E coli.
- Collected one sample at three locations across the stream channel - left, center, right (position when looking upstream) approximately five feet downstream of location marker.
    - WPM-SWQ-Pine-001A (Left), Sample Time – 08:47
    - WPM-SWQ-Pine-001B (Center), Sample Time – 08:50
    - WPM-SWQ-Pine-001C (Right) – 08:48
- Collected one low-level total phosphorus sample in a 100ml plastic, unpreserved bottle from center of creek (location "B"). Triple rinsed with sample water prior to collecting sample. Sample Time – 08:50
- Sample had a very faint yellowish-brown tint, slightly clearer than previous sampling event.
- No unusual observations. Water level seemed consistent with 7/10/24 sampling event.





Location 5 – Caribou Creek (WPM-SWQ-Caribou-001)

- 100ml grab samples were collected in plastic bottles containing sodium thiosulfate to be analyzed for E coli.
- Collected one sample at three locations across the stream channel - left, center, right (position when looking upstream) approximately two feet downstream of location marker.
    - WPM-SWQ-Caribou-001A (Left), Sample Time – 08:24
    - WPM-SWQ-Caribou-001B (Center), Sample Time – 08:26
    - WPM-SWQ-Caribou-001C (Right) – 08:25
- Collected one low-level total phosphorus sample in a 100ml plastic, unpreserved bottle from center of creek (location "B"). Triple rinsed with sample water prior to collecting sample. Sample Time – 08:26
- Sample had a strong iron/orange tint.
- The stream channel is very narrow with little flow. Water within the sampling location was quite stagnant with an iron bacteria sheen on the surface, some of which made it into sample 001C and settled in the bottom of the sample container. Water level was similar to 7/10/24 sampling event.





Version 231011

Job # (WWA office use):

CHAIN-OF-CUSTODY RECORD

WHITE WATER ASSOCIATES, INC.

Amasa MI: PO Box 27, 429 River Ln, Amasa MI 49903, 906-822-7889
Kewaunee WI: 223B Milwaukee St, Kewaunee WI 54216, 920-388-9067

CLIENT NAME / BILL TO	EMAIL ADDRESS
White Pine Copper	azeidler@whitepinecu.com
ADDRESS	**TELEPHONE**
PO Box 338	906-204-6500

CITY	STATE	ZIP	PROJECT NAME / WSSN#
White Pine	MI	49971	

SAMPLER NAME (print first/last name)	COUNTY OF LOCATION	SITE CODE
Amanda Zeidler	Ontonagon	

SAMPLER'S SIGNATURE: Amanda Zeidler

Public Water Suppliers
CIRCLE Sample Type Below
Routine, Repeat, Raw, Process, or Other

TEST / ANALYSIS REQUESTED (Attach list if needed)

Unless otherwise noted, drinking water reports are sent to the local and/or state regulating agencies

WWA Samp #	SAMPLE ID AND LOCATION (Containers for each sample may be combined on one line)	Sample Collection DATE	Sample Collection TIME	Matrix Code (key below)	(G)rab (C)omp	Filtered	Residual Chlorine	PRESERVATIVES* None	H2SO4	HNO3	HCl	NaOH	Na Thio	G-Trizma	Other:	Number of Containers	E coli	REMARKS (Note any special instructions provided by client or conditions of receipt noted by WWA lab staff.)
	WPM-SWQ-Portal-001A	7-18-24	10:10	W	G								✓			1	✓	Surface water
	WPM-SWQ-Portal-001B		10:12										✓			1	✓	
	WPM-SWQ-Portal-001C		10:15										✓			1	✓	
	WPM-SWQ-Mineral-001A		9:36										✓			1	✓	
	WPM-SWQ-Mineral-001B		9:37										✓			1	✓	
	WPM-SWQ-Mineral-001C		9:42										✓			1	✓	
	WPM-SWQ-Perch-001A		9:12										✓			1	✓	
	WPM-SWQ-Perch-001B		9:13										✓			1	✓	
	WPM-SWQ-Perch-001C		9:15										✓			1	✓	
	WPM-SWQ-Pine-001A		8:47										✓			1	✓	
	WPM-SWQ-Pine-001B		8:50										✓			1	✓	
	WPM-SWQ-Pine-001C	↓	8:48	↓	↓								✓			1	✓	

Relinquished by:	Date:	Time:	Received by:	Date:	Time:
Amanda Zeidler	7-18-24	12:24			
Relinquished by:	Date:	Time:	Received by:	Date:	Time:

Comments:

Packing: Ice ___ Cooler ___

Matrix Code: Drinking Water (**DW**), Water (**W**), Sediment (**Sd**), Soil/Solid (**S**), TCLP (**TC**), SPLP (**SP**), Other (**O**)

Note: Drinking Water records retained for a minimum of 12 years unless directed by client for regulatory agency *Preservative noted upon arrival, see LIMS for bottle preservation details.

Sample temp (°C) on receipt: obs:_____ corr:_____

UPS☐ FedEx☐ USPS☐ Client☐ Other _____

Version 230419

Page: 2 OF 2

Job # (WWA office use):

CHAIN-OF-CUSTODY RECORD

WHITE WATER ASSOCIATES, INC.

Amasa MI: PO Box 27, 429 River Ln, Amasa MI 49903, 906-822-7889
Kewaunee WI: 223B Milwaukee St, Kewaunee WI 54216, 920-419-2249

CLIENT NAME / BILL TO	EMAIL ADDRESS
White Pine Copper	azeidler@whitepinecu.com
ADDRESS	**TELEPHONE**
PO Box 338	906-204-6500

CITY	STATE	ZIP	PROJECT NAME / WSSN#
White Pine	MI	49971	

SAMPLER NAME (print first/last name)	COUNTY OF LOCATION	SITE CODE
Amanda Zeidler	Ontonagon	

SAMPLER'S SIGNATURE: Amanda Zeidler

Public Systems, in REMARKS state: Sample Type = Routine, Repeat, Raw, Process, or Other.

Preservatives WWA noted upon arrival, database contains bottle preservation details.

TEST / ANALYSIS REQUESTED (Attach list if needed)

Unless otherwise noted, drinking water reports are sent to the local and/or state regulating agencies

SAMPLE ID AND LOCATION (Containers for each sample may be combined on one line)	Sample Collection DATE	TIME	Matrix Code (key below)	Samp Type (G)rab (C)omp	Filtered	Residual Chlorine	PRESERVATIVES None	H2SO4	HNO3	HCl	NaOH	Na Thio	G-Trizma	Other:	Number of Containers	Low Level Total Phosphorus	E coli	REMARKS (Note any special instructions provided by client or conditions of receipt noted by WWA lab staff.)
&WPM-SWQ-Caribou-001A	7-18-24	8:24	W	G								✓			1		✓	Surface Water
WPM-SWQ-Caribou-001B		8:26										✓			1		✓	
WPM-SWQ-Caribou-001C		8:25										✓			1		✓	
WPM-SWQ-Portal-001							✓								1	✓		
WPM-SWQ-Mineral-001		9:37					✓								1	✓		
WPM-SWQ-Perch-001		9:13					✓								1	✓		
WPM-SWQ-Pine-001		8:50					✓								1	✓		
WPM-SWQ-Caribou-001		8:26					✓								1	✓		
WPM-SWQ-DUP-001		9:40					✓								1	✓		
WPM-SWQ-DUP-001B		9:38										✓			1		✓	

Relinquished by:	Date:	Time:	Received by:	Date:	Time:
	7-18-24	12:24			
Relinquished by:	Date:	Time:	Received by:	Date:	Time:

Comments:

Packing: Ice ___
Cooler ___

Matrix Code: Drinking Water (**DW**) , Water (**W**), Sediment (**Sd**), Soil/Solid (**S**), TCLP (**TC**), SPLP (**SP**), Other (**O**)

Note: Drinking Water records retained for a minimum of 12 years unless directed by client for regulatory agency

Sample temp (°C) on receipt: obs:_____ corr:_____

UPS☐ FedEx☐ USPS☐ Client☐ Other _____

Field Notes – July 24, 2024

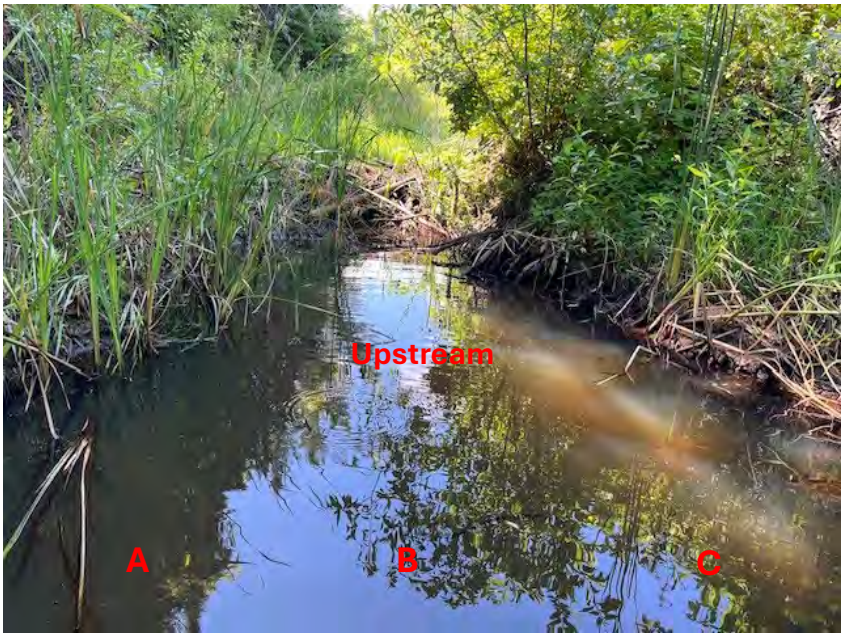
Purpose: MiSQT – E coli Sampling 5 locations

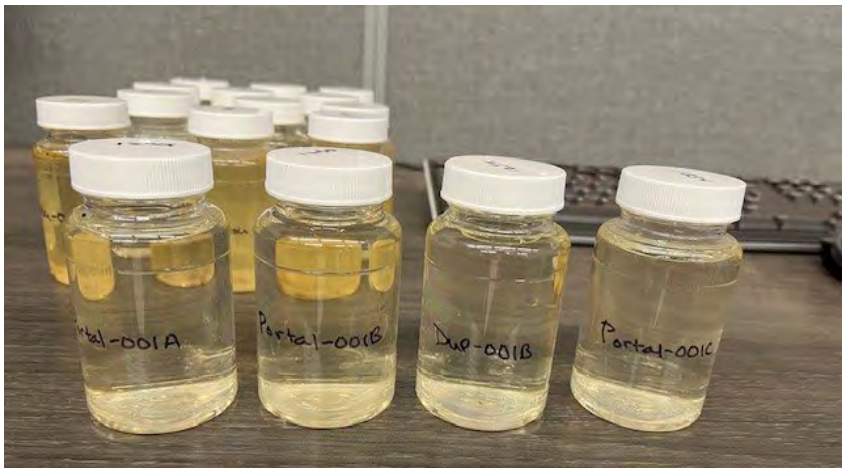
Weather: Sunny, partly cloudy skies, 65°F for duration of sampling event

Sampler: Amanda Zeidler, White Pine Copper

Location 1 – Portal Creek (WPM-SWQ-Portal-001)

- 100ml grab samples were collected in plastic bottles containing sodium thiosulfate to be analyzed for E coli.
- Collected one E coli sample at three locations across the stream channel - left, center, right (position when looking upstream) approximately three feet upstream of location marker.
    - WPM-SWQ-Portal-001A (Left), Sample Time – 12:49
    - WPM-SWQ-Portal-001B (Center), Sample Time – 12:50
    - WPM-SWQ-Portal-001C (Right) – 12:54
    - WPM-SWQ-DUP-001B (Center), Sample Time – 12:52
- Sample had a faint yellowish-brown tint.
- Small beaver dam located approximately 15 feet upstream. Looks to be an active dam.
- Water level and flow is slightly lower than 7/18/24 sampling event.




Portal-001B
Dup-001B
Portal-001C

Location 2 – Mineral River (WPM-SWQ-Mineral-001)

- 100ml grab samples were collected in plastic bottles containing sodium thiosulfate to be analyzed for E coli.
- Collected one sample at three locations across the stream channel - left, center, right (position when looking upstream) approximately five feet upstream of location marker.
    - WPM-SWQ-Mineral-001A (Left), Sample Time – 12:22
    - WPM-SWQ-Mineral-001B (Center), Sample Time – 12:24
    - WPM-SWQ-Mineral-001C (Right) – 12:25
- Sample had a very faint yellowish-brown tint.
- Water level and flow is lower than 7/18/24 sampling event. River is at least one inch lower than last sampling.

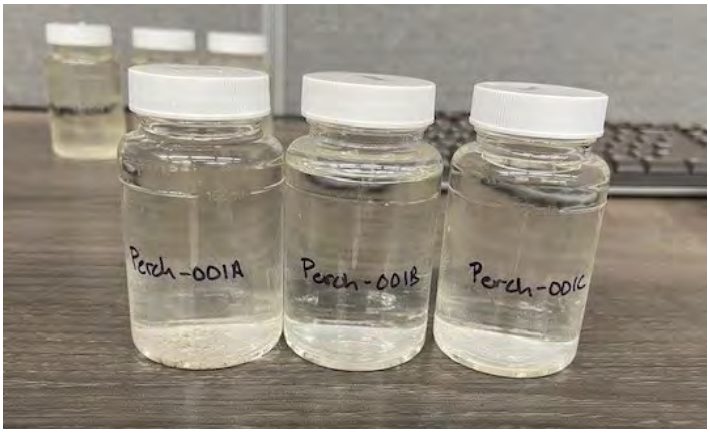




Location 3 – Perch Creek (WPM-SWQ-Perch-001)

- 100ml grab samples were collected in plastic bottles containing sodium thiosulfate to be analyzed for E coli.
- Collected one sample at three locations across the stream channel - left, center, right (position when looking upstream) Sampled in front of large rock located in the center of the channel.
    - WPM-SWQ-Perch-001A (Left), Sample Time – 12:02
    - WPM-SWQ-Perch-001B (Center), Sample Time – 12:04
    - WPM-SWQ-Perch-001C (Right) – 12:05
- Sample was clear in color.
- Water level was down several inches from 7/18/24 sampling event. This location is downstream of the NPDES outfall. Very little water was observed from the tailings dam outfall which would directly correlate to decreased Perch water level.





Location 4 – Pine Creek (WPM-SWQ-Pine-001)

- 100ml grab samples were collected in plastic bottles containing sodium thiosulfate to be analyzed for E coli.
- Collected one sample at three locations across the stream channel - left, center, right (position when looking upstream) approximately five feet downstream of location marker.
    - WPM-SWQ-Pine-001A (Left), Sample Time – 11:39
    - WPM-SWQ-Pine-001B (Center), Sample Time – 11:40
    - WPM-SWQ-Pine-001C (Right) – 11:41
- Sample had a very faint yellowish-brown tint.
- No unusual observations. Water level seemed consistent with 7/18/24 sampling event.

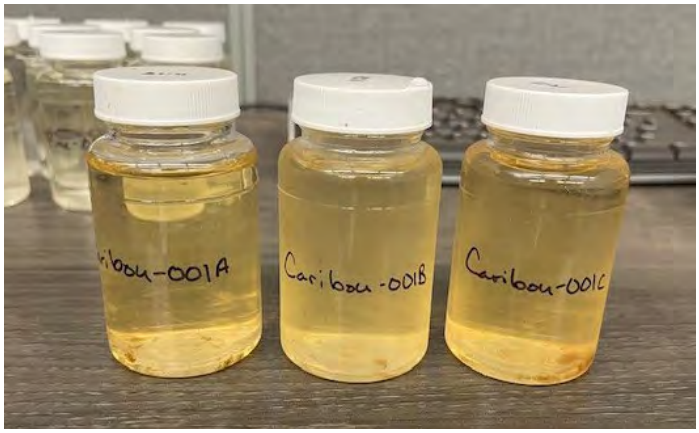




Location 5 – Caribou Creek (WPM-SWQ-Caribou-001)

- 100ml grab samples were collected in plastic bottles containing sodium thiosulfate to be analyzed for E coli.
- Collected one sample at three locations across the stream channel - left, center, right (position when looking upstream) approximately three feet downstream of location marker.
    - WPM-SWQ-Caribou-001A (Left), Sample Time – 11:18
    - WPM-SWQ-Caribou-001B (Center), Sample Time – 11:20
    - WPM-SWQ-Caribou-001C (Right) – 11:21
- Sample had a strong iron/orange tint.
- The stream channel is very narrow with little flow. Water within the sampling location was quite stagnant with an iron bacteria sheen on the surface. Water level was similar to 7/18/24 sampling event.





Week 3

Version 231011

Job # (WWA office use):

CHAIN-OF-CUSTODY RECORD

WHITE WATER ASSOCIATES, INC.

Amasa MI: PO Box 27, 429 River Ln, Amasa MI 49903, 906-822-7889
Kewaunee WI: 223B Milwaukee St, Kewaunee WI 54216, 920-388-9067

CLIENT NAME / BILL TO	EMAIL ADDRESS
White Pine Copper	azeidler@whitepinecu.com
ADDRESS	**TELEPHONE**
PO Box 338	906-204-6500
CITY / **STATE** / **ZIP**	**PROJECT NAME / WSSN#**
White Pine / MI / 49971	
SAMPLER NAME (print first/last name)	**COUNTY OF LOCATION** / **SITE CODE**
Amanda Zeidler	Ontonagon
SAMPLER'S SIGNATURE	**Public Water Suppliers** CIRCLE Sample Type Below: Routine, Repeat, Raw, Process, or Other

TEST / ANALYSIS REQUESTED (Attach list if needed)

Unless otherwise noted, drinking water reports are sent to the local and/or state regulating agencies

WWA Samp #	SAMPLE ID AND LOCATION (Containers for each sample may be combined on one line)	Sample Collection DATE	Sample Collection TIME	Matrix Code (key below)	(G)rab (C)omp	Filtered	Residual Chlorine	PRESERVATIVES* None	H2SO4	HNO3	HCl	NaOH	Na Thio	G-Trizma	Other:	Number of Containers	E coli	REMARKS (Note any special instructions provided by client or conditions of receipt noted by WWA lab staff.)
	WPM-SWQ-Portal-001A	7-24-24	12:49	W	G								✓			1	✓	Surface water
	WPM-SWQ-Portal-001B		12:50										✓			1	✓	
	WPM-SWQ-Portal-001C		12:54										✓			1	✓	
	WPM-SWQ-Mineral-001A		12:22										✓			1	✓	
	WPM-SWQ-Mineral-001B		12:24										✓			1	✓	
	WPM-SWQ-Mineral-001C		12:25										✓			1	✓	
	WPM-SWQ-Perch-001A		12:02										✓			1	✓	
	WPM-SWQ-Perch-001B		12:04										✓			1	✓	
	WPM-SWQ-Perch-001C		12:05										✓			1	✓	
	WPM-SWQ-Pine-001A		11:39										✓			1	✓	
	WPM-SWQ-Pine-001B		11:40										✓			1	✓	
	WPM-SWQ-Pine-001C	↓	11:41	↓	↓								✓			1	✓	↓

Relinquished by:	Date:	Time:	Received by:	Date:	Time:
	7-24-24	14:39		7/24/24	14:39
Relinquished by:	Date:	Time:	Received by:	Date:	Time:

Comments:

Packing: Ice ✓ Cooler

Sample temp (°C) on receipt: obs: 0.7 corr: 1

UPS☐ FedEx☐ USPS☐ Client☒ Other _____

Matrix Code: Drinking Water (**DW**), Water (**W**), Sediment (**Sd**), Soil/Solid (**S**), TCLP (**TC**), SPLP (**SP**), Other (**O**)

Note: Drinking Water records retained for a minimum of 12 years unless directed by client for regulatory agency *Preservative noted upon arrival, see LIMS for bottle preservation details.

Version 230419

Page: 2 OF 2

Job # (WWA office use):

CHAIN-OF-CUSTODY RECORD

WHITE WATER ASSOCIATES, INC.

Amasa MI: PO Box 27, 429 River Ln, Amasa MI 49903, 906-822-7889
Kewaunee WI: 223B Milwaukee St, Kewaunee WI 54216, 920-419-2249

CLIENT NAME / BILL TO	EMAIL ADDRESS
White Pine Copper	azeidler@whitepinecu.com
ADDRESS	**TELEPHONE**
PO Box 338	906-204-6500
CITY / **STATE** / **ZIP**	**PROJECT NAME / WSSN#**
White Pine / MI / 49971	
SAMPLER NAME (print first/last name)	**COUNTY OF LOCATION** / **SITE CODE**
Amanda Zeidler	
SAMPLER'S SIGNATURE	**Public Systems, In REMARKS state:** Sample Type = Routine, Repeat, Raw, Process, or Other. / **Preservatives** WWA noted upon arrival, database contains bottle preservation details.

TEST / ANALYSIS REQUESTED (Attach list if needed)

Unless otherwise noted, drinking water reports are sent to the local and/or state regulating agencies

SAMPLE ID AND LOCATION (Containers for each sample may be combined on one line)	Sample Collection DATE	TIME	Matrix Code (key below)	Samp Type (G)rab (C)omp	Filtered	Residual Chlorine	PRESERVATIVES None	H2SO4	HNO3	HCl	NaOH	Na Thio	G-Trizma	Other:	Number of Containers	E coli	REMARKS (Note any special instructions provided by client or conditions of receipt noted by WWA lab staff.)
WPM-SWQ-Caribou-001A	7-24-24	11:18	W	G								✓			1	✓	Surface water
WPM-SWQ-Caribou-001B		11:20										✓			1	✓	
WPM-SWQ-Caribou-001C		11:21										✓			1	✓	
WPM-SWQ-DUP-001B		12:52	↓	↓								✓			1	✓	

Relinquished by:	Date:	Time:	Received by:	Date:	Time:
	7-24-24	14:39		7-24-24	14:39
Relinquished by:	Date:	Time:	Received by:	Date:	Time:

Comments:

Packing: Ice ✓ Cooler

Sample temp (°C) on receipt: obs: 0.7 corr: 1

UPS☐ FedEx☐ USPS☐ Client☒ Other _____

Matrix Code: Drinking Water (**DW**), Water (**W**), Sediment (**Sd**), Soil/Solid (**S**), TCLP (**TC**), SPLP (**SP**), Other (**O**)

Note: Drinking Water records retained for a minimum of 12 years unless directed by client for regulatory agency

Field Notes – August 14, 2024

Purpose: MiSQT – Phosphorus Sampling, 5 locations

Weather: Sunny, clear skies, 84°F for duration of sampling event

Sampler: Amanda Zeidler

Location 1 – Portal Creek (WPM-SWQ-Portal-001)

- Sampled 10:38 am, sampled in the middle of creek approximately three feet upstream from the location marker.
- Collected 1 – 100ml sample in unpreserved plastic bottle, following triplicate rinse with sample water.
    - Total Phosphorus – LL
- Sample had a very slight brown tint in color, clearer than previous sampling events.
- Small beaver dam located approximately 20 feet upstream. Looks to be an active dam.
- Very slow flow, hardly recognizable, observed during sampling event.



Location 2 – Mineral River (WPM-SWQ-Mineral-001)

- Sampled 10:14 am, sampled in the middle of the river in line with site marker.
- Collected 1 – 100ml sample in unpreserved plastic bottle, following triplicate rinse with sample water.
    - Total Phosphorus - LL
- Sample had a very slight brown tint in color, clearer than previous sampling events.
- Water level low and slow flow observed.



Location 3 – Perch Creek (WPM-SWQ-Perch-001)

- Sampled 09:55 am, sampled in the middle of the creek in front of large rock
- Collected 1 – 100ml sample in unpreserved plastic bottle, following triplicate rinse with sample water.
    - Total Phosphorus - LL
- Sample was clear in color
- This location is downstream of the NPDES outfall.
- Water level very low, slow flow rate.



Location 4 – Pine Creek (WPM-SWQ-Pine-001)

- Sampled 11:40 am, sampled in the middle of the creek approximately 5 feet downstream of marker.
- Collected 1 – 100ml sample in unpreserved plastic bottle and Duplicate Sample, following triplicate rinse with sample water.
    - Total Phosphorus - LL
- Sample had a very slight brown tint in color, clearer than previous sampling events.
- No unusual observations
- Duplicate collected at 11:42 am

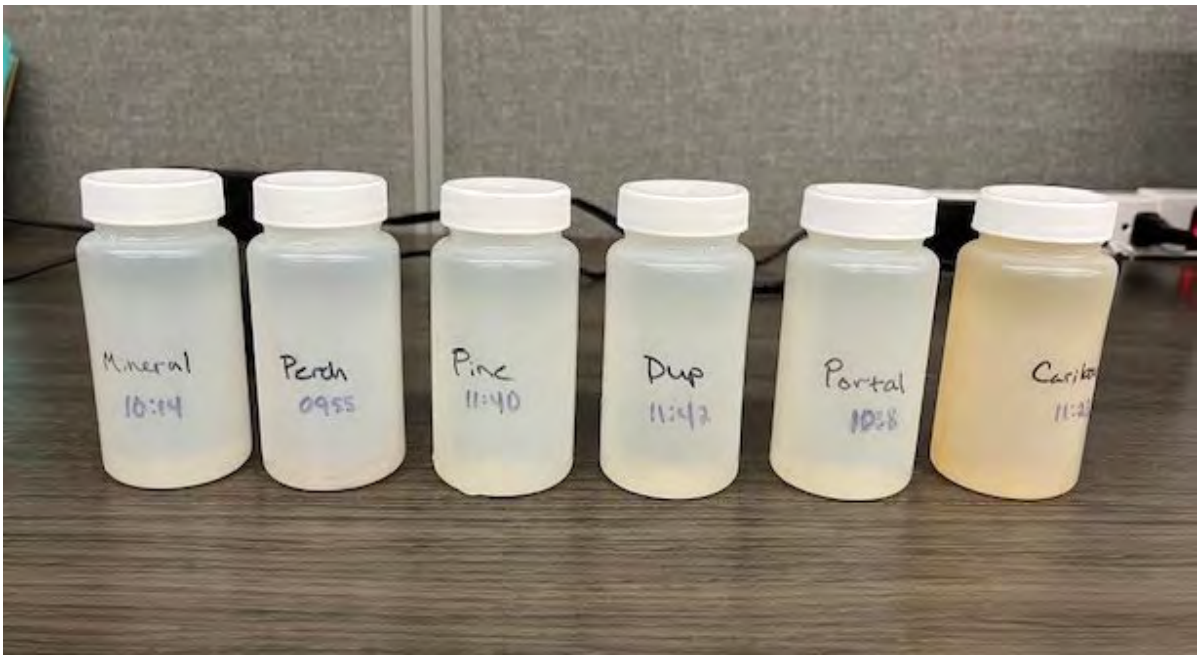


Location 5 – Caribou Creek (WPM-SWQ-Caribou-001)

- Sampled 11:23 pm, sampled in the middle of the creek, approximately two feet downstream from the location marker.
- Collected 1 – 100ml sample in unpreserved plastic bottle, following triplicate rinse with sample water.
    - Total Phosphorus - LL
- Sample had brown tint in color
- No observed flow, water was ponded. Iron bacteria covered the surface which was pushed out of the way to sample.






Mineral
10:14
Perch
0955
Pine
11:40
Dup
11:42
Portal
10:58

Version 230419

Job # (WWA office use):

CHAIN-OF-CUSTODY RECORD

Page: 1 OF 1

WHITE WATER ASSOCIATES, INC.

Amasa MI: PO Box 27, 429 River Ln, Amasa MI 49903, 906-822-7889
Kewaunee WI: 223B Milwaukee St, Kewuanee WI 54216, 920-419-2249

CLIENT NAME / BILL TO	EMAIL ADDRESS
White Pine Copper	azeidler@whitepinecu.com
ADDRESS	**TELEPHONE**
PO Box 338	906-204-6500

CITY	STATE	ZIP	PROJECT NAME / WSSN#
White Pine	MI	49971	

SAMPLER NAME (print first/last name)	COUNTY OF LOCATION	SITE CODE
Amanda Zeidler	Ontonagon	

SAMPLER'S SIGNATURE: Amanda Zeidler

Public Systems, in REMARKS state: Sample Type = Routine, Repeat, Raw, Process, or Other.

Preservatives WWA noted upon arrival, database contains bottle preservation details.

TEST / ANALYSIS REQUESTED (Attach list if neeeded)

Unless othersise noted, drinking water reports are sent to the local and/or state requlating agencies

SAMPLE ID AND LOCATION (Containers for each sample may be combined on one line)	Sample Collection DATE	Sample Collection TIME	Matrix Code (key below)	Samp Type (G)rab (C)omp	Filtered	Residual Chlorine	PRESERVATIVES None	H2SO4	HNO3	HCl	NaOH	Na Thio	G-Trizma	Other:	Number of Containers	Low-Level Total Phosphorus	REMARKS (Note any special instructions provided by client or conditions of receipt noted by WWA lab staff.)
WPM-SWQ-Portal-001	8/14/24	10:38	W				✓								1	✓	Surface Water
WPM-SWQ-Mineral-001	"	10:14	W				✓								1	✓	"
WPM-SWQ-Perch-001	"	09:55	W				✓								1	✓	"
WPM-SWQ-Pine-001	"	11:40	W				✓								1	✓	"
WPM-SWQ-Caribou-001	"	11:23	W				✓								1	✓	"
WPM-SWQ-DUP-001	"	11:42	W				✓								1	✓	"

Relinquished by:	Date:	Time:	Received by:	Date:	Time:
	8/14/24				
Relinquished by:	Date:	Time:	Received by:	Date:	Time:

Comments:

Packing: Ice ___ Cooler ___

Matrix Code: Drinking Water (**DW**), Water (**W**), Sediment (**Sd**), Soil/Solid (**S**), TCLP (**TC**), SPLP (**SP**), Other (**O**)

Note: Drinking Water records retained for a minimum of 12 years unless directed by client for regulatory agency

Sample temp (°C) on receipt: obs:_____ corr:_____

UPS☐ FedEx☐ USPS☐ Client☐ Other _____

Field Notes – September 3, 2024

Purpose: MiSQT – Phosphorus Sampling, 5 locations

Weather: Sunny, clear skies, 75°F for duration of sampling event

Sampler: Amanda Zeidler

Location 1 – Portal Creek (WPM-SWQ-Portal-001)

- Sampled 14:33, sampled in the middle of creek approximately three feet upstream from the location marker.
- Collected 1 – 100ml sample in unpreserved plastic bottle, following triplicate rinse with sample water.
    - Total Phosphorus – LL
- Sample had a very slight brown tint in color.
- Small beaver dam located approximately 20 feet upstream. Beaver dam is active, beaver observed in water near dam.
- Very slow flow observed during sampling event.



Location 2 – Mineral River (WPM-SWQ-Mineral-001)

- Sampled 14:12, sampled in the middle of the river in line with site marker.
- Collected 1 – 100ml sample in unpreserved plastic bottle, following triplicate rinse with sample water.
    - Total Phosphorus - LL
- Sample had a very slight brown tint in color.
- Water level low and slow flow observed.



Location 3 – Perch Creek (WPM-SWQ-Perch-001)

- Sampled 14:00, sampled in the middle of the creek in front of large rock
- Collected 1 – 100ml sample in unpreserved plastic bottle, following triplicate rinse with sample water.
    - Total Phosphorus - LL
- Sample was clear in color.
- This location is downstream of the NPDES outfall.
- Water level very low, slow flow rate.



Location 4 – Pine Creek (WPM-SWQ-Pine-001)

- Sampled 13:33, sampled in the middle of the creek approximately 5 feet downstream of marker.
- Collected 1 – 100ml sample in unpreserved plastic bottle and Duplicate Sample, following triplicate rinse with sample water.
    - Total Phosphorus - LL
- Sample had a very slight brown tint in color.
- No unusual observations.
- Duplicate collected at 13:29.



Location 5 – Caribou Creek (WPM-SWQ-Caribou-001)

- Sampled 13:15, sampled in the middle of the creek, approximately two feet downstream from the location marker.
- Collected 1 – 100ml sample in unpreserved plastic bottle, following triplicate rinse with sample water.
    - Total Phosphorus - LL
- Sample had brown tint in color
- No observed flow, water was ponded. Iron bacteria covered the surface which was pushed out of the way to sample.






Mineral
14:12
Pine
13:33
Dup
13:29
Caribou
13:15
Portal
14:33
Perch
14:00

Version 230419

Job # (WWA office use):

CHAIN-OF-CUSTODY RECORD

WHITE WATER ASSOCIATES, INC.

Amasa MI: PO Box 27, 429 River Ln, Amasa MI 49903, 906-822-7889
Kewaunee WI: 223B Milwaukee St, Kewaunee WI 54216, 920-419-2249

CLIENT NAME / BILL TO	EMAIL ADDRESS
White Pine Copper	azeidler@whitepinecu.com
ADDRESS	**TELEPHONE**
PO Box 338	906-204-6500
CITY / **STATE** / **ZIP**	**PROJECT NAME / WSSN#**
White Pine / MI / 49971	
SAMPLER NAME (print first/last name)	**COUNTY OF LOCATION** / **SITE CODE**
Amanda Zeidler	Ontonagon
SAMPLER'S SIGNATURE	**Public Systems, In REMARKS state:** Sample Type = Routine, Repeat, Raw, Process, or Other. / **Preservatives** WWA noted upon arrival, database contains bottle preservation details.
Amanda Zeidler	

TEST / ANALYSIS REQUESTED (Attach list if needed)

Unless otherwise noted, drinking water reports are sent to the local and/or state regulating agencies

SAMPLE ID AND LOCATION (Containers for each sample may be combined on one line)	Sample Collection: DATE	Sample Collection: TIME	Matrix Code (key below)	Samp Type (G)rab (C)omp	Filtered	Residual Chlorine	PRESERVATIVES: None	H2SO4	HNO3	HCl	NaOH	Na Thio	G-Trizma	Other:	Number of Containers	Low-Level Total Phosphorus	REMARKS (Note any special instructions provided by client or conditions of receipt noted by WWA lab staff.)
WPM-SWQ-Portal-001	9/3/24	14:33	W				✓								1	✓	Surface Water
WPM-SWQ-Mineral-001		14:12	W				✓								1	✓	
WPM-SWQ-Perch-001		14:00	W				✓								1	✓	
WPM-SWQ-Pine-001		13:33	W				✓								1	✓	
WPM-SWQ-Caribou-001		13:15	W				✓								1	✓	
WPM-SWQ-DUP-001	↓	13:29	W				✓								1	✓	↓

Relinquished by:	Date:	Time:	Received by:	Date:	Time:
	9/3/24	17:45			
Relinquished by:	Date:	Time:	Received by:	Date:	Time:

Comments:

Packing: Ice ___ Cooler ___

Matrix Code: Drinking Water (**DW**), Water (**W**), Sediment (**Sd**), Soil/Solid (**S**), TCLP (**TC**), SPLP (**SP**), Other (**O**)

Note: Drinking Water records retained for a minimum of 12 years unless directed by client for regulatory agency

Sample temp (°C) on receipt: obs:_____ corr:_____

UPS☐ FedEx☐ USPS☐ Client☐ Other _____

Appendix B

Laboratory Results

COVER PAGE

WHITE WATER ASSOCIATES, INC.
429 River Lane • PO Box 27 Amasa, MI 49903 • (906) 822-7889

Client: White Pine Copper, LLC **WWA Job #:** 111245

Project: Total Phosphorus

Date Received: 6/27/2024 **Date Reported:** 7/18/2024

Sample Number	Client Sample ID	Date/Time Sampled	Sample Matrix
111245-001	WPM-SWQ-Portal-001	6/27/2024 10:25	Water
111245-002	WPM-SWQ-Mineral-001	6/27/2024 10:55	Water
111245-003	WPM-SWQ-Perch-001	6/27/2024 11:15	Water
111245-004	WPM-SWQ-Pine-001	6/27/2024 11:55	Water
111245-005	WPM-SWQ-Caribou-001	6/27/2024 12:20	Water

Comments (if any):

Key to Laboratory Flags:

*: RPD/RSD exceeds limits.
B: The analyte was found in the associated blank as well as in the sample.
J: The quantitation is an estimated value because the result is less than the sample quantitation limit but greater than the detection limit.
M: A matrix effect was present.
Q: Batch QC data associated with the analysis does not meet the stated objectives
H: Indicates analytical holding time exceedance.

ND = Not Detected, MDL = Method Detection Limit, MQL = Method Quantitation Limit
ppm = mg/L (liquid) or mg/kg (solid), ppb = ug/L (liquid) or ug/kg (solid)
For MI EGLE Coliform, Negative = No Coliform bacteria detected, Positive = Coliform bacteria detected

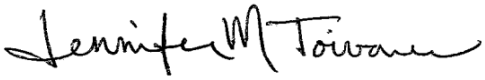
Sample Types:
S = Solids, DW = Drinking water, D = Dissolved, T = Total, TC = TCLP extract, SP = SPLP extract

All samples were received intact and properly preserved unless otherwise noted. The results reported relate only to the samples tested. This report shall not be reproduced, except in full, without the written approval of this laboratory. The Chain of Custody is attached.

This report satisfies the requirements of your project but has not been prepared to comply with NELAP and DoD QSM V5.4 reporting requirements.

I certify that the data contained in this Final Report has been generated and reviewed in accordance with approved methods and White Water Associates Standard Operating Procedures. Exceptions, if any, are discussed in the accompanying sample narrative.

Approved By:
Electronically signed by
Jen Toivonen



WI DNR Lab Certification Number: 999971280
MI EGLE Certification Number: 9306
DoD-ELAP QSM V5.4 Accreditation Number: 65802 by PJLA for Environmental Testing
ISO/IEC 17025:2017 Accredited PJLA 65802

ANALYTICAL REPORT

WHITE WATER ASSOCIATES, INC.
429 River Lane • PO Box 27 Amasa, MI 49903 • (906) 822-7889

Client:	White Pine Copper, LLC	**WWA Job #:**	111245
Project:	Total Phosphorus	**Sample Matrix:**	Water
Date Received:	6/27/2024	**Date Reported:**	7/18/2024

Sample Number | ID | Date/Time Sampled

111245-001 | WPM-SWQ-Portal-001 | 6/27/2024 10:25:00 AM

Test	Result	Flags	Units	Date/Time	Method	Dilution	MDL	MQL	Analyst
General Chemistry Parameters									
Total Phosphorus LL (t)	0.023	J	mg/L	7/11/2024 12:28	365.4	1	0.008	0.050	NK

111245-002 | WPM-SWQ-Mineral-001 | 6/27/2024 10:55:00 AM

Test	Result	Flags	Units	Date/Time	Method	Dilution	MDL	MQL	Analyst
General Chemistry Parameters									
Total Phosphorus LL (t)	0.042	J	mg/L	7/11/2024 12:29	365.4	1	0.008	0.050	NK

111245-003 | WPM-SWQ-Perch-001 | 6/27/2024 11:15:00 AM

Test	Result	Flags	Units	Date/Time	Method	Dilution	MDL	MQL	Analyst
General Chemistry Parameters									
Total Phosphorus LL (t)	ND		mg/L	7/11/2024 12:30	365.4	1	0.008	0.050	NK

111245-004 | WPM-SWQ-Pine-001 | 6/27/2024 11:55:00 AM

Test	Result	Flags	Units	Date/Time	Method	Dilution	MDL	MQL	Analyst
General Chemistry Parameters									
Total Phosphorus LL (t)	0.017	J	mg/L	7/11/2024 12:31	365.4	1	0.008	0.050	NK

111245-005 | WPM-SWQ-Caribou-001 | 6/27/2024 12:20:00 PM

Test	Result	Flags	Units	Date/Time	Method	Dilution	MDL	MQL	Analyst
General Chemistry Parameters									
Total Phosphorus LL (t)	0.029	J	mg/L	7/11/2024 12:34	365.4	1	0.008	0.050	NK

LOGIN CHECKLIST

WHITE WATER ASSOCIATES, INC.
429 River Lane • PO Box 27 Amasa, MI 49903 • (906) 822-7889

Client: White Pine Copper, LLC
Project: Total Phosphorus
Date Received: 6/27/2024

WWA Job #: 111245
Date Reported: 7/18/2024

Date logged in.: 6/27/2024 **Number of coolers:** 1

Login person's initials: BL **Courier/shipper:** Client

- [x] **01) The COC is signed. (either Sampler or Relinquished by)**
- [x] **02) Custody seals/original packing tape were intact (if applicable).**
- [x] **03) Samples are in good condition, i.e. not broken or leaking.**
- [x] **04) Samples matched the Chain of Custody (COC).**
- [x] **05) Samples were received within holding times.**
- [x] **06) Samples were received on ice (in direct contact with the samples).** **Comments:**
- [x] **07) Temperature of the samples was between 0-6°C.** **08) Temp.:** 5.4 (Observed) 6 (Corrected)
- [x] **09) Proper containers were used.**
- [x] **10) Samples were collected in White Water lab containers.**
- [x] **11) There is adequate sample volume for requested analyses and QC.**
- [ ] **12) Samples are preserved to the proper pH. Sample bottles and preservation are noted in LIMS Sample Container Section.**
- [ ] **13) Sub-sampling (SS) is required. Bottles created are noted in sample containers section of log-in form.**
- [ ] **14) For Dissolved Analysis (when applicable), samples were filtered in the lab.**
- [ ] **15) For water VOC samples, headspace is less than the size of a pea.**
- [ ] **16) For soil VOCs, methanol preserved samples were received.**
- [ ] **17) For Soil VOCs, samples were preserved with methanol in the lab.**
- [x] **18) Client contact is necessary. Provide documentation below.**

COMMENTS/CORRECTIVE ACTION

240627 16:13 BL Called client to confirm low level total phosphorus.

CLIENT RESPONSE

240627 16:13 BL Client confirmed low level.

Note: Samples not between 0-6°C that are received at the laboratory on the day of sample collections do not require client notificati

Note: If hold time, volume, and received on ice or temperature criteria are not met when required by the method, results may not be able to be used for regulatory purposes. Check with your reporting agency for more information.

Version 231011

Job # (WWA office use): 111245

CHAIN-OF-CUSTODY RECORD

WHITE WATER ASSOCIATES, INC.

Amasa MI: PO Box 27, 429 River Ln, Amasa MI 49903, 906-822-7889
Kewaunee WI: 223B Milwaukee St, Kewaunee WI 54216, 920-388-9067

CLIENT NAME / BILL TO	EMAIL ADDRESS
White Pine Copper	azeidler@whitepinecu.com
ADDRESS	**TELEPHONE**
PO Box 338	906-204-6500

CITY	STATE	ZIP	PROJECT NAME / WSSN#
White Pine	MI	49971	

SAMPLER NAME (print first/last name)	COUNTY OF LOCATION	SITE CODE
Amanda Zeidler	Ontonagon	

SAMPLER'S SIGNATURE: Amanda Zeidler

Public Water Suppliers
CIRCLE Sample Type Below
Routine, Repeat, Raw, Process, or Other

TEST / ANALYSIS REQUESTED (Attach list if needed)

Unless otherwise noted, drinking water reports are sent to the local and/or state regulating agencies

WWA Samp #	SAMPLE ID AND LOCATION (Containers for each sample may be combined on one line)	Sample Collection DATE	Sample Collection TIME	Matrix Code (key below)	(G)rab (C)omp	Filtered	Residual Chlorine	PRESERVATIVES* None	H2SO4	HNO3	HCl	NaOH	Na Thio	G-Trizma	Other:	Number of Containers	Total Phosphorus	REMARKS (Note any special instructions provided by client or conditions of receipt noted by WWA lab staff.)
1	WPM-SWQ-Portal-001	6/27/24	10:25	W				✓								1	✓	Surface water
2	WPM-SWQ-Mineral-001	6/27/24	10:55	W				✓								1	✓	
3	WPM-SWQ-Perch-001		11:15	W				✓								1	✓	
4	WPM-SWQ-Pine-001		11:55	W				✓								1	✓	
5	WPM-SWQ-Caribou-001		12:20	W				✓								1	✓	
	~~WPM-SWQ-DUP~~		~~10:30~~	W				✓								1	✓	AZ 6/27/24
																		16:13 6/27/24
																		BL - Called
																		client to
																		confirm low
																		level or high.
																		Client confirmed

Relinquished by:	Date:	Time:	Received by:	Date:	Time:
Amanda Zeidler	6/27/24	15:19	Becca Capelle	6.27.24	15:19
Relinquished by:	Date:	Time:	Received by:	Date:	Time:

Comments:

Packing: Ice ✓ Cooler

Matrix Code: Drinking Water (**DW**), Water (**W**), Sediment (**Sd**), Soil/Solid (**S**), TCLP (**TC**), SPLP (**SP**), Other (**O**)

Sample temp (°C) on receipt: obs: 5.4 corr: 6

Note: Drinking Water records retained for a minimum of 12 years unless directed by client for regulatory agency *Preservative noted upon arrival, see LIMS for bottle preservation details.

UPS☐ FedEx☐ USPS☐ Client☑ Other ____

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WHITE WATER ASSOCIATES, INC.
429 River Lane • PO Box 27 Amasa, MI 49903 • (906) 822-7889

Client: White Pine Copper, LLC **WWA Job #:** 111449

Project: Surface Water

Date Received: 7/10/2024 **Date Reported:** 7/19/2024

Sample Number	Client Sample ID	Date/Time Sampled	Sample Matrix
111449-001	WPM-SWQ-Portal-001A	7/10/2024 11:57	Water
111449-002	WPM-SWQ-Portal-001B	7/10/2024 12:01	Water
111449-003	WPM-SWQ-Portal-001C	7/10/2024 12:04	Water
111449-004	WPM-SWQ-Mineral-001A	7/10/2024 11:23	Water
111449-005	WPM-SWQ-Mineral-001B	7/10/2024 11:27	Water
111449-006	WPM-SWQ-Mineral-001C	7/10/2024 11:30	Water
111449-007	WPM-SWQ-Perch-001A	7/10/2024 11:01	Water
111449-008	WPM-SWQ-Perch-001B	7/10/2024 11:02	Water
111449-009	WPM-SWQ-Perch-001C	7/10/2024 11:10	Water
111449-010	WPM-SWQ-Pine-001A	7/10/2024 10:30	Water
111449-011	WPM-SWQ-Pine-001B	7/10/2024 10:33	Water
111449-012	WPM-SWQ-Pine-001C	7/10/2024 10:35	Water
111449-013	WPM-SWQ-Caribou-001A	7/10/2024 10:02	Water
111449-014	WPM-SWQ-Caribou-001B	7/10/2024 10:05	Water
111449-015	WPM-SWQ-Caribou-001C	7/10/2024 10:08	Water
111449-016	WPM-SWQ-DUP-001B	7/10/2024 11:06	Water

WHITE WATER ASSOCIATES, INC.

Client: White Pine Copper, LLC **WWA Job #:** 111449

Comments (if any):

MPN/100mL = CFU/100mL

Key to Laboratory Flags:

*: RPD/RSD exceeds limits.
B: The analyte was found in the associated blank as well as in the sample.
J: The quantitation is an estimated value because the result is less than the sample quantitation limit but greater than the detection limit.
M: A matrix effect was present.
Q: Batch QC data associated with the analysis does not meet the stated objectives
H: Indicates analytical holding time exceedance.

ND = Not Detected, MDL = Method Detection Limit, MQL = Method Quantitation Limit
ppm = mg/L (liquid) or mg/kg (solid), ppb = ug/L (liquid) or ug/kg (solid)
For MI EGLE Coliform, Negative = No Coliform bacteria detected, Positive = Coliform bacteria detected

Sample Types:
S = Solids, DW = Drinking water, D = Dissolved, T = Total, TC = TCLP extract, SP = SPLP extract

All samples were received intact and properly preserved unless otherwise noted. The results reported relate only to the samples tested. This report shall not be reproduced, except in full, without the written approval of this laboratory. The Chain of Custody is attached.

This report satisfies the requirements of your project but has not been prepared to comply with NELAP and DoD QSM V5.4 reporting requirements.

I certify that the data contained in this Final Report has been generated and reviewed in accordance with approved methods and White Water Associates Standard Operating Procedures. Exceptions, if any, are discussed in the accompanying sample narrative.

Approved By:
Electronically signed by
Jen Toivonen

Jennifer M Toivonen

WI DNR Lab Certification Number: 999971280
MI EGLE Certification Number: 9306
DoD-ELAP QSM V5.4 Accreditation Number: 65802 by PJLA for Environmental Testing
ISO/IEC 17025:2017 Accredited PJLA 65802

ANALYTICAL REPORT

WHITE WATER ASSOCIATES, INC.
429 River Lane • PO Box 27 Amasa, MI 49903 • (906) 822-7889

Client:	White Pine Copper, LLC	**WWA Job #:**	111449
Project:	Surface Water	**Sample Matrix:**	Water
Date Received:	7/10/2024	**Date Reported:**	7/19/2024

Sample Number | ID | Date/Time Sampled

111449-001 | WPM-SWQ-Portal-001A | 7/10/2024 11:57:00 AM

Test	Result	Flags	Units	Date/Time	Method	Dilution	MDL	MQL	Analyst
General Chemistry Parameters									
E. coli	52		MPN/100mL	7/10/2024 15:00	9223B	10	10	10	EL

111449-002 | WPM-SWQ-Portal-001B | 7/10/2024 12:01:00 PM

Test	Result	Flags	Units	Date/Time	Method	Dilution	MDL	MQL	Analyst
General Chemistry Parameters									
E. coli	41		MPN/100mL	7/10/2024 15:00	9223B	10	10	10	EL

111449-003 | WPM-SWQ-Portal-001C | 7/10/2024 12:04:00 PM

Test	Result	Flags	Units	Date/Time	Method	Dilution	MDL	MQL	Analyst
General Chemistry Parameters									
E. coli	31		MPN/100mL	7/10/2024 15:00	9223B	10	10	10	EL

111449-004 | WPM-SWQ-Mineral-001A | 7/10/2024 11:23:00 AM

Test	Result	Flags	Units	Date/Time	Method	Dilution	MDL	MQL	Analyst
General Chemistry Parameters									
E. coli	20		MPN/100mL	7/10/2024 15:00	9223B	10	10	10	EL

111449-005 | WPM-SWQ-Mineral-001B | 7/10/2024 11:27:00 AM

Test	Result	Flags	Units	Date/Time	Method	Dilution	MDL	MQL	Analyst
General Chemistry Parameters									
E. coli	20		MPN/100mL	7/10/2024 15:00	9223B	10	10	10	EL

111449-006 | WPM-SWQ-Mineral-001C | 7/10/2024 11:30:00 AM

Test	Result	Flags	Units	Date/Time	Method	Dilution	MDL	MQL	Analyst
General Chemistry Parameters									
E. coli	200		MPN/100mL	7/10/2024 15:00	9223B	10	10	10	EL

111449-007 | WPM-SWQ-Perch-001A | 7/10/2024 11:01:00 AM

Test	Result	Flags	Units	Date/Time	Method	Dilution	MDL	MQL	Analyst
General Chemistry Parameters									
E. coli	ND		MPN/100mL	7/10/2024 15:00	9223B	10	10	10	EL

WHITE WATER ASSOCIATES, INC.
429 River Lane • PO Box 27 Amasa, MI 49903 • (906) 822-7889

Client:	White Pine Copper, LLC	**WWA Job #:**	111449
Project:	Surface Water	**Sample Matrix:**	Water
Date Received:	7/10/2024	**Date Reported:**	7/19/2024

Sample Number | ID | Date/Time Sampled

111449-008 | WPM-SWQ-Perch-001B | 7/10/2024 11:02:00 AM

Test	Result	Flags	Units	Date/Time	Method	Dilution	MDL	MQL	Analyst
General Chemistry Parameters									
E. coli	ND		MPN/100mL	7/10/2024 15:00	9223B	10	10	10	EL

111449-009 | WPM-SWQ-Perch-001C | 7/10/2024 11:10:00 AM

Test	Result	Flags	Units	Date/Time	Method	Dilution	MDL	MQL	Analyst
General Chemistry Parameters									
E. coli	ND		MPN/100mL	7/10/2024 15:00	9223B	10	10	10	EL

111449-010 | WPM-SWQ-Pine-001A | 7/10/2024 10:30:00 AM

Test	Result	Flags	Units	Date/Time	Method	Dilution	MDL	MQL	Analyst
General Chemistry Parameters									
E. coli	210		MPN/100mL	7/10/2024 15:00	9223B	10	10	10	EL

111449-011 | WPM-SWQ-Pine-001B | 7/10/2024 10:33:00 AM

Test	Result	Flags	Units	Date/Time	Method	Dilution	MDL	MQL	Analyst
General Chemistry Parameters									
E. coli	260		MPN/100mL	7/10/2024 15:00	9223B	10	10	10	EL

111449-012 | WPM-SWQ-Pine-001C | 7/10/2024 10:35:00 AM

Test	Result	Flags	Units	Date/Time	Method	Dilution	MDL	MQL	Analyst
General Chemistry Parameters									
E. coli	180		MPN/100mL	7/10/2024 15:00	9223B	10	10	10	EL

111449-013 | WPM-SWQ-Caribou-001A | 7/10/2024 10:02:00 AM

Test	Result	Flags	Units	Date/Time	Method	Dilution	MDL	MQL	Analyst
General Chemistry Parameters									
E. coli	210		MPN/100mL	7/10/2024 15:00	9223B	10	10	10	EL

111449-014 | WPM-SWQ-Caribou-001B | 7/10/2024 10:05:00 AM

Test	Result	Flags	Units	Date/Time	Method	Dilution	MDL	MQL	Analyst
General Chemistry Parameters									
E. coli	98		MPN/100mL	7/10/2024 15:00	9223B	10	10	10	EL

111449-015 | WPM-SWQ-Caribou-001C | 7/10/2024 10:08:00 AM

Test	Result	Flags	Units	Date/Time	Method	Dilution	MDL	MQL	Analyst
General Chemistry Parameters									
E. coli	110		MPN/100mL	7/10/2024 15:00	9223B	10	10	10	EL

WHITE WATER ASSOCIATES, INC.
429 River Lane • PO Box 27 Amasa, MI 49903 • (906) 822-7889

Client:	White Pine Copper, LLC	**WWA Job #:**	111449
Project:	Surface Water	**Sample Matrix:**	Water
Date Received:	7/10/2024	**Date Reported:**	7/19/2024

Sample Number | ID | Date/Time Sampled

111449-016 | WPM-SWQ-DUP-001B | 7/10/2024 11:06:00 AM

Test	Result	Flags	Units	Date/Time	Method	Dilution	MDL	MQL	Analyst
General Chemistry Parameters									
E. coli	10		MPN/100mL	7/10/2024 15:00	9223B	10	10	10	EL

MPN/100mL = CFU/100mL

LOGIN CHECKLIST

WHITE WATER ASSOCIATES, INC.
429 River Lane • PO Box 27 Amasa, MI 49903 • (906) 822-7889

Client: White Pine Copper, LLC
Project: Surface Water
Date Received: 7/10/2024

WWA Job #: 111449
Date Reported: 7/19/2024

Date logged in.: 7/10/2024 **Number of coolers:** 1

Login person's initials: BL **Courier/shipper:** Client

- [x] **01) The COC is signed. (either Sampler or Relinquished by)**
- [x] **02) Custody seals/original packing tape were intact (if applicable).**
- [x] **03) Samples are in good condition, i.e. not broken or leaking.**
- [x] **04) Samples matched the Chain of Custody (COC).**
- [x] **05) Samples were received within holding times.**
- [x] **06) Samples were received on ice (in direct contact with the samples).** **Comments:**
- [x] **07) Temperature of the samples was between 0-6°C.** **08) Temp.:** 0.4 (Observed) 1 (Corrected)
- [x] **09) Proper containers were used.**
- [x] **10) Samples were collected in White Water lab containers.**
- [x] **11) There is adequate sample volume for requested analyses and QC.**
- [ ] **12) Samples are preserved to the proper pH. Sample bottles and preservation are noted in LIMS Sample Container Section.**
- [ ] **13) Sub-sampling (SS) is required. Bottles created are noted in sample containers section of log-in form.**
- [ ] **14) For Dissolved Analysis (when applicable), samples were filtered in the lab.**
- [ ] **15) For water VOC samples, headspace is less than the size of a pea.**
- [ ] **16) For soil VOCs, methanol preserved samples were received.**
- [ ] **17) For Soil VOCs, samples were preserved with methanol in the lab.**
- [ ] **18) Client contact is necessary. Provide documentation below.**

COMMENTS/CORRECTIVE ACTION

CLIENT RESPONSE

Note: Samples not between 0-6°C that are received at the laboratory on the day of sample collections do not require client notificati

Note: If hold time, volume, and received on ice or temperature criteria are not met when required by the method, results may not be able to be used for regulatory purposes. Check with your reporting agency for more information.

Version 231011

Job # (WWA office use): 111449

CHAIN-OF-CUSTODY RECORD

WHITE WATER ASSOCIATES, INC.

Amasa MI: PO Box 27, 429 River Ln, Amasa MI 49903, 906-822-7889
Kewaunee WI: 223B Milwaukee St, Kewaunee WI 54216, 920-388-9067

CLIENT NAME / BILL TO	EMAIL ADDRESS
White Pine Copper	azeidler@whitepinecu.com
ADDRESS	**TELEPHONE**
PO Box 338	906-204-6500
CITY / **STATE** / **ZIP**	**PROJECT NAME / WSSN#**
White Pine / MI / 49971	
SAMPLER NAME (print first/last name)	**COUNTY OF LOCATION** / **SITE CODE**
Amanda Zeidler	Ontonagon
SAMPLER'S SIGNATURE	
Amanda Zeidler	

Public Water Suppliers
CIRCLE Sample Type Below
Routine, Repeat, Raw, Process, or Other

TEST / ANALYSIS REQUESTED (Attach list if needed)

Unless otherwise noted, drinking water reports are sent to the local and/or state regulating agencies

WWA Samp #	SAMPLE ID AND LOCATION (Containers for each sample may be combined on one line)	Sample Collection DATE	Sample Collection TIME	Matrix Code (key below)	(G)rab (C)omp	Filtered	Residual Chlorine	PRESERVATIVES* None	H2SO4	HNO3	HCl	NaOH	Na Thio	G-Trizma	Other:	Number of Containers	E coli	REMARKS (Note any special instructions provided by client or conditions of receipt noted by WWA lab staff.)
1	WPM-SWQ-Portal-001A	7/10/24	11:57	W	G								X			1	✓	Surface Water
2	WPM-SWQ-Portal-001B		12:01													1	✓	
3	WPM-SWQ-Portal-001C		12:04													1	✓	
4	WPM-SWQ-Mineral-001A		11:23													1	✓	
5	WPM-SWQ-Mineral-001B		11:27													1	✓	
6	WPM-SWQ-Mineral-001C		11:30													1	✓	
7	WPM-SWQ-Perch-001A		11:01													1	✓	
8	WPM-SWQ-Perch-001B		11:02													1	✓	
9	WPM-SWQ-Perch-001C		11:10													1	✓	
10	WPM-SWQ-Pine-001A		10:30													1	✓	
11	WPM-SWQ-Pine-001B		10:33													1	✓	
12	WPM-SWQ-Pine-001C	↓	10:35	↓	↓								↓			1	✓	↓

Relinquished by:	Date:	Time:	Received by:	Date:	Time:
Amanda Zeidler	7/10/24	13:56	Becca LaChapelle	7-10-24	13:56
Relinquished by:	Date:	Time:	Received by:	Date:	Time:

Comments:

Packing: Ice ✓ Cooler

Matrix Code: Drinking Water (**DW**), Water (**W**), Sediment (**Sd**), Soil/Solid (**S**), TCLP (**TC**), SPLP (**SP**), Other (**O**)

DJT 7/11/24

Sample temp (°C) on receipt: obs: 0.4 corr: 1

Note: Drinking Water records retained for a minimum of 12 years unless directed by client for regulatory agency *Preservative noted upon arrival, see LIMS for bottle preservation details.

UPS☐ FedEx☐ USPS☐ Client☒ Other _____

Version 230419

Job # (WWA office use): 111449

CHAIN-OF-CUSTODY RECORD

WHITE WATER ASSOCIATES, INC.

Amasa MI: PO Box 27, 429 River Ln, Amasa MI 49903, 906-822-7889
Kewaunee WI: 223B Milwaukee St, Kewuanee WI 54216, 920-419-2249

CLIENT NAME / BILL TO	EMAIL ADDRESS
White Pine Copper	azeidler@whitepinecu.com
ADDRESS	**TELEPHONE**
Po Box 338	906-204-6500

CITY	STATE	ZIP	PROJECT NAME / WSSN#
White Pine	MI	49978	

SAMPLER NAME (print first/last name)	COUNTY OF LOCATION	SITE CODE
Amanda Zeidler		

SAMPLER'S SIGNATURE: Amanda Zeidler

Public Systems, in REMARKS state: Sample Type = Routine, Repeat, Raw, Process, or Other.

Preservatives WWA noted upon arrival, database contains bottle preservation details.

TEST / ANALYSIS REQUESTED (Attach list if needed)

Unless otherwise noted, drinking water reports are sent to the local and/or state regulating agencies

	SAMPLE ID AND LOCATION (Containers for each sample may be combined on one line)	Sample Collection DATE	Sample Collection TIME	Matrix Code (key below)	Samp Type (G)rab (C)omp	Filtered	Residual Chlorine	PRESERVATIVES None	H2SO4	HNO3	HCl	NaOH	Na Thio	G-Trizma	Other:	Number of Containers	E coli	REMARKS (Note any special instructions provided by client or conditions of receipt noted by WWA lab staff.)
13	WPM-SWQ-Caribou-001A	7/10/24	10:02	W	G								X			1	✓	Surface water
14	WPM-SWQ-Caribou-001B	↓	10:05	↓	↓								↓			1	✓	↓
15	WPM-SWQ-Caribou-001C		10:06													1	✓	
16	WPM-SWQ-DUP-001B		11:06													1	✓	
													0					

Relinquished by:	Date:	Time:	Received by:	Date:	Time:	Comments:
Amanda Zeidler	7/10/24	13:56	Brenda LaChapelle	7.10.24	13:56	Packing: Ice ✓ Cooler
Relinquished by:	Date:	Time:	Received by:	Date:	Time:	

Matrix Code: Drinking Water (**DW**), Water (**W**), Sediment (**Sd**), Soil/Solid (**S**), TCLP (**TC**), SPLP (**SP**), Other (**O**)

JT 7/11/24

Sample temp (°C) on receipt: obs: 0.4 corr: 1

Note: Drinking Water records retained for a minimum of 12 years unless directed by client for regulatory agency

UPS☐ FedEx☐ USPS☐ Client☒ Other ____

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WHITE WATER ASSOCIATES, INC.
429 River Lane • PO Box 27 Amasa, MI 49903 • (906) 822-7889

Client: White Pine Copper, LLC **WWA Job #:** 111580

Project: Surface Water

Date Received: 7/18/2024 **Date Reported:** 7/22/2024

Sample Number	Client Sample ID	Date/Time Sampled	Sample Matrix
111580-001	WPM-SWQ-Portal-001A	7/18/2024 10:10	Water
111580-002	WPM-SWQ-Portal-001B	7/18/2024 10:12	Water
111580-003	WPM-SWQ-Portal-001C	7/18/2024 10:15	Water
111580-004	WPM-SWQ-Mineral-001A	7/18/2024 9:36	Water
111580-005	WPM-SWQ-Mineral-001B	7/18/2024 9:37	Water
111580-006	WPM-SWQ-Mineral-001C	7/18/2024 9:42	Water
111580-007	WPM-SWQ-Perch-001A	7/18/2024 9:12	Water
111580-008	WPM-SWQ-Perch-001B	7/18/2024 9:13	Water
111580-009	WPM-SWQ-Perch-001C	7/18/2024 9:15	Water
111580-010	WPM-SWQ-Pine-001A	7/18/2024 8:47	Water
111580-011	WPM-SWQ-Pine-001B	7/18/2024 8:50	Water
111580-012	WPM-SWQ-Pine-001C	7/18/2024 8:48	Water
111580-013	WPM-SWQ-Caribou-001A	7/18/2024 8:24	Water
111580-014	WPM-SWQ-Caribou-001B	7/18/2024 8:26	Water
111580-015	WPM-SWQ-Caribou-001C	7/18/2024 8:25	Water
111580-016	WPM-SWQ-Portal-001	7/18/2024 10:12	Water
111580-017	WPM-SWQ-Mineral-001	7/18/2024 9:37	Water
111580-018	WPM-SWQ-Perch-001	7/18/2024 9:13	Water
111580-019	WPM-SWQ-Pine-001	7/18/2024 8:50	Water
111580-020	WPM-SWQ-Caribou-001	7/18/2024 8:26	Water
111580-021	WPM-SWQ-DUP-001	7/18/2024 9:40	Water
111580-022	WPM-SWQ-DUP-001B	7/18/2024 9:38	Water

WHITE WATER ASSOCIATES, INC.

Client: White Pine Copper, LLC **WWA Job #:** 111580

Comments (if any):

MPN/100mL = CFU/100mL

Key to Laboratory Flags:

*: RPD/RSD exceeds limits.
B: The analyte was found in the associated blank as well as in the sample.
J: The quantitation is an estimated value because the result is less than the sample quantitation limit but greater than the detection limit.
M: A matrix effect was present.
Q: Batch QC data associated with the analysis does not meet the stated objectives
H: Indicates analytical holding time exceedance.

ND = Not Detected, MDL = Method Detection Limit, MQL = Method Quantitation Limit
ppm = mg/L (liquid) or mg/kg (solid), ppb = ug/L (liquid) or ug/kg (solid)
For MI EGLE Coliform, Negative = No Coliform bacteria detected, Positive = Coliform bacteria detected

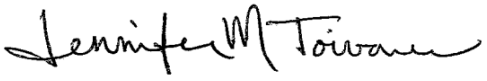
Sample Types:
S = Solids, DW = Drinking water, D = Dissolved, T = Total, TC = TCLP extract, SP = SPLP extract

All samples were received intact and properly preserved unless otherwise noted. The results reported relate only to the samples tested. This report shall not be reproduced, except in full, without the written approval of this laboratory. The Chain of Custody is attached.

This report satisfies the requirements of your project but has not been prepared to comply with NELAP and DoD QSM V5.4 reporting requirements.

I certify that the data contained in this Final Report has been generated and reviewed in accordance with approved methods and White Water Associates Standard Operating Procedures. Exceptions, if any, are discussed in the accompanying sample narrative.

Approved By:
Electronically signed by
Jen Toivonen



WI DNR Lab Certification Number: 999971280
MI EGLE Certification Number: 9306
DoD-ELAP QSM V5.4 Accreditation Number: 65802 by PJLA for Environmental Testing
ISO/IEC 17025:2017 Accredited PJLA 65802

ANALYTICAL REPORT

WHITE WATER ASSOCIATES, INC.
429 River Lane • PO Box 27 Amasa, MI 49903 • (906) 822-7889

Client:	White Pine Copper, LLC	**WWA Job #:**	111580
Project:	Surface Water	**Sample Matrix:**	Water
Date Received:	7/18/2024	**Date Reported:**	7/22/2024

Sample Number | ID | Sample Type | Date/Time Sampled

111580-001 | WPM-SWQ-Portal-001A | Grab | 7/18/2024 10:10:00 AM

Test	Result	Flags	Units	Date/Time	Method	Dilution	MDL	MQL	Analyst
General Chemistry Parameters									
E. coli	160		MPN/100mL	7/18/2024 14:02	9223B	10	10	10	ND

111580-002 | WPM-SWQ-Portal-001B | Grab | 7/18/2024 10:12:00 AM

Test	Result	Flags	Units	Date/Time	Method	Dilution	MDL	MQL	Analyst
General Chemistry Parameters									
E. coli	120		MPN/100mL	7/18/2024 14:02	9223B	10	10	10	ND

111580-003 | WPM-SWQ-Portal-001C | Grab | 7/18/2024 10:15:00 AM

Test	Result	Flags	Units	Date/Time	Method	Dilution	MDL	MQL	Analyst
General Chemistry Parameters									
E. coli	52		MPN/100mL	7/18/2024 14:02	9223B	10	10	10	ND

111580-004 | WPM-SWQ-Mineral-001A | Grab | 7/18/2024 9:36:00 AM

Test	Result	Flags	Units	Date/Time	Method	Dilution	MDL	MQL	Analyst
General Chemistry Parameters									
E. coli	31		MPN/100mL	7/18/2024 14:02	9223B	10	10	10	ND

111580-005 | WPM-SWQ-Mineral-001B | Grab | 7/18/2024 9:37:00 AM

Test	Result	Flags	Units	Date/Time	Method	Dilution	MDL	MQL	Analyst
General Chemistry Parameters									
E. coli	85		MPN/100mL	7/18/2024 14:02	9223B	10	10	10	ND

111580-006 | WPM-SWQ-Mineral-001C | Grab | 7/18/2024 9:42:00 AM

Test	Result	Flags	Units	Date/Time	Method	Dilution	MDL	MQL	Analyst
General Chemistry Parameters									
E. coli	52		MPN/100mL	7/18/2024 14:02	9223B	10	10	10	ND

111580-007 | WPM-SWQ-Perch-001A | Grab | 7/18/2024 9:12:00 AM

Test	Result	Flags	Units	Date/Time	Method	Dilution	MDL	MQL	Analyst
General Chemistry Parameters									
E. coli	ND		MPN/100mL	7/18/2024 14:02	9223B	10	10	10	ND

WHITE WATER ASSOCIATES, INC.
429 River Lane • PO Box 27 Amasa, MI 49903 • (906) 822-7889

Client:	White Pine Copper, LLC	**WWA Job #:**	111580
Project:	Surface Water	**Sample Matrix:**	Water
Date Received:	7/18/2024	**Date Reported:**	7/22/2024

Sample Number | ID | Sample Type | Date/Time Sampled

111580-008 | WPM-SWQ-Perch-001B | Grab | 7/18/2024 9:13:00 AM

Test	Result	Flags	Units	Date/Time	Method	Dilution	MDL	MQL	Analyst
General Chemistry Parameters									
E. coli	ND		MPN/100mL	7/18/2024 14:02	9223B	10	10	10	ND

111580-009 | WPM-SWQ-Perch-001C | Grab | 7/18/2024 9:15:00 AM

Test	Result	Flags	Units	Date/Time	Method	Dilution	MDL	MQL	Analyst
General Chemistry Parameters									
E. coli	ND		MPN/100mL	7/18/2024 14:02	9223B	10	10	10	ND

111580-010 | WPM-SWQ-Pine-001A | Grab | 7/18/2024 8:47:00 AM

Test	Result	Flags	Units	Date/Time	Method	Dilution	MDL	MQL	Analyst
General Chemistry Parameters									
E. coli	230		MPN/100mL	7/18/2024 14:02	9223B	10	10	10	ND

111580-011 | WPM-SWQ-Pine-001B | Grab | 7/18/2024 8:50:00 AM

Test	Result	Flags	Units	Date/Time	Method	Dilution	MDL	MQL	Analyst
General Chemistry Parameters									
E. coli	160		MPN/100mL	7/18/2024 14:02	9223B	10	10	10	ND

111580-012 | WPM-SWQ-Pine-001C | Grab | 7/18/2024 8:48:00 AM

Test	Result	Flags	Units	Date/Time	Method	Dilution	MDL	MQL	Analyst
General Chemistry Parameters									
E. coli	310		MPN/100mL	7/18/2024 14:02	9223B	10	10	10	ND

111580-013 | WPM-SWQ-Caribou-001A | Grab | 7/18/2024 8:24:00 AM

Test	Result	Flags	Units	Date/Time	Method	Dilution	MDL	MQL	Analyst
General Chemistry Parameters									
E. coli	95		MPN/100mL	7/18/2024 14:02	9223B	10	10	10	ND

111580-014 | WPM-SWQ-Caribou-001B | Grab | 7/18/2024 8:26:00 AM

Test	Result	Flags	Units	Date/Time	Method	Dilution	MDL	MQL	Analyst
General Chemistry Parameters									
E. coli	75		MPN/100mL	7/18/2024 14:02	9223B	10	10	10	ND

111580-015 | WPM-SWQ-Caribou-001C | Grab | 7/18/2024 8:25:00 AM

Test	Result	Flags	Units	Date/Time	Method	Dilution	MDL	MQL	Analyst
General Chemistry Parameters									
E. coli	220		MPN/100mL	7/18/2024 14:02	9223B	10	10	10	ND

WHITE WATER ASSOCIATES, INC.
429 River Lane • PO Box 27 Amasa, MI 49903 • (906) 822-7889

Client:	White Pine Copper, LLC	**WWA Job #:**	111580
Project:	Surface Water	**Sample Matrix:**	Water
Date Received:	7/18/2024	**Date Reported:**	7/22/2024

Sample Number | ID | Sample Type | Date/Time Sampled

111580-016 | WPM-SWQ-Portal-001 | Grab | 7/18/2024 10:12:00 AM

Test	Result	Flags	Units	Date/Time	Method	Dilution	MDL	MQL	Analyst
General Chemistry Parameters									
Total Phosphorus LL (t)	0.023	J	mg/L	7/19/2024 16:25	365.4	1	0.008	0.050	NK

111580-017 | WPM-SWQ-Mineral-001 | Grab | 7/18/2024 9:37:00 AM

Test	Result	Flags	Units	Date/Time	Method	Dilution	MDL	MQL	Analyst
General Chemistry Parameters									
Total Phosphorus LL (t)	0.041	J	mg/L	7/19/2024 16:27	365.4	1	0.008	0.050	NK

111580-018 | WPM-SWQ-Perch-001 | Grab | 7/18/2024 9:13:00 AM

Test	Result	Flags	Units	Date/Time	Method	Dilution	MDL	MQL	Analyst
General Chemistry Parameters									
Total Phosphorus LL (t)	0.015	J	mg/L	7/19/2024 16:28	365.4	1	0.008	0.050	NK

111580-019 | WPM-SWQ-Pine-001 | Grab | 7/18/2024 8:50:00 AM

Test	Result	Flags	Units	Date/Time	Method	Dilution	MDL	MQL	Analyst
General Chemistry Parameters									
Total Phosphorus LL (t)	0.053		mg/L	7/19/2024 16:29	365.4	1	0.008	0.050	NK

111580-020 | WPM-SWQ-Caribou-001 | Grab | 7/18/2024 8:26:00 AM

Test	Result	Flags	Units	Date/Time	Method	Dilution	MDL	MQL	Analyst
General Chemistry Parameters									
Total Phosphorus LL (t)	0.069		mg/L	7/19/2024 16:29	365.4	1	0.008	0.050	NK

111580-021 | WPM-SWQ-DUP-001 | Grab | 7/18/2024 9:40:00 AM

Test	Result	Flags	Units	Date/Time	Method	Dilution	MDL	MQL	Analyst
General Chemistry Parameters									
Total Phosphorus LL (t)	0.056		mg/L	7/19/2024 16:30	365.4	1	0.008	0.050	NK

111580-022 | WPM-SWQ-DUP-001B | Grab | 7/18/2024 9:38:00 AM

Test	Result	Flags	Units	Date/Time	Method	Dilution	MDL	MQL	Analyst
General Chemistry Parameters									
E. coli	41		MPN/100mL	7/18/2024 14:02	9223B	10	1	1	ND

MPN/100mL = CFU/100mL

LOGIN CHECKLIST

WHITE WATER ASSOCIATES, INC.
429 River Lane • PO Box 27 Amasa, MI 49903 • (906) 822-7889

Client: White Pine Copper, LLC
Project: Surface Water
Date Received: 7/18/2024

WWA Job #: 111580
Date Reported: 7/22/2024

Date logged in.: 7/18/2024 **Number of coolers:** 1

Login person's initials: BL **Courier/shipper:** Client

- [x] **01) The COC is signed. (either Sampler or Relinquished by)**
- [x] **02) Custody seals/original packing tape were intact (if applicable).**
- [x] **03) Samples are in good condition, i.e. not broken or leaking.**
- [x] **04) Samples matched the Chain of Custody (COC).**
- [x] **05) Samples were received within holding times.**
- [x] **06) Samples were received on ice (in direct contact with the samples).** **Comments:**
- [x] **07) Temperature of the samples was between 0-6°C.** **08) Temp.:** 2.0 (Observed) 2 (Corrected)
- [x] **09) Proper containers were used.**
- [x] **10) Samples were collected in White Water lab containers.**
- [x] **11) There is adequate sample volume for requested analyses and QC.**
- [ ] **12) Samples are preserved to the proper pH. Sample bottles and preservation are noted in LIMS Sample Container Section.**
- [ ] **13) Sub-sampling (SS) is required. Bottles created are noted in sample containers section of log-in form.**
- [ ] **14) For Dissolved Analysis (when applicable), samples were filtered in the lab.**
- [ ] **15) For water VOC samples, headspace is less than the size of a pea.**
- [ ] **16) For soil VOCs, methanol preserved samples were received.**
- [ ] **17) For Soil VOCs, samples were preserved with methanol in the lab.**
- [ ] **18) Client contact is necessary. Provide documentation below.**

COMMENTS/CORRECTIVE ACTION

CLIENT RESPONSE

Note: Samples not between 0-6°C that are received at the laboratory on the day of sample collections do not require client notificati

Note: If hold time, volume, and received on ice or temperature criteria are not met when required by the method, results may not be able to be used for regulatory purposes. Check with your reporting agency for more information.

Week 2

Version 231011

Job # (WWA office use): 111580

CHAIN-OF-CUSTODY RECORD

WHITE WATER ASSOCIATES, INC.

Amasa MI: PO Box 27, 429 River Ln, Amasa MI 49903, 906-822-7889
Kewaunee WI: 223B Milwaukee St, Kewaunee WI 54216, 920-388-9067

CLIENT NAME / BILL TO	EMAIL ADDRESS
White Pine Copper	azeidler@whitepinecu.com
ADDRESS	**TELEPHONE**
PO Box 338	906-204-6500

CITY	STATE	ZIP	PROJECT NAME / WSSN#
White Pine	MI	49971	

SAMPLER NAME (print first/last name)	COUNTY OF LOCATION	SITE CODE
Amanda Zeidler	Ontonagon	

SAMPLER'S SIGNATURE: Amanda Zeidler

Public Water Suppliers
CIRCLE Sample Type Below
Routine, Repeat, Raw, Process, or Other

TEST / ANALYSIS REQUESTED (Attach list if needed)

Unless otherwise noted, drinking water reports are sent to the local and/or state regulating agencies

WWA Samp #	SAMPLE ID AND LOCATION (Containers for each sample may be combined on one line)	Sample Collection DATE	Sample Collection TIME	Matrix Code (key below)	(G)rab (C)omp	Filtered	Residual Chlorine	PRESERVATIVES* None	H2SO4	HNO3	HCl	NaOH	Na Thio	G-Trizma	Other:	Number of Containers	E coli	REMARKS (Note any special instructions provided by client or conditions of receipt noted by WWA lab staff.)
1	WPM-SWQ-Portal-001A	7-18-24	10:10	W	G								✓			1	✓	Surface water
2	WPM-SWQ-Portal-001B		10:12										✓			1	✓	
3	WPM-SWQ-Portal-001C		10:15										✓			1	✓	
4	WPM-SWQ-Mineral-001A		9:36										✓			1	✓	
5	WPM-SWQ-Mineral-001B		9:37										✓			1	✓	
6	WPM-SWQ-Mineral-001C		9:42										✓			1	✓	
7	WPM-SWQ-Perch-001A		9:12										✓			1	✓	
8	WPM-SWQ-Perch-001B		9:13										✓			1	✓	
9	WPM-SWQ-Perch-001C		9:15										✓			1	✓	
10	WPM-SWQ-Pine-001A		8:47										✓			1	✓	
11	WPM-SWQ-Pine-001B		8:50										✓			1	✓	
12	WPM-SWQ-Pine-001C	↓	8:48	↓	↓								✓			1	✓	↓

Relinquished by:	Date:	Time:	Received by:	Date:	Time:
Amanda Zeidler	7-18-24	12:24			
Relinquished by:	Date:	Time:	Received by:	Date:	Time:
			Nicole A. Kunak	7/18/24	12:24

Comments:

Packing: Ice ✓
Cooler ✓

Matrix Code: Drinking Water (DW), Water (W), Sediment (Sd), Soil/Solid (S), TCLP (TC), SPLP (SP), Other (O)

Sample temp (°C) on receipt: obs: 2.0 corr: 2°C

Note: Drinking Water records retained for a minimum of 12 years unless directed by client for regulatory agency. *Preservative noted upon arrival, see LIMS for bottle preservation details.

UPS☐ FedEx☐ USPS☐ Client☑ Other ____

Version 230419

Job # (WWA office use): 111580

CHAIN-OF-CUSTODY RECORD

WHITE WATER ASSOCIATES, INC.

Amasa MI: PO Box 27, 429 River Ln, Amasa MI 49903, 906-822-7889
Kewaunee WI: 223B Milwaukee St, Kewaunee WI 54216, 920-419-2249

CLIENT NAME / BILL TO	EMAIL ADDRESS
White Pine Copper	azeidler@whitepinecu.com
ADDRESS	**TELEPHONE**
PO Box 338	906-204-6500
CITY / **STATE** / **ZIP**	**PROJECT NAME / WSSN#**
White Pine / MI / 49971	
SAMPLER NAME (print first/last name)	**COUNTY OF LOCATION** / **SITE CODE**
Amanda Zeidler	Ontonagon
SAMPLER'S SIGNATURE	**Public Systems, in REMARKS state:** Sample Type = Routine, Repeat, Raw, Process, or Other. / **Preservatives** WWA noted upon arrival, database contains bottle preservation details.

TEST / ANALYSIS REQUESTED (Attach list if needed) — Unless otherwise noted, drinking water reports are sent to the local and/or state regulating agencies

	SAMPLE ID AND LOCATION (Containers for each sample may be combined on one line)	Sample Collection: DATE	TIME	Matrix Code (key below)	Samp Type (G)rab (C)omp	Filtered	Residual Chlorine	PRESERVATIVES: None	H2SO4	HNO3	HCl	NaOH	Na Thio	G-Trizma	Other:	Number of Containers	Low Level Total Phosphorus	E coli								REMARKS (Note any special instructions provided by client or conditions of receipt noted by WWA lab staff.)
13	WPM-SLOQ-Caribou-001A	7-18-24	8:24	W	G								✓			1		✓								Surface Water
14	WPM-SLOQ-Caribou-001B		8:26										✓			1		✓								
15	WPM-SLOQ-Caribou-001C		8:25										✓			1		✓								
16	WPM-SLOQ-Portal-001	per bottle (1) label	10:12					✓					✓			1	✓									
17	WPM-SLOQ-Mineral-001		9:37					✓					✓			1	✓									
18	WPM-SLOQ-Perch-001		9:13					✓								1	✓									
19	WPM-SLOQ-Pine-001		8:50					✓								1	✓									
20	WPM-SLOQ-Caribou-001		8:26					✓								1	✓									
21	WPM-SLOQ-DUP-001		9:40					✓								1	✓									
22	WPM-SLOQ-DUP-001B	↓	9:38	↓	↓								✓			1		✓								↓

Relinquished by:	Date:	Time:	Received by:	Date:	Time:
	7-18-24	12:24			
Relinquished by:	Date:	Time:	Received by:	Date:	Time:
			Nicole A. Kwak	7/18/24	12:24

Comments:

Packing: Ice ✓ Cooler ✓

Matrix Code: Drinking Water (**DW**), Water (**W**), Sediment (**Sd**), Soil/Solid (**S**), TCLP (**TC**), SPLP (**SP**), Other (**O**)

Sample temp (°C) on receipt: obs: 2.0 corr: 2°C

Note: Drinking Water records retained for a minimum of 12 years unless directed by client for regulatory agency

UPS☐ FedEx☐ USPS☐ Client☐ Other _____

OBL 7/18/24

COVER PAGE

WHITE WATER ASSOCIATES, INC.
429 River Lane • PO Box 27 Amasa, MI 49903 • (906) 822-7889

Client: White Pine Copper, LLC **WWA Job #:** 111679

Project: Surface Water

Date Received: 7/24/2024 **Date Reported:** 7/25/2024

Sample Number	Client Sample ID	Date/Time Sampled	Sample Matrix
111679-001	WPM-SWQ-Portal-001A	7/24/2024 12:49	Water
111679-002	WPM-SWQ-Portal-001B	7/24/2024 12:50	Water
111679-003	WPM-SWQ-Portal-001C	7/24/2024 12:54	Water
111679-004	WPM-SWQ-Mineral-001A	7/24/2024 12:22	Water
111679-005	WPM-SWQ-Mineral-001B	7/24/2024 12:24	Water
111679-006	WPM-SWQ-Mineral-001C	7/24/2024 12:25	Water
111679-007	WPM-SWQ-Perch-001A	7/24/2024 12:02	Water
111679-008	WPM-SWQ-Perch-001B	7/24/2024 12:04	Water
111679-009	WPM-SWQ-Perch-001C	7/24/2024 12:05	Water
111679-010	WPM-SWQ-Pine-001A	7/24/2024 11:39	Water
111679-011	WPM-SWQ-Pine-001B	7/24/2024 11:40	Water
111679-012	WPM-SWQ-Pine-001C	7/24/2024 11:41	Water
111679-013	WPM-SWQ-Caribou-001A	7/24/2024 11:18	Water
111679-014	WPM-SWQ-Caribou-001B	7/24/2024 11:20	Water
111679-015	WPM-SWQ-Caribou-001C	7/24/2024 11:21	Water
111679-016	WPM-SWQ-DUP-001B	7/24/2024 12:52	Water

WHITE WATER ASSOCIATES, INC.

Client: White Pine Copper, LLC **WWA Job #:** 111679

Comments (if any):

Key to Laboratory Flags:

*: RPD/RSD exceeds limits.
B: The analyte was found in the associated blank as well as in the sample.
J: The quantitation is an estimated value because the result is less than the sample quantitation limit but greater than the detection limit.
M: A matrix effect was present.
Q: Batch QC data associated with the analysis does not meet the stated objectives
H: Indicates analytical holding time exceedance.

ND = Not Detected, MDL = Method Detection Limit, MQL = Method Quantitation Limit
ppm = mg/L (liquid) or mg/kg (solid), ppb = ug/L (liquid) or ug/kg (solid)
For MI EGLE Coliform, Negative = No Coliform bacteria detected, Positive = Coliform bacteria detected

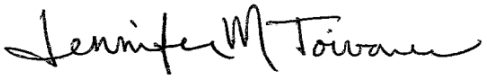
Sample Types:
S = Solids, DW = Drinking water, D = Dissolved, T = Total, TC = TCLP extract, SP = SPLP extract

All samples were received intact and properly preserved unless otherwise noted. The results reported relate only to the samples tested. This report shall not be reproduced, except in full, without the written approval of this laboratory. The Chain of Custody is attached.

This report satisfies the requirements of your project but has not been prepared to comply with NELAP and DoD QSM V5.4 reporting requirements.

I certify that the data contained in this Final Report has been generated and reviewed in accordance with approved methods and White Water Associates Standard Operating Procedures. Exceptions, if any, are discussed in the accompanying sample narrative.

Approved By:
Electronically signed by
Jen Toivonen



WI DNR Lab Certification Number: 999971280
MI EGLE Certification Number: 9306
DoD-ELAP QSM V5.4 Accreditation Number: 65802 by PJLA for Environmental Testing
ISO/IEC 17025:2017 Accredited PJLA 65802

ANALYTICAL REPORT

WHITE WATER ASSOCIATES, INC.
429 River Lane • PO Box 27 Amasa, MI 49903 • (906) 822-7889

Client:	White Pine Copper, LLC	**WWA Job #:**	111679
Project:	Surface Water	**Sample Matrix:**	Water
Date Received:	7/24/2024	**Date Reported:**	7/25/2024

Sample Number | ID | Date/Time Sampled

111679-001 | WPM-SWQ-Portal-001A | 7/24/2024 12:49:00 PM

Test	Result	Flags	Units	Date/Time	Method	Dilution	MDL	MQL	Analyst
General Chemistry Parameters									
E. coli	1600		MPN/100mL	7/24/2024 15:40	9223B	10	10	10	TP

111679-002 | WPM-SWQ-Portal-001B | 7/24/2024 12:50:00 PM

Test	Result	Flags	Units	Date/Time	Method	Dilution	MDL	MQL	Analyst
General Chemistry Parameters									
E. coli	1400		MPN/100mL	7/24/2024 15:40	9223B	10	10	10	TP

111679-003 | WPM-SWQ-Portal-001C | 7/24/2024 12:54:00 PM

Test	Result	Flags	Units	Date/Time	Method	Dilution	MDL	MQL	Analyst
General Chemistry Parameters									
E. coli	1600		MPN/100mL	7/24/2024 15:40	9223B	10	10	10	TP

111679-004 | WPM-SWQ-Mineral-001A | 7/24/2024 12:22:00 PM

Test	Result	Flags	Units	Date/Time	Method	Dilution	MDL	MQL	Analyst
General Chemistry Parameters									
E. coli	31		MPN/100mL	7/24/2024 15:40	9223B	10	10	10	TP

111679-005 | WPM-SWQ-Mineral-001B | 7/24/2024 12:24:00 PM

Test	Result	Flags	Units	Date/Time	Method	Dilution	MDL	MQL	Analyst
General Chemistry Parameters									
E. coli	52		MPN/100mL	7/24/2024 15:40	9223B	10	10	10	TP

111679-006 | WPM-SWQ-Mineral-001C | 7/24/2024 12:25:00 PM

Test	Result	Flags	Units	Date/Time	Method	Dilution	MDL	MQL	Analyst
General Chemistry Parameters									
E. coli	63		MPN/100mL	7/24/2024 15:40	9223B	10	10	10	TP

111679-007 | WPM-SWQ-Perch-001A | 7/24/2024 12:02:00 PM

Test	Result	Flags	Units	Date/Time	Method	Dilution	MDL	MQL	Analyst
General Chemistry Parameters									
E. coli	10		MPN/100mL	7/24/2024 15:40	9223B	10	10	10	TP

WHITE WATER ASSOCIATES, INC.
429 River Lane • PO Box 27 Amasa, MI 49903 • (906) 822-7889

Client:	White Pine Copper, LLC	**WWA Job #:**	111679
Project:	Surface Water	**Sample Matrix:**	Water
Date Received:	7/24/2024	**Date Reported:**	7/25/2024

Sample Number | ID | Date/Time Sampled

111679-008 | WPM-SWQ-Perch-001B | 7/24/2024 12:04:00 PM

Test	Result	Flags	Units	Date/Time	Method	Dilution	MDL	MQL	Analyst
General Chemistry Parameters									
E. coli	31		MPN/100mL	7/24/2024 15:40	9223B	10	10	10	TP

111679-009 | WPM-SWQ-Perch-001C | 7/24/2024 12:05:00 PM

Test	Result	Flags	Units	Date/Time	Method	Dilution	MDL	MQL	Analyst
General Chemistry Parameters									
E. coli	ND		MPN/100mL	7/24/2024 15:40	9223B	10	10	10	TP

111679-010 | WPM-SWQ-Pine-001A | 7/24/2024 11:39:00 AM

Test	Result	Flags	Units	Date/Time	Method	Dilution	MDL	MQL	Analyst
General Chemistry Parameters									
E. coli	180		MPN/100mL	7/24/2024 15:40	9223B	10	10	10	TP

111679-011 | WPM-SWQ-Pine-001B | 7/24/2024 11:40:00 AM

Test	Result	Flags	Units	Date/Time	Method	Dilution	MDL	MQL	Analyst
General Chemistry Parameters									
E. coli	290		MPN/100mL	7/24/2024 15:40	9223B	10	10	10	TP

111679-012 | WPM-SWQ-Pine-001C | 7/24/2024 11:41:00 AM

Test	Result	Flags	Units	Date/Time	Method	Dilution	MDL	MQL	Analyst
General Chemistry Parameters									
E. coli	210		MPN/100mL	7/24/2024 15:40	9223B	10	10	10	TP

111679-013 | WPM-SWQ-Caribou-001A | 7/24/2024 11:18:00 AM

Test	Result	Flags	Units	Date/Time	Method	Dilution	MDL	MQL	Analyst
General Chemistry Parameters									
E. coli	31		MPN/100mL	7/24/2024 15:40	9223B	10	10	10	TP

111679-014 | WPM-SWQ-Caribou-001B | 7/24/2024 11:20:00 AM

Test	Result	Flags	Units	Date/Time	Method	Dilution	MDL	MQL	Analyst
General Chemistry Parameters									
E. coli	63		MPN/100mL	7/24/2024 15:40	9223B	10	10	10	TP

111679-015 | WPM-SWQ-Caribou-001C | 7/24/2024 11:21:00 AM

Test	Result	Flags	Units	Date/Time	Method	Dilution	MDL	MQL	Analyst
General Chemistry Parameters									
E. coli	75		MPN/100mL	7/24/2024 15:40	9223B	10	10	10	TP

WHITE WATER ASSOCIATES, INC.
429 River Lane • PO Box 27 Amasa, MI 49903 • (906) 822-7889

Client:	White Pine Copper, LLC	**WWA Job #:**	111679
Project:	Surface Water	**Sample Matrix:**	Water
Date Received:	7/24/2024	**Date Reported:**	7/25/2024

Sample Number | ID | Date/Time Sampled

111679-016 | WPM-SWQ-DUP-001B | 7/24/2024 12:52:00 PM

Test	Result	Flags	Units	Date/Time	Method	Dilution	MDL	MQL	Analyst
General Chemistry Parameters									
E. coli	1400		MPN/100mL	7/24/2024 15:40	9223B	10	10	10	TP

LOGIN CHECKLIST

WHITE WATER ASSOCIATES, INC.
429 River Lane • PO Box 27 Amasa, MI 49903 • (906) 822-7889

Client: White Pine Copper, LLC
Project: Surface Water
Date Received: 7/24/2024

WWA Job #: 111679
Date Reported: 7/25/2024

Date logged in.: 7/24/2024 **Number of coolers:** 1

Login person's initials: BL **Courier/shipper:** Client

- [x] **01) The COC is signed. (either Sampler or Relinquished by)**
- [ ] **02) Custody seals/original packing tape were intact (if applicable).**
- [x] **03) Samples are in good condition, i.e. not broken or leaking.**
- [x] **04) Samples matched the Chain of Custody (COC).**
- [x] **05) Samples were received within holding times.**
- [x] **06) Samples were received on ice (in direct contact with the samples).** **Comments:**
- [x] **07) Temperature of the samples was between 0-6°C.** **08) Temp.:** 0.7 (Observed) 1 (Corrected)
- [x] **09) Proper containers were used.**
- [x] **10) Samples were collected in White Water lab containers.**
- [x] **11) There is adequate sample volume for requested analyses and QC.**
- [ ] **12) Samples are preserved to the proper pH. Sample bottles and preservation are noted in LIMS Sample Container Section.**
- [ ] **13) Sub-sampling (SS) is required. Bottles created are noted in sample containers section of log-in form.**
- [ ] **14) For Dissolved Analysis (when applicable), samples were filtered in the lab.**
- [ ] **15) For water VOC samples, headspace is less than the size of a pea.**
- [ ] **16) For soil VOCs, methanol preserved samples were received.**
- [ ] **17) For Soil VOCs, samples were preserved with methanol in the lab.**
- [ ] **18) Client contact is necessary. Provide documentation below.**

COMMENTS/CORRECTIVE ACTION

CLIENT RESPONSE

Note: Samples not between 0-6°C that are received at the laboratory on the day of sample collections do not require client notificati

Note: If hold time, volume, and received on ice or temperature criteria are not met when required by the method, results may not be able to be used for regulatory purposes. Check with your reporting agency for more information.

Week 3

Version 231011

Job # (WWA office use): 111679

CHAIN-OF-CUSTODY RECORD

WHITE WATER ASSOCIATES, INC.

Amasa MI: PO Box 27, 429 River Ln, Amasa MI 49903, 906-822-7889
Kewaunee WI: 223B Milwaukee St, Kewaunee WI 54216, 920-388-9067

CLIENT NAME / BILL TO	EMAIL ADDRESS
White Pine Copper	azeidler@whitepinecu.com
ADDRESS	**TELEPHONE**
PO Box 338	906-204-6500

CITY	STATE	ZIP	PROJECT NAME / WSSN#
White Pine	MI	49971	

SAMPLER NAME (print first/last name)	COUNTY OF LOCATION	SITE CODE
Amanda Zeidler	Ontonagon	

SAMPLER'S SIGNATURE: Amanda Zeidler

Public Water Suppliers
CIRCLE Sample Type Below
Routine, Repeat, Raw, Process, or Other

TEST / ANALYSIS REQUESTED (Attach list if needed)

Unless otherwise noted, drinking water reports are sent to the local and/or state regulating agencies

WWA Samp #	SAMPLE ID AND LOCATION (Containers for each sample may be combined on one line)	Sample Collection DATE	Sample Collection TIME	Matrix Code (key below)	(G)rab (C)omp	Filtered	Residual Chlorine	PRESERVATIVES* None	H2SO4	HNO3	HCl	NaOH	Na Thio	G-Trizma	Other:	Number of Containers	E coli	REMARKS (Note any special instructions provided by client or conditions of receipt noted by WWA lab staff.)
1	WPM-SWQ-Portal-001A	7-24-24	12:49	W	G								✓			1	✓	Surface Water
2	WPM-SWQ-Portal-001B		12:50										✓			1	✓	
3	WPM-SWQ-Portal-001C		12:54										✓			1	✓	
4	WPM-SWQ-Mineral-001A		12:22										✓			1	✓	
5	WPM-SWQ-Mineral-001B		12:24										✓			1	✓	
6	WPM-SWQ-Mineral-001C		12:25										✓			1	✓	
7	WPM-SWQ-Perch-001A		12:02										✓			1	✓	
8	WPM-SWQ-Perch-001B		12:04										✓			1	✓	
9	WPM-SWQ-Perch-001C		12:05										✓			1	✓	
10	WPM-SWQ-Pine-001A		11:39										✓			1	✓	
11	WPM-SWQ-Pine-001B		11:40										✓			1	✓	
12	WPM-SWQ-Pine-001C		11:41										✓			1	✓	

Relinquished by:	Date:	Time:	Received by:	Date:	Time:
Amanda Zeidler	7-24-24	14:39	Brian LaChapelle	7/24/24	14:39
Relinquished by:	Date:	Time:	Received by:	Date:	Time:

Comments:

Packing: Ice ✓ Cooler

Matrix Code: Drinking Water (**DW**), Water (**W**), Sediment (**Sd**), Soil/Solid (**S**), TCLP (**TC**), SPLP (**SP**), Other (**O**)

Sample temp (°C) on receipt: obs: 0.7 corr: 1

Note: Drinking Water records retained for a minimum of 12 years unless directed by client for regulatory agency *Preservative noted upon arrival, see LIMS for bottle preservation details.

UPS☐ FedEx☐ USPS☐ Client☒ Other _____

Version 230419

Job # (WWA office use): 111079

CHAIN-OF-CUSTODY RECORD

WHITE WATER ASSOCIATES, INC.

Amasa MI: PO Box 27, 429 River Ln, Amasa MI 49903, 906-822-7889
Kewaunee WI: 223B Milwaukee St, Kewaunee WI 54216, 920-419-2249

CLIENT NAME / BILL TO	EMAIL ADDRESS
White Pine Copper	azeidler@whitepinecu.com
ADDRESS	**TELEPHONE**
PO Box 338	906-204-6500
CITY / **STATE** / **ZIP**	**PROJECT NAME / WSSN#**
White Pine / MI / 49971	
SAMPLER NAME (print first/last name)	**COUNTY OF LOCATION** / **SITE CODE**
Amanda Zeidler	
SAMPLER'S SIGNATURE	**Public Systems, In REMARKS state:** Sample Type = Routine, Repeat, Raw, Process, or Other. / **Preservatives** WWA noted upon arrival, database contains bottle preservation details.

TEST / ANALYSIS REQUESTED (Attach list if needed)

Unless otherwise noted, drinking water reports are sent to the local and/or state regulating agencies

	SAMPLE ID AND LOCATION (Containers for each sample may be combined on one line)	Sample Collection DATE	Sample Collection TIME	Matrix Code (key below)	Samp Type (G)rab (C)omp	Filtered	Residual Chlorine	PRESERVATIVES None	H2SO4	HNO3	HCl	NaOH	Na Thio	G-Trizma	Other:	Number of Containers	E coli	REMARKS (Note any special instructions provided by client or conditions of receipt noted by WWA lab staff.)
13	WPM-SWQ-Caribou-001A	7-24-24	11:18	W	G								✓			1	✓	Surface water
14	WPM-SWQ-Caribou-001B		11:20										✓			1	✓	
15	WPM-SWQ-Caribou-001C		11:21										✓			1	✓	
16	WPM-SWQ-Dup-001B		12:52										✓			1	✓	

Relinquished by:	Date:	Time:	Received by:	Date:	Time:
	7-24-24	14:39		7.24.24	14:39
Relinquished by:	Date:	Time:	Received by:	Date:	Time:

Comments:

Packing: Ice ✓ Cooler

Matrix Code: Drinking Water (**DW**), Water (**W**), Sediment (**Sd**), Soil/Solid (**S**), TCLP (**TC**), SPLP (**SP**), Other (**O**)

Note: Drinking Water records retained for a minimum of 12 years unless directed by client for regulatory agency

Sample temp (°C) on receipt: obs: 0.7 corr: 1

UPS☐ FedEx☐ USPS☐ Client☒ Other _____

COVER PAGE

WHITE WATER ASSOCIATES, INC.
429 River Lane • PO Box 27 Amasa, MI 49903 • (906) 822-7889

Client: White Pine Copper, LLC **WWA Job #:** 112027

Project:

Date Received: 8/14/2024 **Date Reported:** 9/17/2024

Sample Number	Client Sample ID	Date/Time Sampled	Sample Matrix
112027-001	WPM-SWQ-Portal-001	8/14/2024 10:38	Water
112027-002	WPM-SWQ-Mineral-001	8/14/2024 10:14	Water
112027-003	WPM-SWQ-Perch-001	8/14/2024 9:55	Water
112027-004	WPM-SWQ-Pine-001	8/14/2024 11:40	Water
112027-005	WPM-SWQ-Caribou-001	8/14/2024 11:23	Water
112027-006	WPM-SWQ-Dup-001	8/14/2024 11:42	Water

Comments (if any):

Key to Laboratory Flags:

*: RPD/RSD exceeds limits.
B: The analyte was found in the associated blank as well as in the sample.
J: The quantitation is an estimated value because the result is less than the sample quantitation limit but greater than the detection limit.
M: A matrix effect was present.
Q: Batch QC data associated with the analysis does not meet the stated objectives
H: Indicates analytical holding time exceedance.

ND = Not Detected, MDL = Method Detection Limit, MQL = Method Quantitation Limit
ppm = mg/L (liquid) or mg/kg (solid), ppb = ug/L (liquid) or ug/kg (solid)
For MI EGLE Coliform, Negative = No Coliform bacteria detected, Positive = Coliform bacteria detected

Sample Types:
S = Solids, DW = Drinking water, D = Dissolved, T = Total, TC = TCLP extract, SP = SPLP extract

All samples were received intact and properly preserved unless otherwise noted. The results reported relate only to the samples tested. This report shall not be reproduced, except in full, without the written approval of this laboratory. The Chain of Custody is attached.

This report satisfies the requirements of your project but has not been prepared to comply with NELAP and DoD QSM V5.4 reporting requirements.

I certify that the data contained in this Final Report has been generated and reviewed in accordance with approved methods and White Water Associates Standard Operating Procedures. Exceptions, if any, are discussed in the accompanying sample narrative.

Approved By:
Electronically signed by
Jen Toivonen

Jennifer M Toivonen

WI DNR Lab Certification Number: 999971280
MI EGLE Certification Number: 9306
DoD-ELAP QSM V5.4 Accreditation Number: 65802 by PJLA for Environmental Testing
ISO/IEC 17025:2017 Accredited PJLA 65802

ANALYTICAL REPORT

WHITE WATER ASSOCIATES, INC.
429 River Lane • PO Box 27 Amasa, MI 49903 • (906) 822-7889

Client: White Pine Copper, LLC **WWA Job #:** 112027

Project:

Date Received: 8/14/2024 **Date Reported:** 9/17/2024

Sample Results

Sample No. / ID / Description / Matrix	Result	Flags	Units	Date/Time	Method	Dilution	MDL	MQL	Analyst
112027-001 / WPM-SWQ-Portal-001 / Water									
General Chemistry Parameters									
Total Phosphorus LL (t)	ND		mg/L	9/10/2024 20:29	4500 P E	1	0.0050	0.010	OL
112027-002 / WPM-SWQ-Mineral-001 / Water									
General Chemistry Parameters									
Total Phosphorus LL (t)	ND		mg/L	9/10/2024 20:29	4500 P E	1	0.0050	0.010	OL
112027-003 / WPM-SWQ-Perch-001 / Water									
General Chemistry Parameters									
Total Phosphorus LL (t)	ND		mg/L	9/10/2024 20:29	4500 P E	1	0.0050	0.010	OL
112027-004 / WPM-SWQ-Pine-001 / Water									
General Chemistry Parameters									
Total Phosphorus LL (t)	ND		mg/L	9/10/2024 20:29	4500 P E	1	0.0050	0.010	OL
112027-005 / WPM-SWQ-Caribou-001 / Water									
General Chemistry Parameters									
Total Phosphorus LL (t)	0.0091	J	mg/L	9/10/2024 20:29	4500 P E	1	0.0050	0.010	OL
112027-006 / WPM-SWQ-Dup-001 / Water									
General Chemistry Parameters									
Total Phosphorus LL (t)	ND		mg/L	9/10/2024 20:29	4500 P E	1	0.0050	0.010	OL

ND = Not Detected, MDL = Method Detection Limit, MQL = Method Quantitation Limit, ppm = mg/L (liquid) or mg/kg (solid), ppb = ug/L (liquid) or ug/kg (solid)

LOGIN CHECKLIST

WHITE WATER ASSOCIATES, INC.
429 River Lane • PO Box 27 Amasa, MI 49903 • (906) 822-7889

Client: White Pine Copper, LLC
Project:
Date Received: 8/14/2024

WWA Job #: 112027
Date Reported: 9/17/2024

Date logged in.: 8/14/2024 **Number of coolers:** 1

Login person's initials: BL **Courier/shipper:** Client

- [x] **01) The COC is signed. (either Sampler or Relinquished by)**
- [x] **02) Custody seals/original packing tape were intact (if applicable).**
- [x] **03) Samples are in good condition, i.e. not broken or leaking.**
- [x] **04) Samples matched the Chain of Custody (COC).**
- [x] **05) Samples were received within holding times.**
- [x] **06) Samples were received on ice (in direct contact with the samples).** **Comments:**
- [x] **07) Temperature of the samples was between 0-6°C.** **08) Temp.:** 1.5 (Observed) 2 (Corrected)
- [x] **09) Proper containers were used.**
- [x] **10) Samples were collected in White Water lab containers.**
- [x] **11) There is adequate sample volume for requested analyses and QC.**
- [ ] **12) Samples are preserved to the proper pH. Sample bottles and preservation are noted in LIMS Sample Container Section.**
- [ ] **13) Sub-sampling (SS) is required. Bottles created are noted in sample containers section of log-in form.**
- [ ] **14) For Dissolved Analysis (when applicable), samples were filtered in the lab.**
- [ ] **15) For water VOC samples, headspace is less than the size of a pea.**
- [ ] **16) For soil VOCs, methanol preserved samples were received.**
- [ ] **17) For Soil VOCs, samples were preserved with methanol in the lab.**
- [ ] **18) Client contact is necessary. Provide documentation below.**

COMMENTS/CORRECTIVE ACTION

CLIENT RESPONSE

Note: Samples not between 0-6°C that are received at the laboratory on the day of sample collections do not require client notificati

Note: If hold time, volume, and received on ice or temperature criteria are not met when required by the method, results may not be able to be used for regulatory purposes. Check with your reporting agency for more information.

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Version 230419

Job # (WWA office use): 112027 **CHAIN-OF-CUSTODY RECORD**

Page: 1 OF 1

WHITE WATER ASSOCIATES, INC.

Amasa MI: PO Box 27, 429 River Ln, Amasa MI 49903, 906-822-7889
Kewaunee WI: 223B Milwaukee St, Kewaunee WI 54216, 920-419-2249

CLIENT NAME / BILL TO	EMAIL ADDRESS
White Pine Copper	azeidler@whitepinecu.com
ADDRESS	**TELEPHONE**
PO Box 338	906-204-6500

CITY	STATE	ZIP	PROJECT NAME / WSSN#
White Pine	MI	49971	

SAMPLER NAME (print first/last name)	COUNTY OF LOCATION	SITE CODE
Amanda Zeidler	Ontonagon	

SAMPLER'S SIGNATURE: Amanda Zeidler

Public Systems, In REMARKS state: Sample Type = Routine, Repeat, Raw, Process, or Other.

Preservatives WWA noted upon arrival, database contains bottle preservation details.

TEST / ANALYSIS REQUESTED (Attach list if needed)

Unless otherwise noted, drinking water reports are sent to the local and/or state regulating agencies

	SAMPLE ID AND LOCATION (Containers for each sample may be combined on one line)	Sample Collection DATE	Sample Collection TIME	Matrix Code (key below)	Samp Type (G)rab (C)omp	Filtered	Residual Chlorine	PRESERVATIVES None	H2SO4	HNO3	HCl	NaOH	Na Thio	G-Trizma	Other:	Number of Containers	Low-Level Total Phosphorus	REMARKS (Note any special instructions provided by client or conditions of receipt noted by WWA lab staff.)
1	WPM-SWQ-Portal-001	8/14/24	10:38	W				✓								1	✓	Surface Water
2	WPM-SWQ-Mineral-001	↓	10:14	W				✓								1	✓	↓
3	WPM-SWQ-Perch-001		09:55	W				✓								1	✓	
4	WPM-SWQ-Pine-001		11:40	W				✓								1	✓	
5	WPM-SWQ-Caribou-001		11:23	W				✓								1	✓	
6	WPM-SWQ-DUP-001	↓	11:42	W				✓								1	✓	

Relinquished by:	Date:	Time:	Received by:	Date:	Time:
Amanda Zeidler	8/14/24				
Relinquished by:	Date:	Time:	Received by:	Date:	Time:
			Sally Hallbom	8-14-24	15:58

Comments: Packing: Ice ✓ Cooler ✓

Sample temp (°C) on receipt: obs: 0.4 corr: 1.5 2

Matrix Code: Drinking Water (**DW**), Water (**W**), Sediment (**Sd**), Soil/Solid (**S**), TCLP (**TC**), SPLP (**SP**), Other (**O**)

Note: Drinking Water records retained for a minimum of 12 years unless directed by client for regulatory agency

UPS☐ FedEx☐ USPS☐ Client☒ Other _____

COVER PAGE

WHITE WATER ASSOCIATES, INC.
429 River Lane • PO Box 27 Amasa, MI 49903 • (906) 822-7889

Client: White Pine Copper, LLC **WWA Job #:** 112270

Project: Low Level Total Phosphorus

Date Received: 9/4/2024 **Date Reported:** 9/23/2024

Sample Number	Client Sample ID	Date/Time Sampled	Sample Matrix
112270-001	WPM-SWQ-Portal-001	9/3/2024 14:33	Water
112270-002	WPM-SWQ-Mineral-001	9/3/2024 14:12	Water
112270-003	WPM-SWQ-Perch-001	9/3/2024 14:00	Water
112270-004	WPM-SWQ-Pine-001	9/3/2024 13:33	Water
112270-005	WPM-SWQ-Caribou-001	9/3/2024 13:15	Water
112270-006	WPM-SWQ-Dup-001	9/3/2024 13:29	Water

Comments (if any):

Key to Laboratory Flags:

*: RPD/RSD exceeds limits.
B: The analyte was found in the associated blank as well as in the sample.
J: The quantitation is an estimated value because the result is less than the sample quantitation limit but greater than the detection limit.
M: A matrix effect was present.
Q: Batch QC data associated with the analysis does not meet the stated objectives
H: Indicates analytical holding time exceedance.

ND = Not Detected, MDL = Method Detection Limit, MQL = Method Quantitation Limit
ppm = mg/L (liquid) or mg/kg (solid), ppb = ug/L (liquid) or ug/kg (solid)
For MI EGLE Coliform, Negative = No Coliform bacteria detected, Positive = Coliform bacteria detected

Sample Types:
S = Solids, DW = Drinking water, D = Dissolved, T = Total, TC = TCLP extract, SP = SPLP extract

All samples were received intact and properly preserved unless otherwise noted. The results reported relate only to the samples tested. This report shall not be reproduced, except in full, without the written approval of this laboratory. The Chain of Custody is attached.

This report satisfies the requirements of your project but has not been prepared to comply with NELAP and DoD QSM V5.4 reporting requirements.

I certify that the data contained in this Final Report has been generated and reviewed in accordance with approved methods and White Water Associates Standard Operating Procedures. Exceptions, if any, are discussed in the accompanying sample narrative.

Approved By:
Electronically signed by
Jen Toivonen

Jennifer M Toivonen

WI DNR Lab Certification Number: 999971280
MI EGLE Certification Number: 9306
DoD-ELAP QSM V5.4 Accreditation Number: 65802 by PJLA for Environmental Testing
ISO/IEC 17025:2017 Accredited PJLA 65802

ANALYTICAL REPORT

WHITE WATER ASSOCIATES, INC.
429 River Lane • PO Box 27 Amasa, MI 49903 • (906) 822-7889

Client: White Pine Copper, LLC **WWA Job #:** 112270

Project: Low Level Total Phosphorus

Date Received: 9/4/2024 **Date Reported:** 9/23/2024

Sample Results

Sample No. / ID / Description / Matrix	Result	Flags	Units	Date/Time	Method	Dilution	MDL	MQL	Analyst
112270-001 / WPM-SWQ-Portal-001 / Water									
General Chemistry Parameters									
Total Phosphorus LL (t)	ND		mg/L	9/16/2024 21:00	SM 4500 P E	1	0.0050	0.010	EFB
112270-002 / WPM-SWQ-Mineral-001 / Water									
General Chemistry Parameters									
Total Phosphorus LL (t)	ND		mg/L	9/16/2024 21:00	SM 4500 P E	1	0.0050	0.010	EFB
112270-003 / WPM-SWQ-Perch-001 / Water									
General Chemistry Parameters									
Total Phosphorus LL (t)	ND		mg/L	9/16/2024 21:00	SM 4500 P E	1	0.0050	0.010	EFB
112270-004 / WPM-SWQ-Pine-001 / Water									
General Chemistry Parameters									
Total Phosphorus LL (t)	ND		mg/L	9/16/2024 21:00	SM 4500 P E	1	0.0050	0.010	EFB
112270-005 / WPM-SWQ-Caribou-001 / Water									
General Chemistry Parameters									
Total Phosphorus LL (t)	0.034		mg/L	9/16/2024 21:00	SM 4500 P E	1	0.0050	0.010	EFB
112270-006 / WPM-SWQ-Dup-001 / Water									
General Chemistry Parameters									
Total Phosphorus LL (t)	ND		mg/L	9/16/2024 21:00	SM 4500 P E	1	0.0050	0.010	EFB

ND = Not Detected, MDL = Method Detection Limit, MQL = Method Quantitation Limit, ppm = mg/L (liquid) or mg/kg (solid), ppb = ug/L (liquid) or ug/kg (solid)

LOGIN CHECKLIST

WHITE WATER ASSOCIATES, INC.
429 River Lane • PO Box 27 Amasa, MI 49903 • (906) 822-7889

Client:	White Pine Copper, LLC	**WWA Job #:**	112270
Project:	Low Level Total Phosphorus	**Date Reported:**	9/23/2024
Date Received:	9/4/2024		

Date logged in.: 9/4/2024 **Number of coolers:** 1

Login person's initials: BL **Courier/shipper:** Client

- [x] **01) The COC is signed. (either Sampler or Relinquished by)**
- [x] **02) Custody seals/original packing tape were intact (if applicable).**
- [x] **03) Samples are in good condition, i.e. not broken or leaking.**
- [x] **04) Samples matched the Chain of Custody (COC).**
- [x] **05) Samples were received within holding times.**
- [x] **06) Samples were received on ice (in direct contact with the samples).** **Comments:**
- [x] **07) Temperature of the samples was between 0-6°C.** **08) Temp.:** 0.1 (Observed) 0 (Corrected)
- [x] **09) Proper containers were used.**
- [x] **10) Samples were collected in White Water lab containers.**
- [x] **11) There is adequate sample volume for requested analyses and QC.**
- [ ] **12) Samples are preserved to the proper pH. Sample bottles and preservation are noted in LIMS Sample Container Section.**
- [ ] **13) Sub-sampling (SS) is required. Bottles created are noted in sample containers section of log-in form.**
- [ ] **14) For Dissolved Analysis (when applicable), samples were filtered in the lab.**
- [ ] **15) For water VOC samples, headspace is less than the size of a pea.**
- [ ] **16) For soil VOCs, methanol preserved samples were received.**
- [ ] **17) For Soil VOCs, samples were preserved with methanol in the lab.**
- [ ] **18) Client contact is necessary. Provide documentation below.**

COMMENTS/CORRECTIVE ACTION

CLIENT RESPONSE

Note: Samples not between 0-6°C that are received at the laboratory on the day of sample collections do not require client notificati

Note: If hold time, volume, and received on ice or temperature criteria are not met when required by the method, results may not be able to be used for regulatory purposes. Check with your reporting agency for more information.

Version 230419

Job # (WWA office use): 112270

CHAIN-OF-CUSTODY RECORD

WHITE WATER ASSOCIATES, INC.

Page: 1 OF 1

Amasa MI: PO Box 27, 429 River Ln, Amasa MI 49903, 906-822-7889
Kewaunee WI: 223B Milwaukee St, Kewaunee WI 54216, 920-419-2249

CLIENT NAME / BILL TO	EMAIL ADDRESS
White Pine Copper	azeidler@whitepinecu.com
ADDRESS	**TELEPHONE**
PO Box 338	906-204-6500

CITY	STATE	ZIP	PROJECT NAME / WSSN#
White Pine	MI	49971	

SAMPLER NAME (print first/last name)	COUNTY OF LOCATION	SITE CODE
Amanda Zeidler	Ontonagon	

SAMPLER'S SIGNATURE: Amanda Zeidler

Public Systems, In REMARKS state: Sample Type = Routine, Repeat, Raw, Process, or Other.

Preservatives WWA noted upon arrival, database contains bottle preservation details.

TEST / ANALYSIS REQUESTED (Attach list if needed)

Unless otherwise noted, drinking water reports are sent to the local and/or state regulating agencies

	SAMPLE ID AND LOCATION (Containers for each sample may be combined on one line)	Sample Collection DATE	Sample Collection TIME	Matrix Code (key below)	Samp Type (G)rab (C)omp	Filtered	Residual Chlorine	PRESERVATIVES None	H2SO4	HNO3	HCl	NaOH	Na Thio	G-Trizma	Other:	Number of Containers	Low-Level Total Phosphorus									REMARKS (Note any special instructions provided by client or conditions of receipt noted by WWA lab staff.)
1	WPM-SWQ-Portal-001	9/3/24	14:33	W				✓								1	✓									Surface Water
2	WPM-SWQ-Mineral-001		14:12	W				✓								1	✓									
3	WPM-SWQ-Perch-001		14:00	W				✓								1	✓									
4	WPM-SWQ-Pine-001		13:33	W				✓								1	✓									
5	WPM-SWQ-Caribou-001		13:15	W				✓								1	✓									
6	WPM-SWQ-Dup-001	↓	13:29	W				✓								1	✓									

Relinquished by:	Date:	Time:	Received by:	Date:	Time:
	9/3/24	17:45		9.4.24	8:21
Relinquished by:	Date:	Time:	Received by:	Date:	Time:

Comments:

Packing: Ice ✓ Cooler

Matrix Code: Drinking Water (**DW**), Water (**W**), Sediment (**Sd**), Soil/Solid (**S**), TCLP (**TC**), SPLP (**SP**), Other (**O**)

Note: Drinking Water records retained for a minimum of 12 years unless directed by client for regulatory agency

Sample temp (°C) on receipt: obs: 0.1 corr: 0

UPS☐ FedEx☐ USPS☐ Client☒ Other _____

Appendix D

Michigan Stream Quantification Tool
Results by Reach

Site Information and Reference Standard Stratification	
Project Name:	White Pine
Reach ID:	1a
Restoration Potential:	NA
Existing Stream Length (ft):	73
Proposed Stream Length (ft):	
Existing Stream Type:	E
Proposed/ Reference Stream Type:	E
Valley Type:	Unconfined Alluvial
Drainage Area (sq. mi.):	
Strahler Stream Order:	First
Flow Type:	Perennial
Ecoregion:	Northern Lakes and Forests
Bed Material:	Gravel
Stream Slope (%):	1.8
Stream Temperature:	Warm
Wadeable/Non-wadeable:	Wadeable
Reference Vegetation Community:	Forested

Notes
1. Users input values that are highlighted based on restoration potential
2. Users select values from a pull-down menu
3. Leave values blank for field values that were not measured and/or autopopulate

FUNCTIONAL CHANGE SUMMARY	
Existing Condition Score (ECS)	0.68
Proposed Condition Score (PCS)	
Change in Functional Condition (PCS - ECS)	
Percent Condition Change	
Existing Stream Length (ft)	73
Proposed Stream Length (ft)	
Additional Stream Length (ft)	
Existing Functional Foot Score (FFS)	50
Proposed Functional Foot Score (FFS)	
Proposed FFS - Existing FFS (ΔFF)	
Yield (ΔFF/Proposed LF)	

BMP FUNCTIONAL CHANGE SUMMARY	
Existing BMP Functional Feet Score (FFS)	0
Proposed BMP Functional Feet Score (FFS)	0
Proposed BMP FFS - Existing BMP FFS	0

FUNCTIONAL FEET (FF) SUMMARY	
Existing Stream FFS + Existing BMP FFS	50
Proposed Stream FFS + Proposed BMP FFS	
Total Proposed FFS - Total Existing FFS	
Yield (ΔFF/Proposed LF)	

FUNCTION-BASED PARAMETER SUMMARY			
Functional Category	**Function-Based Parameters**	**Existing Parameter**	**Proposed Parameter**
Hydrology	Reach Runoff	1.00	
Hydraulics	Floodplain Connectivity	0.91	
Geomorphology	Large Woody Debris	0.00	
	Lateral Migration	1.00	
	Riparian Vegetation	0.72	
	Bed Form Diversity	0.89	
Physicochemical	Temperature	1.00	
	Bacteria	0.81	
	Nutrients	0.68	
	Dissolved Oxygen	0.00	
Biology	Macroinvertebrates	0.23	
	Fish	0.25	

FUNCTIONAL CATEGORY REPORT CARD			
Functional Category	**ECS**	**PCS**	**Functional Change**
Hydrology	1.00		
Hydraulics	0.91		
Geomorphology	0.65		
Physicochemical	0.62		
Biology	0.24		

MiSQT v1
Quantification Tool

Reach ID:1a

EXISTING CONDITION ASSESSMENT					Roll Up Scoring			
Functional Category	**Function-Based Parameters**	**Metric**	**Field Value**	**Index Value**	**Parameter**	**Category**	**Category**	**Overall**
Hydrology	Reach Runoff	Land Use Change Coefficient	30	1.00	1.00	1.00	Functioning	0.68
		Concentrated Flow Points (#/1000 LF)	0	1.00				
Hydraulics	Floodplain Connectivity	Bank Height Ratio	0.62	1.00	0.91	0.91	Functioning	
		Entrenchment Ratio	3.41	0.82				
Geomorphology	Large Woody Debris	LWD Index	0	0.00	0.00	0.65	Functioning At Risk	
	Lateral Migration	Dominant BEHI/NBS	L/L	1.00	1.00			
		Percent Streambank Erosion (%)	0	1.00				
		Percent Streambank Armoring (%)	0	1.00				
	Riparian Vegetation	Buffer Width (ft)	53	0.54	0.72			
		Average DBH (Inches)	4.1	0.34				
		Tree Density (#/Ac)	184.9	1.00				
		Native Shrub/Sapling Density (#/Ac)	1926	1.00				
		Native Herbaceous Cover (%)	65	FALSE				
	Bed Form Diversity	Pool Spacing Ratio	2.36	0.54	0.89			
		Pool Depth Ratio	18.81	1.00				
		Percent Riffle (%)	64.4	1.00				
		Aggradation Ratio	0.58	1.00				
Physicochemical	Temperature	July Mean Temperature (°F)	68.6	1.00	1.00	0.62	Functioning At Risk	
	Bacteria	E. Coli (cfu/100 ml)	183.55	0.81	0.81			
	Nutrients	Total Phosphorus (mcg/L)	14	0.68	0.68			
	Dissolved Oxygen	DO Concentration (mg/L)	2.41	0.00	0.00			
Biology	Macroinvertebrates	Macroinvertebrate P51 Index Score	-5	0.23	0.23	0.24	Not Functioning	
		Macroinvertebrate P22 Index Score						
	Fish	Fish P51 Index Score	-5	0.25	0.25			

Site Information and Reference Standard Stratification	
Project Name:	White Pine
Reach ID:	1b
Restoration Potential:	NA
Existing Stream Length (ft):	200
Proposed Stream Length (ft):	
Existing Stream Type:	G
Proposed/ Reference Stream Type:	E
Valley Type:	Confined Alluvial
Drainage Area (sq. mi.):	
Strahler Stream Order:	First
Flow Type:	Perennial
Ecoregion:	Northern Lakes and Forests
Bed Material:	Silt/Clay
Stream Slope (%):	1.3
Stream Temperature:	Warm
Wadeable/Non-wadeable:	Wadeable
Reference Vegetation Community:	Forested

Notes
1. Users input values that are highlighted based on restoration potential
2. Users select values from a pull-down menu
3. Leave values blank for field values that were not measured and/or autopopulate

FUNCTIONAL CHANGE SUMMARY	
Existing Condition Score (ECS)	0.48
Proposed Condition Score (PCS)	
Change in Functional Condition (PCS - ECS)	
Percent Condition Change	
Existing Stream Length (ft)	200
Proposed Stream Length (ft)	
Additional Stream Length (ft)	
Existing Functional Foot Score (FFS)	96
Proposed Functional Foot Score (FFS)	
Proposed FFS - Existing FFS (ΔFF)	
Yield (ΔFF/Proposed LF)	

BMP FUNCTIONAL CHANGE SUMMARY	
Existing BMP Functional Feet Score (FFS)	0
Proposed BMP Functional Feet Score (FFS)	0
Proposed BMP FFS - Existing BMP FFS	0

FUNCTIONAL FEET (FF) SUMMARY	
Existing Stream FFS + Existing BMP FFS	96
Proposed Stream FFS + Proposed BMP FFS	
Total Proposed FFS - Total Existing FFS	
Yield (ΔFF/Proposed LF)	

FUNCTION-BASED PARAMETER SUMMARY			
Functional Category	**Function-Based Parameters**	**Existing Parameter**	**Proposed Parameter**
Hydrology	Reach Runoff	1.00	
Hydraulics	Floodplain Connectivity	0.00	
Geomorphology	Large Woody Debris	0.02	
	Lateral Migration	0.62	
	Riparian Vegetation	0.77	
	Bed Form Diversity	0.82	
Physicochemical	Temperature	1.00	
	Bacteria	0.81	
	Nutrients	0.68	
	Dissolved Oxygen	0.00	
Biology	Macroinvertebrates	0.23	
	Fish	0.25	

FUNCTIONAL CATEGORY REPORT CARD			
Functional Category	**ECS**	**PCS**	**Functional Change**
Hydrology	1.00		
Hydraulics	0.00		
Geomorphology	0.56		
Physicochemical	0.62		
Biology	0.24		

Reach ID:1b

EXISTING CONDITION ASSESSMENT					Roll Up Scoring			
Functional Category	**Function-Based Parameters**	**Metric**	**Field Value**	**Index Value**	**Parameter**	**Category**	**Category**	**Overall**
Hydrology	Reach Runoff	Land Use Change Coefficient	30	1.00	1.00	1.00	Functioning	0.48
		Concentrated Flow Points (#/1000 LF)	0	1.00				
Hydraulics	Floodplain Connectivity	Bank Height Ratio	6.58	0.00	0.00	0.00	Not Functioning	
		Entrenchment Ratio	1.24	0.00				
Geomorphology	Large Woody Debris	LWD Index	30	0.02	0.02	0.56	Functioning At Risk	
	Lateral Migration	Dominant BEHI/NBS	VH/L	0.40	0.62			
		Percent Streambank Erosion (%)	32	0.46				
		Percent Streambank Armoring (%)	0	1.00				
	Riparian Vegetation	Buffer Width (ft)	168	1.00	0.77			
		Average DBH (Inches)	7.1	0.59				
		Tree Density (#/Ac)	323.6	0.50				
		Native Shrub/Sapling Density (#/Ac)	708.8	1.00				
		Native Herbaceous Cover (%)	35	FALSE				
	Bed Form Diversity	Pool Spacing Ratio	4.88	1.00	0.82			
		Pool Depth Ratio	1.95	0.66				
		Percent Riffle (%)	35	0.60				
		Aggradation Ratio	0.87	1.00				
Physicochemical	Temperature	July Mean Temperature (°F)	68.6	1.00	1.00	0.62	Functioning At Risk	
	Bacteria	E. Coli (cfu/100 ml)	183.55	0.81	0.81			
	Nutrients	Total Phosphorus (mcg/L)	14	0.68	0.68			
	Dissolved Oxygen	DO Concentration (mg/L)	2.41	0.00	0.00			
Biology	Macroinvertebrates	Macroinvertebrate P51 Index Score	-5	0.23	0.23	0.24	Not Functioning	
		Macroinvertebrate P22 Index Score						
	Fish	Fish P51 Index Score	-5	0.25	0.25			

Site Information and Reference Standard Stratification	
Project Name:	White Pine
Reach ID:	2a
Restoration Potential:	NA
Existing Stream Length (ft):	422
Proposed Stream Length (ft):	
Existing Stream Type:	C
Proposed/ Reference Stream Type:	C
Valley Type:	Confined Alluvial
Drainage Area (sq. mi.):	
Strahler Stream Order:	First
Flow Type:	Perennial
Ecoregion:	Northern Lakes and Forests
Bed Material:	Silt/Clay
Stream Slope (%):	Impounded
Stream Temperature:	Warm
Wadeable/Non-wadeable:	Wadeable
Reference Vegetation Community:	Forested

Notes
1. Users input values that are highlighted based on restoration potential
2. Users select values from a pull-down menu
3. Leave values blank for field values that were not measured and/or autopopulate

FUNCTIONAL CHANGE SUMMARY	
Existing Condition Score (ECS)	0.45
Proposed Condition Score (PCS)	
Change in Functional Condition (PCS - ECS)	
Percent Condition Change	
Existing Stream Length (ft)	422
Proposed Stream Length (ft)	
Additional Stream Length (ft)	
Existing Functional Foot Score (FFS)	190
Proposed Functional Foot Score (FFS)	
Proposed FFS - Existing FFS (ΔFF)	
Yield (ΔFF/Proposed LF)	

BMP FUNCTIONAL CHANGE SUMMARY	
Existing BMP Functional Feet Score (FFS)	0
Proposed BMP Functional Feet Score (FFS)	0
Proposed BMP FFS - Existing BMP FFS	0

FUNCTIONAL FEET (FF) SUMMARY	
Existing Stream FFS + Existing BMP FFS	190
Proposed Stream FFS + Proposed BMP FFS	
Total Proposed FFS - Total Existing FFS	
Yield (ΔFF/Proposed LF)	

FUNCTION-BASED PARAMETER SUMMARY			
Functional Category	**Function-Based Parameters**	**Existing Parameter**	**Proposed Parameter**
Hydrology	Reach Runoff	1.00	
Hydraulics	Floodplain Connectivity	0.00	
Geomorphology	Large Woody Debris	0.07	
	Lateral Migration	0.73	
	Riparian Vegetation	0.83	
	Bed Form Diversity	0.00	
Physicochemical	Temperature	1.00	
	Bacteria	0.81	
	Nutrients	0.68	
	Dissolved Oxygen	0.00	
Biology	Macroinvertebrates	0.23	
	Fish	0.25	

FUNCTIONAL CATEGORY REPORT CARD			
Functional Category	**ECS**	**PCS**	**Functional Change**
Hydrology	1.00		
Hydraulics	0.00		
Geomorphology	0.41		
Physicochemical	0.62		
Biology	0.24		

Reach ID:2a

EXISTING CONDITION ASSESSMENT					Roll Up Scoring			
Functional Category	**Function-Based Parameters**	**Metric**	**Field Value**	**Index Value**	**Parameter**	**Category**	**Category**	**Overall**
Hydrology	Reach Runoff	Land Use Change Coefficient	30	1.00	1.00	1.00	Functioning	0.45
		Concentrated Flow Points (#/1000 LF)	0	1.00				
Hydraulics	Floodplain Connectivity	Bank Height Ratio	10	0.00	0.00	0.00	Not Functioning	
		Entrenchment Ratio	0	0.00				
Geomorphology	Large Woody Debris	LWD Index	139	0.07	0.07	0.41	Functioning At Risk	
	Lateral Migration	Dominant BEHI/NBS	M/L	0.60	0.73			
		Percent Streambank Erosion (%)	20	0.59				
		Percent Streambank Armoring (%)	0	1.00				
	Riparian Vegetation	Buffer Width (ft)	180	1.00	0.83			
		Average DBH (Inches)	3.7	0.31				
		Tree Density (#/Ac)	154.1	1.00				
		Native Shrub/Sapling Density (#/Ac)	708.8	1.00				
		Native Herbaceous Cover (%)	45	FALSE				
	Bed Form Diversity	Pool Spacing Ratio	0	0.00	0.00			
		Pool Depth Ratio	0	0.00				
		Percent Riffle (%)	0	0.00				
		Aggradation Ratio						
Physicochemical	Temperature	July Mean Temperature (°F)	68.6	1.00	1.00	0.62	Functioning At Risk	
	Bacteria	E. Coli (cfu/100 ml)	183.55	0.81	0.81			
	Nutrients	Total Phosphorus (mcg/L)	14	0.68	0.68			
	Dissolved Oxygen	DO Concentration (mg/L)	2.41	0.00	0.00			
Biology	Macroinvertebrates	Macroinvertebrate P51 Index Score	-5	0.23	0.23	0.24	Not Functioning	
		Macroinvertebrate P22 Index Score						
	Fish	Fish P51 Index Score	-5	0.25	0.25			

Site Information and Reference Standard Stratification	
Project Name:	White Pine
Reach ID:	2b
Restoration Potential:	NA
Existing Stream Length (ft):	184
Proposed Stream Length (ft):	
Existing Stream Type:	C
Proposed/ Reference Stream Type:	C
Valley Type:	Unconfined Alluvial
Drainage Area (sq. mi.):	
Strahler Stream Order:	First
Flow Type:	Perennial
Ecoregion:	Northern Lakes and Forests
Bed Material:	Silt/Clay
Stream Slope (%):	Impounded
Stream Temperature:	Warm
Wadeable/Non-wadeable:	Wadeable
Reference Vegetation Community:	Forested

Notes
1. Users input values that are highlighted based on restoration potential
2. Users select values from a pull-down menu
3. Leave values blank for field values that were not measured and/or autopopulate

FUNCTIONAL CHANGE SUMMARY	
Existing Condition Score (ECS)	0.43
Proposed Condition Score (PCS)	
Change in Functional Condition (PCS - ECS)	
Percent Condition Change	
Existing Stream Length (ft)	184
Proposed Stream Length (ft)	
Additional Stream Length (ft)	
Existing Functional Foot Score (FFS)	79
Proposed Functional Foot Score (FFS)	
Proposed FFS - Existing FFS (ΔFF)	
Yield (ΔFF/Proposed LF)	

BMP FUNCTIONAL CHANGE SUMMARY	
Existing BMP Functional Feet Score (FFS)	0
Proposed BMP Functional Feet Score (FFS)	0
Proposed BMP FFS - Existing BMP FFS	0

FUNCTIONAL FEET (FF) SUMMARY	
Existing Stream FFS + Existing BMP FFS	79
Proposed Stream FFS + Proposed BMP FFS	
Total Proposed FFS - Total Existing FFS	
Yield (ΔFF/Proposed LF)	

FUNCTION-BASED PARAMETER SUMMARY			
Functional Category	**Function-Based Parameters**	**Existing Parameter**	**Proposed Parameter**
Hydrology	Reach Runoff	1.00	
Hydraulics	Floodplain Connectivity	0.00	
Geomorphology	Large Woody Debris	0.00	
	Lateral Migration	0.62	
	Riparian Vegetation	0.50	
	Bed Form Diversity	0.00	
Physicochemical	Temperature	1.00	
	Bacteria	0.81	
	Nutrients	0.68	
	Dissolved Oxygen	0.00	
Biology	Macroinvertebrates	0.23	
	Fish	0.25	

FUNCTIONAL CATEGORY REPORT CARD			
Functional Category	**ECS**	**PCS**	**Functional Change**
Hydrology	1.00		
Hydraulics	0.00		
Geomorphology	0.28		
Physicochemical	0.62		
Biology	0.24		

Reach ID:2b

EXISTING CONDITION ASSESSMENT					Roll Up Scoring			
Functional Category	**Function-Based Parameters**	**Metric**	**Field Value**	**Index Value**	**Parameter**	**Category**	**Category**	**Overall**
Hydrology	Reach Runoff	Land Use Change Coefficient	30	1.00	1.00	1.00	Functioning	0.43
		Concentrated Flow Points (#/1000 LF)	0	1.00				
Hydraulics	Floodplain Connectivity	Bank Height Ratio	10	0.00	0.00	0.00	Not Functioning	
		Entrenchment Ratio	0	0.00				
Geomorphology	Large Woody Debris	LWD Index	0	0.00	0.00	0.28	Not Functioning	
	Lateral Migration	Dominant BEHI/NBS	H/VL	0.50	0.62			
		Percent Streambank Erosion (%)	42	0.35				
		Percent Streambank Armoring (%)	0	1.00				
	Riparian Vegetation	Buffer Width (ft)	180	1.00	0.50			
		Average DBH (Inches)	0	0.00				
		Tree Density (#/Ac)	0	0.00				
		Native Shrub/Sapling Density (#/Ac)	1864.4	1.00				
		Native Herbaceous Cover (%)	40	FALSE				
	Bed Form Diversity	Pool Spacing Ratio	0	0.00	0.00			
		Pool Depth Ratio	0	0.00				
		Percent Riffle (%)	0	0.00				
		Aggradation Ratio						
Physicochemical	Temperature	July Mean Temperature (°F)	68.6	1.00	1.00	0.62	Functioning At Risk	
	Bacteria	E. Coli (cfu/100 ml)	183.55	0.81	0.81			
	Nutrients	Total Phosphorus (mcg/L)	14	0.68	0.68			
	Dissolved Oxygen	DO Concentration (mg/L)	2.41	0.00	0.00			
Biology	Macroinvertebrates	Macroinvertebrate P51 Index Score	-5	0.23	0.23	0.24	Not Functioning	
		Macroinvertebrate P22 Index Score						
	Fish	Fish P51 Index Score	-5	0.25	0.25			

Site Information and Reference Standard Stratification	
Project Name:	White Pine
Reach ID:	2c
Restoration Potential:	NA
Existing Stream Length (ft):	602
Proposed Stream Length (ft):	
Existing Stream Type:	Bc
Proposed/ Reference Stream Type:	Bc
Valley Type:	Confined Alluvial
Drainage Area (sq. mi.):	
Strahler Stream Order:	First
Flow Type:	Perennial
Ecoregion:	Northern Lakes and Forests
Bed Material:	Silt/Clay
Stream Slope (%):	1.6
Stream Temperature:	Warm
Wadeable/Non-wadeable:	Wadeable
Reference Vegetation Community:	Forested

Notes
1. Users input values that are highlighted based on restoration potential
2. Users select values from a pull-down menu
3. Leave values blank for field values that were not measured and/or autopopulate

FUNCTIONAL CHANGE SUMMARY	
Existing Condition Score (ECS)	0.64
Proposed Condition Score (PCS)	
Change in Functional Condition (PCS - ECS)	
Percent Condition Change	
Existing Stream Length (ft)	602
Proposed Stream Length (ft)	
Additional Stream Length (ft)	
Existing Functional Foot Score (FFS)	385
Proposed Functional Foot Score (FFS)	
Proposed FFS - Existing FFS (ΔFF)	
Yield (ΔFF/Proposed LF)	

BMP FUNCTIONAL CHANGE SUMMARY	
Existing BMP Functional Feet Score (FFS)	0
Proposed BMP Functional Feet Score (FFS)	0
Proposed BMP FFS - Existing BMP FFS	0

FUNCTIONAL FEET (FF) SUMMARY	
Existing Stream FFS + Existing BMP FFS	385
Proposed Stream FFS + Proposed BMP FFS	
Total Proposed FFS - Total Existing FFS	
Yield (ΔFF/Proposed LF)	

FUNCTION-BASED PARAMETER SUMMARY			
Functional Category	**Function-Based Parameters**	**Existing Parameter**	**Proposed Parameter**
Hydrology	Reach Runoff	1.00	
Hydraulics	Floodplain Connectivity	0.74	
Geomorphology	Large Woody Debris	0.03	
	Lateral Migration	0.76	
	Riparian Vegetation	0.72	
	Bed Form Diversity	0.95	
Physicochemical	Temperature	1.00	
	Bacteria	0.81	
	Nutrients	0.68	
	Dissolved Oxygen	0.00	
Biology	Macroinvertebrates	0.23	
	Fish	0.25	

FUNCTIONAL CATEGORY REPORT CARD			
Functional Category	**ECS**	**PCS**	**Functional Change**
Hydrology	1.00		
Hydraulics	0.74		
Geomorphology	0.61		
Physicochemical	0.62		
Biology	0.24		

Reach ID:2c

EXISTING CONDITION ASSESSMENT					Roll Up Scoring			
Functional Category	**Function-Based Parameters**	**Metric**	**Field Value**	**Index Value**	**Parameter**	**Category**	**Category**	**Overall**
Hydrology	Reach Runoff	Land Use Change Coefficient	30	1.00	1.00	1.00	Functioning	0.64
		Concentrated Flow Points (#/1000 LF)	0	1.00				
Hydraulics	Floodplain Connectivity	Bank Height Ratio	1.18	0.75	0.74	0.74	Functioning	
		Entrenchment Ratio	1.44	0.72				
Geomorphology	Large Woody Debris	LWD Index	51	0.03	0.03	0.61	Functioning At Risk	
	Lateral Migration	Dominant BEHI/NBS	M/L	0.60	0.76			
		Percent Streambank Erosion (%)	11	0.69				
		Percent Streambank Armoring (%)	0	1.00				
	Riparian Vegetation	Buffer Width (ft)	180	1.00	0.72			
		Average DBH (Inches)	4.4	0.37				
		Tree Density (#/Ac)	323.6	0.50				
		Native Shrub/Sapling Density (#/Ac)	123.3	1.00				
		Native Herbaceous Cover (%)	40	FALSE				
	Bed Form Diversity	Pool Spacing Ratio	2.42	1.00	0.95			
		Pool Depth Ratio	3.38	1.00				
		Percent Riffle (%)	52.6	1.00				
		Aggradation Ratio	1.15	0.78				
Physicochemical	Temperature	July Mean Temperature (°F)	68.6	1.00	1.00	0.62	Functioning At Risk	
	Bacteria	E. Coli (cfu/100 ml)	183.55	0.81	0.81			
	Nutrients	Total Phosphorus (mcg/L)	14	0.68	0.68			
	Dissolved Oxygen	DO Concentration (mg/L)	2.41	0.00	0.00			
Biology	Macroinvertebrates	Macroinvertebrate P51 Index Score	-5	0.23	0.23	0.24	Not Functioning	
		Macroinvertebrate P22 Index Score						
	Fish	Fish P51 Index Score	-5	0.25	0.25			

Site Information and Reference Standard Stratification	
Project Name:	White Pine
Reach ID:	2d
Restoration Potential:	NA
Existing Stream Length (ft):	947
Proposed Stream Length (ft):	
Existing Stream Type:	C
Proposed/ Reference Stream Type:	C
Valley Type:	Unconfined Alluvial
Drainage Area (sq. mi.):	
Strahler Stream Order:	First
Flow Type:	Perennial
Ecoregion:	Northern Lakes and Forests
Bed Material:	Silt/Clay
Stream Slope (%):	0.5
Stream Temperature:	Warm
Wadeable/Non-wadeable:	Wadeable
Reference Vegetation Community:	Forested

Notes
1. Users input values that are highlighted based on restoration potential
2. Users select values from a pull-down menu
3. Leave values blank for field values that were not measured and/or autopopulate

FUNCTIONAL CHANGE SUMMARY	
Existing Condition Score (ECS)	0.60
Proposed Condition Score (PCS)	
Change in Functional Condition (PCS - ECS)	
Percent Condition Change	
Existing Stream Length (ft)	947
Proposed Stream Length (ft)	
Additional Stream Length (ft)	
Existing Functional Foot Score (FFS)	568
Proposed Functional Foot Score (FFS)	
Proposed FFS - Existing FFS (ΔFF)	
Yield (ΔFF/Proposed LF)	

BMP FUNCTIONAL CHANGE SUMMARY	
Existing BMP Functional Feet Score (FFS)	0
Proposed BMP Functional Feet Score (FFS)	0
Proposed BMP FFS - Existing BMP FFS	0

FUNCTIONAL FEET (FF) SUMMARY	
Existing Stream FFS + Existing BMP FFS	568
Proposed Stream FFS + Proposed BMP FFS	
Total Proposed FFS - Total Existing FFS	
Yield (ΔFF/Proposed LF)	

FUNCTION-BASED PARAMETER SUMMARY			
Functional Category	**Function-Based Parameters**	**Existing Parameter**	**Proposed Parameter**
Hydrology	Reach Runoff	1.00	
Hydraulics	Floodplain Connectivity	0.49	
Geomorphology	Large Woody Debris	0.18	
	Lateral Migration	1.00	
	Riparian Vegetation	0.74	
	Bed Form Diversity	0.65	
Physicochemical	Temperature	1.00	
	Bacteria	0.81	
	Nutrients	0.68	
	Dissolved Oxygen	0.00	
Biology	Macroinvertebrates	0.23	
	Fish	0.25	

FUNCTIONAL CATEGORY REPORT CARD			
Functional Category	**ECS**	**PCS**	**Functional Change**
Hydrology	1.00		
Hydraulics	0.49		
Geomorphology	0.64		
Physicochemical	0.62		
Biology	0.24		

Reach ID: 2d

EXISTING CONDITION ASSESSMENT					Roll Up Scoring			
Functional Category	**Function-Based Parameters**	**Metric**	**Field Value**	**Index Value**	**Parameter**	**Category**	**Category**	**Overall**
Hydrology	Reach Runoff	Land Use Change Coefficient	30	1.00	1.00	1.00	Functioning	0.60
		Concentrated Flow Points (#/1000 LF)	0	1.00				
Hydraulics	Floodplain Connectivity	Bank Height Ratio	1.07	0.90	0.49	0.49	Functioning At Risk	
		Entrenchment Ratio	1.77	0.07				
Geomorphology	Large Woody Debris	LWD Index	345	0.18	0.18	0.64	Functioning At Risk	
	Lateral Migration	Dominant BEHI/NBS	L/L	1.00	1.00			
		Percent Streambank Erosion (%)	4	1.00				
		Percent Streambank Armoring (%)	0	1.00				
	Riparian Vegetation	Buffer Width (ft)	180	1.00	0.74			
		Average DBH (Inches)	5.7	0.47				
		Tree Density (#/Ac)	46.2	0.49				
		Native Shrub/Sapling Density (#/Ac)	924.5	1.00				
		Native Herbaceous Cover (%)	85	FALSE				
	Bed Form Diversity	Pool Spacing Ratio	4.1	1.00	0.65			
		Pool Depth Ratio	2.8	0.94				
		Percent Riffle (%)	32.8	0.51				
		Aggradation Ratio	1.5	0.13				
Physicochemical	Temperature	July Mean Temperature (°F)	68.6	1.00	1.00	0.62	Functioning At Risk	
	Bacteria	E. Coli (cfu/100 ml)	183.55	0.81	0.81			
	Nutrients	Total Phosphorus (mcg/L)	14	0.68	0.68			
	Dissolved Oxygen	DO Concentration (mg/L)	2.4	0.00	0.00			
Biology	Macroinvertebrates	Macroinvertebrate P51 Index Score	-5	0.23	0.23	0.24	Not Functioning	
		Macroinvertebrate P22 Index Score						
	Fish	Fish P51 Index Score	-5	0.25	0.25			

Site Information and Reference Standard Stratification	
Project Name:	White Pine
Reach ID:	3A
Restoration Potential:	NA
Existing Stream Length (ft):	240
Proposed Stream Length (ft):	
Existing Stream Type:	C
Proposed/ Reference Stream Type:	C
Valley Type:	Unconfined Alluvial
Drainage Area (sq. mi.):	
Strahler Stream Order:	First
Flow Type:	Perennial
Ecoregion:	Northern Lakes and Forests
Bed Material:	Gravel
Stream Slope (%):	1.8
Stream Temperature:	Warm
Wadeable/Non-wadeable:	Wadeable
Reference Vegetation Community:	Forested

Notes
1. Users input values that are highlighted based on restoration potential
2. Users select values from a pull-down menu
3. Leave values blank for field values that were not measured and/or autopopulate

FUNCTIONAL CHANGE SUMMARY	
Existing Condition Score (ECS)	0.53
Proposed Condition Score (PCS)	
Change in Functional Condition (PCS - ECS)	
Percent Condition Change	
Existing Stream Length (ft)	240
Proposed Stream Length (ft)	
Additional Stream Length (ft)	
Existing Functional Foot Score (FFS)	127
Proposed Functional Foot Score (FFS)	
Proposed FFS - Existing FFS (ΔFF)	
Yield (ΔFF/Proposed LF)	

BMP FUNCTIONAL CHANGE SUMMARY	
Existing BMP Functional Feet Score (FFS)	0
Proposed BMP Functional Feet Score (FFS)	0
Proposed BMP FFS - Existing BMP FFS	0

FUNCTIONAL FEET (FF) SUMMARY	
Existing Stream FFS + Existing BMP FFS	127
Proposed Stream FFS + Proposed BMP FFS	
Total Proposed FFS - Total Existing FFS	
Yield (ΔFF/Proposed LF)	

FUNCTION-BASED PARAMETER SUMMARY			
Functional Category	**Function-Based Parameters**	**Existing Parameter**	**Proposed Parameter**
Hydrology	Reach Runoff	1.00	
Hydraulics	Floodplain Connectivity	0.24	
Geomorphology	Large Woody Debris	0.16	
	Lateral Migration	0.74	
	Riparian Vegetation	0.70	
	Bed Form Diversity	0.60	
Physicochemical	Temperature	1.00	
	Bacteria	0.81	
	Nutrients	0.68	
	Dissolved Oxygen	0.00	
Biology	Macroinvertebrates	0.23	
	Fish	0.25	

FUNCTIONAL CATEGORY REPORT CARD			
Functional Category	**ECS**	**PCS**	**Functional Change**
Hydrology	1.00		
Hydraulics	0.24		
Geomorphology	0.55		
Physicochemical	0.62		
Biology	0.24		

Reach ID: 3A

EXISTING CONDITION ASSESSMENT					Roll Up Scoring			
Functional Category	**Function-Based Parameters**	**Metric**	**Field Value**	**Index Value**	**Parameter**	**Category**	**Category**	**Overall**
Hydrology	Reach Runoff	Land Use Change Coefficient	30	1.00	1.00	1.00	Functioning	0.53
		Concentrated Flow Points (#/1000 LF)	0	1.00				
Hydraulics	Floodplain Connectivity	Bank Height Ratio	1.61	0.15	0.24	0.24	Not Functioning	
		Entrenchment Ratio	2.03	0.33				
Geomorphology	Large Woody Debris	LWD Index	305	0.16	0.16	0.55	Functioning At Risk	
	Lateral Migration	Dominant BEHI/NBS	M/L	0.60	0.74			
		Percent Streambank Erosion (%)	18	0.61				
		Percent Streambank Armoring (%)	0	1.00				
	Riparian Vegetation	Buffer Width (ft)	80	0.74	0.70			
		Average DBH (Inches)	4.7	0.39				
		Tree Density (#/Ac)	61.6	0.65				
		Native Shrub/Sapling Density (#/Ac)	1463.8	1.00				
		Native Herbaceous Cover (%)	100	FALSE				
	Bed Form Diversity	Pool Spacing Ratio	2	0.40	0.60			
		Pool Depth Ratio	3.06	1.00				
		Percent Riffle (%)	55.45	1.00				
		Aggradation Ratio	2.1	0.00				
Physicochemical	Temperature	July Mean Temperature (°F)	68.6	1.00	1.00	0.62	Functioning At Risk	
	Bacteria	E. Coli (cfu/100 ml)	183.55	0.81	0.81			
	Nutrients	Total Phosphorus (mcg/L)	14	0.68	0.68			
	Dissolved Oxygen	DO Concentration (mg/L)	2.41	0.00	0.00			
Biology	Macroinvertebrates	Macroinvertebrate P51 Index Score	-5	0.23	0.23	0.24	Not Functioning	
		Macroinvertebrate P22 Index Score						
	Fish	Fish P51 Index Score	-5	0.25	0.25			

Site Information and Reference Standard Stratification	
Project Name:	White Pine
Reach ID:	3B
Restoration Potential:	NA
Existing Stream Length (ft):	475
Proposed Stream Length (ft):	
Existing Stream Type:	C
Proposed/ Reference Stream Type:	C
Valley Type:	Unconfined Alluvial
Drainage Area (sq. mi.):	
Strahler Stream Order:	First
Flow Type:	Perennial
Ecoregion:	Northern Lakes and Forests
Bed Material:	Silt/Clay
Stream Slope (%):	Impounded
Stream Temperature:	Warm
Wadeable/Non-wadeable:	Wadeable
Reference Vegetation Community:	Forested

Notes
1. Users input values that are highlighted based on restoration potential
2. Users select values from a pull-down menu
3. Leave values blank for field values that were not measured and/or autopopulate

FUNCTIONAL CHANGE SUMMARY	
Existing Condition Score (ECS)	0.46
Proposed Condition Score (PCS)	
Change in Functional Condition (PCS - ECS)	
Percent Condition Change	
Existing Stream Length (ft)	475
Proposed Stream Length (ft)	
Additional Stream Length (ft)	
Existing Functional Foot Score (FFS)	219
Proposed Functional Foot Score (FFS)	
Proposed FFS - Existing FFS (ΔFF)	
Yield (ΔFF/Proposed LF)	

BMP FUNCTIONAL CHANGE SUMMARY	
Existing BMP Functional Feet Score (FFS)	0
Proposed BMP Functional Feet Score (FFS)	0
Proposed BMP FFS - Existing BMP FFS	0

FUNCTIONAL FEET (FF) SUMMARY	
Existing Stream FFS + Existing BMP FFS	219
Proposed Stream FFS + Proposed BMP FFS	
Total Proposed FFS - Total Existing FFS	
Yield (ΔFF/Proposed LF)	

FUNCTION-BASED PARAMETER SUMMARY			
Functional Category	**Function-Based Parameters**	**Existing Parameter**	**Proposed Parameter**
Hydrology	Reach Runoff	1.00	
Hydraulics	Floodplain Connectivity	0.00	
Geomorphology	Large Woody Debris	0.08	
	Lateral Migration	0.90	
	Riparian Vegetation	0.79	
	Bed Form Diversity	0.00	
Physicochemical	Temperature	1.00	
	Bacteria	0.81	
	Nutrients	0.68	
	Dissolved Oxygen	0.00	
Biology	Macroinvertebrates	0.23	
	Fish	0.25	

FUNCTIONAL CATEGORY REPORT CARD			
Functional Category	**ECS**	**PCS**	**Functional Change**
Hydrology	1.00		
Hydraulics	0.00		
Geomorphology	0.44		
Physicochemical	0.62		
Biology	0.24		

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Reach ID:3B

EXISTING CONDITION ASSESSMENT					Roll Up Scoring			
Functional Category	**Function-Based Parameters**	**Metric**	**Field Value**	**Index Value**	**Parameter**	**Category**	**Category**	**Overall**
Hydrology	Reach Runoff	Land Use Change Coefficient	30	1.00	1.00	1.00	Functioning	0.46
		Concentrated Flow Points (#/1000 LF)	0	1.00				
Hydraulics	Floodplain Connectivity	Bank Height Ratio	10	0.00	0.00	0.00	Not Functioning	
		Entrenchment Ratio	0	0.00				
Geomorphology	Large Woody Debris	LWD Index	160	0.08	0.08	0.44	Functioning At Risk	
	Lateral Migration	Dominant BEHI/NBS	L/L	1.00	0.90			
		Percent Streambank Erosion (%)	10	0.70				
		Percent Streambank Armoring (%)	0	1.00				
	Riparian Vegetation	Buffer Width (ft)	80	0.74	0.79			
		Average DBH (Inches)	4.8	0.40				
		Tree Density (#/Ac)	200.3	1.00				
		Native Shrub/Sapling Density (#/Ac)	1494.6	1.00				
		Native Herbaceous Cover (%)	60	FALSE				
	Bed Form Diversity	Pool Spacing Ratio	0	0.00	0.00			
		Pool Depth Ratio	0	0.00				
		Percent Riffle (%)	0	0.00				
		Aggradation Ratio						
Physicochemical	Temperature	July Mean Temperature (°F)	68.6	1.00	1.00	0.62	Functioning At Risk	
	Bacteria	E. Coli (cfu/100 ml)	183.55	0.81	0.81			
	Nutrients	Total Phosphorus (mcg/L)	14	0.68	0.68			
	Dissolved Oxygen	DO Concentration (mg/L)	2.41	0.00	0.00			
Biology	Macroinvertebrates	Macroinvertebrate P51 Index Score	-5	0.23	0.23	0.24	Not Functioning	
		Macroinvertebrate P22 Index Score						
	Fish	Fish P51 Index Score	-5	0.25	0.25			

Site Information and Reference Standard Stratification	
Project Name:	White Pine
Reach ID:	3C
Restoration Potential:	NA
Existing Stream Length (ft):	534
Proposed Stream Length (ft):	
Existing Stream Type:	C
Proposed/ Reference Stream Type:	C
Valley Type:	Unconfined Alluvial
Drainage Area (sq. mi.):	
Strahler Stream Order:	First
Flow Type:	Perennial
Ecoregion:	Northern Lakes and Forests
Bed Material:	Silt/Clay
Stream Slope (%):	Impounded
Stream Temperature:	Warm
Wadeable/Non-wadeable:	Wadeable
Reference Vegetation Community:	Forested

Notes
1. Users input values that are highlighted based on restoration potential
2. Users select values from a pull-down menu
3. Leave values blank for field values that were not measured and/or autopopulate

FUNCTIONAL CHANGE SUMMARY	
Existing Condition Score (ECS)	0.46
Proposed Condition Score (PCS)	
Change in Functional Condition (PCS - ECS)	
Percent Condition Change	
Existing Stream Length (ft)	534
Proposed Stream Length (ft)	
Additional Stream Length (ft)	
Existing Functional Foot Score (FFS)	246
Proposed Functional Foot Score (FFS)	
Proposed FFS - Existing FFS (ΔFF)	
Yield (ΔFF/Proposed LF)	

BMP FUNCTIONAL CHANGE SUMMARY	
Existing BMP Functional Feet Score (FFS)	0
Proposed BMP Functional Feet Score (FFS)	0
Proposed BMP FFS - Existing BMP FFS	0

FUNCTIONAL FEET (FF) SUMMARY	
Existing Stream FFS + Existing BMP FFS	246
Proposed Stream FFS + Proposed BMP FFS	
Total Proposed FFS - Total Existing FFS	
Yield (ΔFF/Proposed LF)	

FUNCTION-BASED PARAMETER SUMMARY			
Functional Category	**Function-Based Parameters**	**Existing Parameter**	**Proposed Parameter**
Hydrology	Reach Runoff	1.00	
Hydraulics	Floodplain Connectivity	0.00	
Geomorphology	Large Woody Debris	0.06	
	Lateral Migration	1.00	
	Riparian Vegetation	0.79	
	Bed Form Diversity	0.00	
Physicochemical	Temperature	1.00	
	Bacteria	0.81	
	Nutrients	0.68	
	Dissolved Oxygen	0.00	
Biology	Macroinvertebrates	0.23	
	Fish	0.25	

FUNCTIONAL CATEGORY REPORT CARD			
Functional Category	**ECS**	**PCS**	**Functional Change**
Hydrology	1.00		
Hydraulics	0.00		
Geomorphology	0.46		
Physicochemical	0.62		
Biology	0.24		

Reach ID: 3C

EXISTING CONDITION ASSESSMENT					Roll Up Scoring			
Functional Category	**Function-Based Parameters**	**Metric**	**Field Value**	**Index Value**	**Parameter**	**Category**	**Category**	**Overall**
Hydrology	Reach Runoff	Land Use Change Coefficient	30	1.00	1.00	1.00	Functioning	0.46
		Concentrated Flow Points (#/1000 LF)	0	1.00				
Hydraulics	Floodplain Connectivity	Bank Height Ratio	10	0.00	0.00	0.00	Not Functioning	
		Entrenchment Ratio	0	0.00				
Geomorphology	Large Woody Debris	LWD Index	125	0.06	0.06	0.46	Functioning At Risk	
	Lateral Migration	Dominant BEHI/NBS	L/L	1.00	1.00			
		Percent Streambank Erosion (%)	0	1.00				
		Percent Streambank Armoring (%)	0	1.00				
	Riparian Vegetation	Buffer Width (ft)	80	0.74	0.79			
		Average DBH (Inches)	4.8	0.40				
		Tree Density (#/Ac)	200.3	1.00				
		Native Shrub/Sapling Density (#/Ac)	1494.6	1.00				
		Native Herbaceous Cover (%)	60	FALSE				
	Bed Form Diversity	Pool Spacing Ratio	0	0.00	0.00			
		Pool Depth Ratio	0	0.00				
		Percent Riffle (%)	0	0.00				
		Aggradation Ratio						
Physicochemical	Temperature	July Mean Temperature (°F)	68.6	1.00	1.00	0.62	Functioning At Risk	
	Bacteria	E. Coli (cfu/100 ml)	183.55	0.81	0.81			
	Nutrients	Total Phosphorus (mcg/L)	14	0.68	0.68			
	Dissolved Oxygen	DO Concentration (mg/L)	2.41	0.00	0.00			
Biology	Macroinvertebrates	Macroinvertebrate P51 Index Score	-5	0.23	0.23	0.24	Not Functioning	
		Macroinvertebrate P22 Index Score						
	Fish	Fish P51 Index Score	-5	0.25	0.25			

Site Information and Reference Standard Stratification	
Project Name:	White Pine
Reach ID:	4A
Restoration Potential:	NA
Existing Stream Length (ft):	300
Proposed Stream Length (ft):	
Existing Stream Type:	E
Proposed/ Reference Stream Type:	E
Valley Type:	Unconfined Alluvial
Drainage Area (sq. mi.):	
Strahler Stream Order:	First
Flow Type:	Perennial
Ecoregion:	Northern Lakes and Forests
Bed Material:	Silt/Clay
Stream Slope (%):	3.1
Stream Temperature:	Warm
Wadeable/Non-wadeable:	Wadeable
Reference Vegetation Community:	Forested

Notes
1. Users input values that are highlighted based on restoration potential
2. Users select values from a pull-down menu
3. Leave values blank for field values that were not measured and/or autopopulate

FUNCTIONAL CHANGE SUMMARY	
Existing Condition Score (ECS)	0.68
Proposed Condition Score (PCS)	
Change in Functional Condition (PCS - ECS)	
Percent Condition Change	
Existing Stream Length (ft)	300
Proposed Stream Length (ft)	
Additional Stream Length (ft)	
Existing Functional Foot Score (FFS)	204
Proposed Functional Foot Score (FFS)	
Proposed FFS - Existing FFS (ΔFF)	
Yield (ΔFF/Proposed LF)	

BMP FUNCTIONAL CHANGE SUMMARY	
Existing BMP Functional Feet Score (FFS)	0
Proposed BMP Functional Feet Score (FFS)	0
Proposed BMP FFS - Existing BMP FFS	0

FUNCTIONAL FEET (FF) SUMMARY	
Existing Stream FFS + Existing BMP FFS	204
Proposed Stream FFS + Proposed BMP FFS	
Total Proposed FFS - Total Existing FFS	
Yield (ΔFF/Proposed LF)	

FUNCTION-BASED PARAMETER SUMMARY			
Functional Category	**Function-Based Parameters**	**Existing Parameter**	**Proposed Parameter**
Hydrology	Reach Runoff	1.00	
Hydraulics	Floodplain Connectivity	0.88	
Geomorphology	Large Woody Debris	0.13	
	Lateral Migration	1.00	
	Riparian Vegetation	0.87	
	Bed Form Diversity	0.58	
Physicochemical	Temperature	1.00	
	Bacteria	0.81	
	Nutrients	0.68	
	Dissolved Oxygen	0.00	
Biology	Macroinvertebrates	0.23	
	Fish	0.25	

FUNCTIONAL CATEGORY REPORT CARD			
Functional Category	**ECS**	**PCS**	**Functional Change**
Hydrology	1.00		
Hydraulics	0.88		
Geomorphology	0.64		
Physicochemical	0.62		
Biology	0.24		

Reach ID: 4A

EXISTING CONDITION ASSESSMENT					Roll Up Scoring			
Functional Category	**Function-Based Parameters**	**Metric**	**Field Value**	**Index Value**	**Parameter**	**Category**	**Category**	**Overall**
Hydrology	Reach Runoff	Land Use Change Coefficient	30	1.00	1.00	1.00	Functioning	0.68
		Concentrated Flow Points (#/1000 LF)	0	1.00				
Hydraulics	Floodplain Connectivity	Bank Height Ratio	1	1.00	0.88	0.88	Functioning	
		Entrenchment Ratio	2.9	0.76				
Geomorphology	Large Woody Debris	LWD Index	251	0.13	0.13	0.64	Functioning At Risk	
	Lateral Migration	Dominant BEHI/NBS	L/L	1.00	1.00			
		Percent Streambank Erosion (%)	0	1.00				
		Percent Streambank Armoring (%)	0	1.00				
	Riparian Vegetation	Buffer Width (ft)	180	1.00	0.87			
		Average DBH (Inches)	5.7	0.47				
		Tree Density (#/Ac)	138.7	1.00				
		Native Shrub/Sapling Density (#/Ac)	1217.3	1.00				
		Native Herbaceous Cover (%)	100	FALSE				
	Bed Form Diversity	Pool Spacing Ratio	11.86	0.00	0.58			
		Pool Depth Ratio	5.33	1.00				
		Percent Riffle (%)	52.67	1.00				
		Aggradation Ratio	1.39	0.32				
Physicochemical	Temperature	July Mean Temperature (°F)	68.6	1.00	1.00	0.62	Functioning At Risk	
	Bacteria	E. Coli (cfu/100 ml)	183.55	0.81	0.81			
	Nutrients	Total Phosphorus (mcg/L)	14	0.68	0.68			
	Dissolved Oxygen	DO Concentration (mg/L)	2.41	0.00	0.00			
Biology	Macroinvertebrates	Macroinvertebrate P51 Index Score	-5	0.23	0.23	0.24	Not Functioning	
		Macroinvertebrate P22 Index Score						
	Fish	Fish P51 Index Score	-5	0.25	0.25			

Site Information and Reference Standard Stratification	
Project Name:	White Pine
Reach ID:	4B
Restoration Potential:	NA
Existing Stream Length (ft):	578
Proposed Stream Length (ft):	
Existing Stream Type:	E
Proposed/ Reference Stream Type:	E
Valley Type:	Unconfined Alluvial
Drainage Area (sq. mi.):	
Strahler Stream Order:	First
Flow Type:	Perennial
Ecoregion:	Northern Lakes and Forests
Bed Material:	Silt/Clay
Stream Slope (%):	3.1
Stream Temperature:	Warm
Wadeable/Non-wadeable:	Wadeable
Reference Vegetation Community:	Forested

Notes
1. Users input values that are highlighted based on restoration potential
2. Users select values from a pull-down menu
3. Leave values blank for field values that were not measured and/or autopopulate

FUNCTIONAL CHANGE SUMMARY	
Existing Condition Score (ECS)	0.68
Proposed Condition Score (PCS)	
Change in Functional Condition (PCS - ECS)	
Percent Condition Change	
Existing Stream Length (ft)	578
Proposed Stream Length (ft)	
Additional Stream Length (ft)	
Existing Functional Foot Score (FFS)	393
Proposed Functional Foot Score (FFS)	
Proposed FFS - Existing FFS (ΔFF)	
Yield (ΔFF/Proposed LF)	

BMP FUNCTIONAL CHANGE SUMMARY	
Existing BMP Functional Feet Score (FFS)	0
Proposed BMP Functional Feet Score (FFS)	0
Proposed BMP FFS - Existing BMP FFS	0

FUNCTIONAL FEET (FF) SUMMARY	
Existing Stream FFS + Existing BMP FFS	393
Proposed Stream FFS + Proposed BMP FFS	
Total Proposed FFS - Total Existing FFS	
Yield (ΔFF/Proposed LF)	

FUNCTION-BASED PARAMETER SUMMARY			
Functional Category	**Function-Based Parameters**	**Existing Parameter**	**Proposed Parameter**
Hydrology	Reach Runoff	1.00	
Hydraulics	Floodplain Connectivity	0.88	
Geomorphology	Large Woody Debris	0.13	
	Lateral Migration	1.00	
	Riparian Vegetation	0.87	
	Bed Form Diversity	0.65	
Physicochemical	Temperature	1.00	
	Bacteria	0.81	
	Nutrients	0.68	
	Dissolved Oxygen	0.00	
Biology	Macroinvertebrates	0.23	
	Fish	0.25	

FUNCTIONAL CATEGORY REPORT CARD			
Functional Category	**ECS**	**PCS**	**Functional Change**
Hydrology	1.00		
Hydraulics	0.88		
Geomorphology	0.66		
Physicochemical	0.62		
Biology	0.24		

Reach ID: 4B

EXISTING CONDITION ASSESSMENT					Roll Up Scoring			
Functional Category	**Function-Based Parameters**	**Metric**	**Field Value**	**Index Value**	**Parameter**	**Category**	**Category**	**Overall**
Hydrology	Reach Runoff	Land Use Change Coefficient	30	1.00	1.00	1.00	Functioning	0.68
		Concentrated Flow Points (#/1000 LF)	0	1.00				
Hydraulics	Floodplain Connectivity	Bank Height Ratio	1	1.00	0.88	0.88	Functioning	
		Entrenchment Ratio	2.9	0.76				
Geomorphology	Large Woody Debris	LWD Index	251	0.13	0.13	0.66	Functioning At Risk	
	Lateral Migration	Dominant BEHI/NBS	L/L	1.00	1.00			
		Percent Streambank Erosion (%)	0	1.00				
		Percent Streambank Armoring (%)	0	1.00				
	Riparian Vegetation	Buffer Width (ft)	180	1.00	0.87			
		Average DBH (Inches)	5.7	0.47				
		Tree Density (#/Ac)	138.7	1.00				
		Native Shrub/Sapling Density (#/Ac)	1217.3	1.00				
		Native Herbaceous Cover (%)	100	FALSE				
	Bed Form Diversity	Pool Spacing Ratio	11.86	0.00	0.65			
		Pool Depth Ratio	5.33	1.00				
		Percent Riffle (%)	52.67	1.00				
		Aggradation Ratio	1.24	0.61				
Physicochemical	Temperature	July Mean Temperature (°F)	68.6	1.00	1.00	0.62	Functioning At Risk	
	Bacteria	E. Coli (cfu/100 ml)	183.55	0.81	0.81			
	Nutrients	Total Phosphorus (mcg/L)	14	0.68	0.68			
	Dissolved Oxygen	DO Concentration (mg/L)	2.41	0.00	0.00			
Biology	Macroinvertebrates	Macroinvertebrate P51 Index Score	-5	0.23	0.23	0.24	Not Functioning	
		Macroinvertebrate P22 Index Score						
	Fish	Fish P51 Index Score	-5	0.25	0.25			

Site Information and Reference Standard Stratification	
Project Name:	White Pine
Reach ID:	7
Restoration Potential:	NA
Existing Stream Length (ft):	428
Proposed Stream Length (ft):	
Existing Stream Type:	Bc
Proposed/ Reference Stream Type:	Bc
Valley Type:	Unconfined Alluvial
Drainage Area (sq. mi.):	
Strahler Stream Order:	Third
Flow Type:	Perennial
Ecoregion:	Northern Lakes and Forests
Bed Material:	Gravel
Stream Slope (%):	0.3
Stream Temperature:	Warm
Wadeable/Non-wadeable:	Wadeable
Reference Vegetation Community:	Forested

Notes
1. Users input values that are highlighted based on restoration potential
2. Users select values from a pull-down menu
3. Leave values blank for field values that were not measured and/or autopopulate

FUNCTIONAL CHANGE SUMMARY	
Existing Condition Score (ECS)	0.62
Proposed Condition Score (PCS)	
Change in Functional Condition (PCS - ECS)	
Percent Condition Change	
Existing Stream Length (ft)	428
Proposed Stream Length (ft)	
Additional Stream Length (ft)	
Existing Functional Foot Score (FFS)	265
Proposed Functional Foot Score (FFS)	
Proposed FFS - Existing FFS (ΔFF)	
Yield (ΔFF/Proposed LF)	

BMP FUNCTIONAL CHANGE SUMMARY	
Existing BMP Functional Feet Score (FFS)	0
Proposed BMP Functional Feet Score (FFS)	0
Proposed BMP FFS - Existing BMP FFS	0

FUNCTIONAL FEET (FF) SUMMARY	
Existing Stream FFS + Existing BMP FFS	265
Proposed Stream FFS + Proposed BMP FFS	
Total Proposed FFS - Total Existing FFS	
Yield (ΔFF/Proposed LF)	

FUNCTION-BASED PARAMETER SUMMARY			
Functional Category	**Function-Based Parameters**	**Existing Parameter**	**Proposed Parameter**
Hydrology	Reach Runoff	1.00	
Hydraulics	Floodplain Connectivity	0.07	
Geomorphology	Large Woody Debris	0.56	
	Lateral Migration	1.00	
	Riparian Vegetation	0.77	
	Bed Form Diversity	0.76	
Physicochemical	Temperature	1.00	
	Bacteria	0.96	
	Nutrients	0.58	
	Dissolved Oxygen	1.00	
Biology	Macroinvertebrates	0.28	
	Fish	0.45	

FUNCTIONAL CATEGORY REPORT CARD			
Functional Category	**ECS**	**PCS**	**Functional Change**
Hydrology	1.00		
Hydraulics	0.07		
Geomorphology	0.77		
Physicochemical	0.89		
Biology	0.37		

Reach ID: 7

EXISTING CONDITION ASSESSMENT					Roll Up Scoring			
Functional Category	**Function-Based Parameters**	**Metric**	**Field Value**	**Index Value**	**Parameter**	**Category**	**Category**	**Overall**
Hydrology	Reach Runoff	Land Use Change Coefficient	30	1.00	1.00	1.00	Functioning	0.62
		Concentrated Flow Points (#/1000 LF)	0	1.00				
Hydraulics	Floodplain Connectivity	Bank Height Ratio	3.14	0.00	0.07	0.07	Not Functioning	
		Entrenchment Ratio	1.12	0.14				
Geomorphology	Large Woody Debris	LWD Index	1080	0.56	0.56	0.77	Functioning	
	Lateral Migration	Dominant BEHI/NBS	L/L	1.00	1.00			
		Percent Streambank Erosion (%)	0	1.00				
		Percent Streambank Armoring (%)	0	1.00				
	Riparian Vegetation	Buffer Width (ft)	180	1.00	0.77			
		Average DBH (Inches)	7.1	0.59				
		Tree Density (#/Ac)	400.6	0.50				
		Native Shrub/Sapling Density (#/Ac)	1679.5	1.00				
		Native Herbaceous Cover (%)	65	FALSE				
	Bed Form Diversity	Pool Spacing Ratio	7.29	0.26	0.76			
		Pool Depth Ratio	2.52	0.86				
		Percent Riffle (%)	59.89	1.00				
		Aggradation Ratio	1.06	0.93				
Physicochemical	Temperature	July Mean Temperature (°F)	66.9	1.00	1.00	0.89	Functioning	
	Bacteria	E. Coli (cfu/100 ml)	46.97	0.96	0.96			
	Nutrients	Total Phosphorus (mcg/L)	23	0.58	0.58			
	Dissolved Oxygen	DO Concentration (mg/L)	6.23	1.00	1.00			
Biology	Macroinvertebrates	Macroinvertebrate P51 Index Score	-4	0.28	0.28	0.37	Functioning At Risk	
		Macroinvertebrate P22 Index Score						
	Fish	Fish P51 Index Score	-1	0.45	0.45			

Site Information and Reference Standard Stratification	
Project Name:	White Pine
Reach ID:	9a
Restoration Potential:	NA
Existing Stream Length (ft):	696
Proposed Stream Length (ft):	
Existing Stream Type:	Bc
Proposed/ Reference Stream Type:	Bc
Valley Type:	Unconfined Alluvial
Drainage Area (sq. mi.):	
Strahler Stream Order:	Third
Flow Type:	Perennial
Ecoregion:	Northern Lakes and Forests
Bed Material:	Bedrock
Stream Slope (%):	0.3
Stream Temperature:	Warm
Wadeable/Non-wadeable:	Wadeable
Reference Vegetation Community:	Forested

Notes
1. Users input values that are highlighted based on restoration potential
2. Users select values from a pull-down menu
3. Leave values blank for field values that were not measured and/or autopopulate

FUNCTIONAL CHANGE SUMMARY	
Existing Condition Score (ECS)	0.65
Proposed Condition Score (PCS)	
Change in Functional Condition (PCS - ECS)	
Percent Condition Change	
Existing Stream Length (ft)	696
Proposed Stream Length (ft)	
Additional Stream Length (ft)	
Existing Functional Foot Score (FFS)	452
Proposed Functional Foot Score (FFS)	
Proposed FFS - Existing FFS (ΔFF)	
Yield (ΔFF/Proposed LF)	

BMP FUNCTIONAL CHANGE SUMMARY	
Existing BMP Functional Feet Score (FFS)	0
Proposed BMP Functional Feet Score (FFS)	0
Proposed BMP FFS - Existing BMP FFS	0

FUNCTIONAL FEET (FF) SUMMARY	
Existing Stream FFS + Existing BMP FFS	452
Proposed Stream FFS + Proposed BMP FFS	
Total Proposed FFS - Total Existing FFS	
Yield (ΔFF/Proposed LF)	

FUNCTION-BASED PARAMETER SUMMARY			
Functional Category	**Function-Based Parameters**	**Existing Parameter**	**Proposed Parameter**
Hydrology	Reach Runoff	1.00	
Hydraulics	Floodplain Connectivity	0.38	
Geomorphology	Large Woody Debris	0.21	
	Lateral Migration	0.87	
	Riparian Vegetation	0.79	
	Bed Form Diversity	0.60	
Physicochemical	Temperature	1.00	
	Bacteria	0.96	
	Nutrients	0.58	
	Dissolved Oxygen	1.00	
Biology	Macroinvertebrates	0.28	
	Fish	0.45	

FUNCTIONAL CATEGORY REPORT CARD			
Functional Category	**ECS**	**PCS**	**Functional Change**
Hydrology	1.00		
Hydraulics	0.38		
Geomorphology	0.62		
Physicochemical	0.89		
Biology	0.37		

Reach ID:9a

EXISTING CONDITION ASSESSMENT					Roll Up Scoring			
Functional Category	**Function-Based Parameters**	**Metric**	**Field Value**	**Index Value**	**Parameter**	**Category**	**Category**	**Overall**
Hydrology	Reach Runoff	Land Use Change Coefficient	30	1.00	1.00	1.00	Functioning	0.65
		Concentrated Flow Points (#/1000 LF)	0	1.00				
Hydraulics	Floodplain Connectivity	Bank Height Ratio	1.59	0.17	0.38	0.38	Functioning At Risk	
		Entrenchment Ratio	1.34	0.58				
Geomorphology	Large Woody Debris	LWD Index	396	0.21	0.21	0.62	Functioning At Risk	
	Lateral Migration	Dominant BEHI/NBS	M/L	0.60	0.87			
		Percent Streambank Erosion (%)	0	1.00				
		Percent Streambank Armoring (%)	0	1.00				
	Riparian Vegetation	Buffer Width (ft)	180	1.00	0.79			
		Average DBH (Inches)	7.9	0.66				
		Tree Density (#/Ac)	493.1	0.50				
		Native Shrub/Sapling Density (#/Ac)	269.6	1.00				
		Native Herbaceous Cover (%)	27.5	FALSE				
	Bed Form Diversity	Pool Spacing Ratio	6.78	0.44	0.60			
		Pool Depth Ratio	1.77	0.51				
		Percent Riffle (%)	44.52	0.82				
		Aggradation Ratio	1.24	0.61				
Physicochemical	Temperature	July Mean Temperature (°F)	66.9	1.00	1.00	0.89	Functioning	
	Bacteria	E. Coli (cfu/100 ml)	46.97	0.96	0.96			
	Nutrients	Total Phosphorus (mcg/L)	23	0.58	0.58			
	Dissolved Oxygen	DO Concentration (mg/L)	6.23	1.00	1.00			
Biology	Macroinvertebrates	Macroinvertebrate P51 Index Score	-4	0.28	0.28	0.37	Functioning At Risk	
		Macroinvertebrate P22 Index Score						
	Fish	Fish P51 Index Score	-1	0.45	0.45			

Site Information and Reference Standard Stratification	
Project Name:	White Pine
Reach ID:	9b
Restoration Potential:	NA
Existing Stream Length (ft):	1287
Proposed Stream Length (ft):	
Existing Stream Type:	Bc
Proposed/ Reference Stream Type:	Bc
Valley Type:	Unconfined Alluvial
Drainage Area (sq. mi.):	
Strahler Stream Order:	Third
Flow Type:	Perennial
Ecoregion:	Northern Lakes and Forests
Bed Material:	Bedrock
Stream Slope (%):	0.3
Stream Temperature:	Warm
Wadeable/Non-wadeable:	Wadeable
Reference Vegetation Community:	Forested

Notes
1. Users input values that are highlighted based on restoration potential
2. Users select values from a pull-down menu
3. Leave values blank for field values that were not measured and/or autopopulate

FUNCTIONAL CHANGE SUMMARY	
Existing Condition Score (ECS)	0.64
Proposed Condition Score (PCS)	
Change in Functional Condition (PCS - ECS)	
Percent Condition Change	
Existing Stream Length (ft)	1287
Proposed Stream Length (ft)	
Additional Stream Length (ft)	
Existing Functional Foot Score (FFS)	824
Proposed Functional Foot Score (FFS)	
Proposed FFS - Existing FFS (ΔFF)	
Yield (ΔFF/Proposed LF)	

BMP FUNCTIONAL CHANGE SUMMARY	
Existing BMP Functional Feet Score (FFS)	0
Proposed BMP Functional Feet Score (FFS)	0
Proposed BMP FFS - Existing BMP FFS	0

FUNCTIONAL FEET (FF) SUMMARY	
Existing Stream FFS + Existing BMP FFS	824
Proposed Stream FFS + Proposed BMP FFS	
Total Proposed FFS - Total Existing FFS	
Yield (ΔFF/Proposed LF)	

FUNCTION-BASED PARAMETER SUMMARY			
Functional Category	**Function-Based Parameters**	**Existing Parameter**	**Proposed Parameter**
Hydrology	Reach Runoff	1.00	
Hydraulics	Floodplain Connectivity	0.38	
Geomorphology	Large Woody Debris	0.21	
	Lateral Migration	0.87	
	Riparian Vegetation	0.79	
	Bed Form Diversity	0.47	
Physicochemical	Temperature	1.00	
	Bacteria	0.96	
	Nutrients	0.58	
	Dissolved Oxygen	1.00	
Biology	Macroinvertebrates	0.28	
	Fish	0.45	

FUNCTIONAL CATEGORY REPORT CARD			
Functional Category	**ECS**	**PCS**	**Functional Change**
Hydrology	1.00		
Hydraulics	0.38		
Geomorphology	0.58		
Physicochemical	0.89		
Biology	0.37		

Reach ID: 9b

EXISTING CONDITION ASSESSMENT					Roll Up Scoring			
Functional Category	**Function-Based Parameters**	**Metric**	**Field Value**	**Index Value**	**Parameter**	**Category**	**Category**	**Overall**
Hydrology	Reach Runoff	Land Use Change Coefficient	30	1.00	1.00	1.00	Functioning	0.64
		Concentrated Flow Points (#/1000 LF)	0	1.00				
Hydraulics	Floodplain Connectivity	Bank Height Ratio	1.59	0.17	0.38	0.38	Functioning At Risk	
		Entrenchment Ratio	1.34	0.58				
Geomorphology	Large Woody Debris	LWD Index	396	0.21	0.21	0.58	Functioning At Risk	
	Lateral Migration	Dominant BEHI/NBS	M/L	0.60	0.87			
		Percent Streambank Erosion (%)	0	1.00				
		Percent Streambank Armoring (%)	0	1.00				
	Riparian Vegetation	Buffer Width (ft)	180	1.00	0.79			
		Average DBH (Inches)	7.9	0.66				
		Tree Density (#/Ac)	493.1	0.50				
		Native Shrub/Sapling Density (#/Ac)	269.6	1.00				
		Native Herbaceous Cover (%)	27.5	FALSE				
	Bed Form Diversity	Pool Spacing Ratio	6.78	0.44	0.47			
		Pool Depth Ratio	1.77	0.51				
		Percent Riffle (%)	44.52	0.82				
		Aggradation Ratio	1.52	0.10				
Physicochemical	Temperature	July Mean Temperature (°F)	66.9	1.00	1.00	0.89	Functioning	
	Bacteria	E. Coli (cfu/100 ml)	46.97	0.96	0.96			
	Nutrients	Total Phosphorus (mcg/L)	23	0.58	0.58			
	Dissolved Oxygen	DO Concentration (mg/L)	6.23	1.00	1.00			
Biology	Macroinvertebrates	Macroinvertebrate P51 Index Score	-4	0.28	0.28	0.37	Functioning At Risk	
		Macroinvertebrate P22 Index Score						
	Fish	Fish P51 Index Score	-1	0.45	0.45			

Site Information and Reference Standard Stratification	
Project Name:	White Pine
Reach ID:	10A
Restoration Potential:	NA
Existing Stream Length (ft):	231
Proposed Stream Length (ft):	
Existing Stream Type:	Bc
Proposed/ Reference Stream Type:	Bc
Valley Type:	Unconfined Alluvial
Drainage Area (sq. mi.):	
Strahler Stream Order:	Third
Flow Type:	Perennial
Ecoregion:	Northern Lakes and Forests
Bed Material:	Boulder
Stream Slope (%):	2.2
Stream Temperature:	Warm
Wadeable/Non-wadeable:	Wadeable
Reference Vegetation Community:	Forested

Notes
1. Users input values that are highlighted based on restoration potential
2. Users select values from a pull-down menu
3. Leave values blank for field values that were not measured and/or autopopulate

FUNCTIONAL CHANGE SUMMARY	
Existing Condition Score (ECS)	0.66
Proposed Condition Score (PCS)	
Change in Functional Condition (PCS - ECS)	
Percent Condition Change	
Existing Stream Length (ft)	231
Proposed Stream Length (ft)	
Additional Stream Length (ft)	
Existing Functional Foot Score (FFS)	153
Proposed Functional Foot Score (FFS)	
Proposed FFS - Existing FFS (ΔFF)	
Yield (ΔFF/Proposed LF)	

BMP FUNCTIONAL CHANGE SUMMARY	
Existing BMP Functional Feet Score (FFS)	0
Proposed BMP Functional Feet Score (FFS)	0
Proposed BMP FFS - Existing BMP FFS	0

FUNCTIONAL FEET (FF) SUMMARY	
Existing Stream FFS + Existing BMP FFS	153
Proposed Stream FFS + Proposed BMP FFS	
Total Proposed FFS - Total Existing FFS	
Yield (ΔFF/Proposed LF)	

FUNCTION-BASED PARAMETER SUMMARY			
Functional Category	**Function-Based Parameters**	**Existing Parameter**	**Proposed Parameter**
Hydrology	Reach Runoff	1.00	
Hydraulics	Floodplain Connectivity	0.43	
Geomorphology	Large Woody Debris	0.02	
	Lateral Migration	1.00	
	Riparian Vegetation	0.72	
	Bed Form Diversity	0.79	
Physicochemical	Temperature	1.00	
	Bacteria	0.96	
	Nutrients	0.58	
	Dissolved Oxygen	1.00	
Biology	Macroinvertebrates	0.28	
	Fish	0.45	

FUNCTIONAL CATEGORY REPORT CARD			
Functional Category	**ECS**	**PCS**	**Functional Change**
Hydrology	1.00		
Hydraulics	0.43		
Geomorphology	0.63		
Physicochemical	0.89		
Biology	0.37		

Reach ID:10A

EXISTING CONDITION ASSESSMENT					Roll Up Scoring			
Functional Category	**Function-Based Parameters**	**Metric**	**Field Value**	**Index Value**	**Parameter**	**Category**	**Category**	**Overall**
Hydrology	Reach Runoff	Land Use Change Coefficient	30	1.00	1.00	1.00	Functioning	0.66
		Concentrated Flow Points (#/1000 LF)	0	1.00				
Hydraulics	Floodplain Connectivity	Bank Height Ratio	1.67	0.06	0.43	0.43	Functioning At Risk	
		Entrenchment Ratio	1.67	0.80				
Geomorphology	Large Woody Debris	LWD Index	36	0.02	0.02	0.63	Functioning At Risk	
	Lateral Migration	Dominant BEHI/NBS	L/L	1.00	1.00			
		Percent Streambank Erosion (%)	0	1.00				
		Percent Streambank Armoring (%)	0	1.00				
	Riparian Vegetation	Buffer Width (ft)	55	0.56	0.72			
		Average DBH (Inches)	3.9	0.32				
		Tree Density (#/Ac)	123.3	1.00				
		Native Shrub/Sapling Density (#/Ac)	2033.9	1.00				
		Native Herbaceous Cover (%)	65	FALSE				
	Bed Form Diversity	Pool Spacing Ratio	3.26	1.00	0.79			
		Pool Depth Ratio	2.44	0.83				
		Percent Riffle (%)	62.5	0.92				
		Aggradation Ratio	1.35	0.40				
Physicochemical	Temperature	July Mean Temperature (°F)	66.9	1.00	1.00	0.89	Functioning	
	Bacteria	E. Coli (cfu/100 ml)	46.97	0.96	0.96			
	Nutrients	Total Phosphorus (mcg/L)	23	0.58	0.58			
	Dissolved Oxygen	DO Concentration (mg/L)	6.23	1.00	1.00			
Biology	Macroinvertebrates	Macroinvertebrate P51 Index Score	-4	0.28	0.28	0.37	Functioning At Risk	
		Macroinvertebrate P22 Index Score						
	Fish	Fish P51 Index Score	-1	0.45	0.45			

Site Information and Reference Standard Stratification	
Project Name:	White Pine
Reach ID:	10B
Restoration Potential:	NA
Existing Stream Length (ft):	281
Proposed Stream Length (ft):	
Existing Stream Type:	Bc
Proposed/ Reference Stream Type:	Bc
Valley Type:	Unconfined Alluvial
Drainage Area (sq. mi.):	
Strahler Stream Order:	Third
Flow Type:	Perennial
Ecoregion:	Northern Lakes and Forests
Bed Material:	Sand
Stream Slope (%):	1.1
Stream Temperature:	Warm
Wadeable/Non-wadeable:	Wadeable
Reference Vegetation Community:	Forested

Notes
1. Users input values that are highlighted based on restoration potential
2. Users select values from a pull-down menu
3. Leave values blank for field values that were not measured and/or autopopulate

FUNCTIONAL CHANGE SUMMARY	
Existing Condition Score (ECS)	0.66
Proposed Condition Score (PCS)	
Change in Functional Condition (PCS - ECS)	
Percent Condition Change	
Existing Stream Length (ft)	281
Proposed Stream Length (ft)	
Additional Stream Length (ft)	
Existing Functional Foot Score (FFS)	186
Proposed Functional Foot Score (FFS)	
Proposed FFS - Existing FFS (ΔFF)	
Yield (ΔFF/Proposed LF)	

BMP FUNCTIONAL CHANGE SUMMARY	
Existing BMP Functional Feet Score (FFS)	0
Proposed BMP Functional Feet Score (FFS)	0
Proposed BMP FFS - Existing BMP FFS	0

FUNCTIONAL FEET (FF) SUMMARY	
Existing Stream FFS + Existing BMP FFS	186
Proposed Stream FFS + Proposed BMP FFS	
Total Proposed FFS - Total Existing FFS	
Yield (ΔFF/Proposed LF)	

FUNCTION-BASED PARAMETER SUMMARY			
Functional Category	**Function-Based Parameters**	**Existing Parameter**	**Proposed Parameter**
Hydrology	Reach Runoff	1.00	
Hydraulics	Floodplain Connectivity	0.50	
Geomorphology	Large Woody Debris	0.02	
	Lateral Migration	1.00	
	Riparian Vegetation	0.31	
	Bed Form Diversity	0.83	
Physicochemical	Temperature	1.00	
	Bacteria	0.96	
	Nutrients	0.58	
	Dissolved Oxygen	1.00	
Biology	Macroinvertebrates	0.28	
	Fish	0.45	

FUNCTIONAL CATEGORY REPORT CARD			
Functional Category	**ECS**	**PCS**	**Functional Change**
Hydrology	1.00		
Hydraulics	0.50		
Geomorphology	0.54		
Physicochemical	0.89		
Biology	0.37		

Reach ID:10B

EXISTING CONDITION ASSESSMENT					Roll Up Scoring			
Functional Category	**Function-Based Parameters**	**Metric**	**Field Value**	**Index Value**	**Parameter**	**Category**	**Category**	**Overall**
Hydrology	Reach Runoff	Land Use Change Coefficient	30	1.00	1.00	1.00	Functioning	0.66
		Concentrated Flow Points (#/1000 LF)	0	1.00				
Hydraulics	Floodplain Connectivity	Bank Height Ratio	1.97	0.00	0.50	0.50	Functioning At Risk	
		Entrenchment Ratio	2.45	1.00				
Geomorphology	Large Woody Debris	LWD Index	41	0.02	0.02	0.54	Functioning At Risk	
	Lateral Migration	Dominant BEHI/NBS	L/L	1.00	1.00			
		Percent Streambank Erosion (%)	0	1.00				
		Percent Streambank Armoring (%)	0	1.00				
	Riparian Vegetation	Buffer Width (ft)	20	0.23	0.31			
		Average DBH (Inches)	0	0.00				
		Tree Density (#/Ac)	0	0.00				
		Native Shrub/Sapling Density (#/Ac)	215.7	1.00				
		Native Herbaceous Cover (%)	40	FALSE				
	Bed Form Diversity	Pool Spacing Ratio	2.25	1.00	0.83			
		Pool Depth Ratio	1.53	0.32				
		Percent Riffle (%)	54.39	1.00				
		Aggradation Ratio	0.81	1.00				
Physicochemical	Temperature	July Mean Temperature (°F)	66.9	1.00	1.00	0.89	Functioning	
	Bacteria	E. Coli (cfu/100 ml)	46.97	0.96	0.96			
	Nutrients	Total Phosphorus (mcg/L)	23	0.58	0.58			
	Dissolved Oxygen	DO Concentration (mg/L)	6.23	1.00	1.00			
Biology	Macroinvertebrates	Macroinvertebrate P51 Index Score	-4	0.28	0.28	0.37	Functioning At Risk	
		Macroinvertebrate P22 Index Score						
	Fish	Fish P51 Index Score	-1	0.45	0.45			

Site Information and Reference Standard Stratification	
Project Name:	White Pine
Reach ID:	10c
Restoration Potential:	NA
Existing Stream Length (ft):	1301
Proposed Stream Length (ft):	
Existing Stream Type:	Bc
Proposed/ Reference Stream Type:	Bc
Valley Type:	Unconfined Alluvial
Drainage Area (sq. mi.):	
Strahler Stream Order:	Third
Flow Type:	Perennial
Ecoregion:	Northern Lakes and Forests
Bed Material:	Cobble
Stream Slope (%):	1.5
Stream Temperature:	Warm
Wadeable/Non-wadeable:	Wadeable
Reference Vegetation Community:	Forested

Notes
1. Users input values that are highlighted based on restoration potential
2. Users select values from a pull-down menu
3. Leave values blank for field values that were not measured and/or autopopulate

FUNCTIONAL CHANGE SUMMARY	
Existing Condition Score (ECS)	0.57
Proposed Condition Score (PCS)	
Change in Functional Condition (PCS - ECS)	
Percent Condition Change	
Existing Stream Length (ft)	1301
Proposed Stream Length (ft)	
Additional Stream Length (ft)	
Existing Functional Foot Score (FFS)	742
Proposed Functional Foot Score (FFS)	
Proposed FFS - Existing FFS (ΔFF)	
Yield (ΔFF/Proposed LF)	

BMP FUNCTIONAL CHANGE SUMMARY	
Existing BMP Functional Feet Score (FFS)	0
Proposed BMP Functional Feet Score (FFS)	0
Proposed BMP FFS - Existing BMP FFS	0

FUNCTIONAL FEET (FF) SUMMARY	
Existing Stream FFS + Existing BMP FFS	742
Proposed Stream FFS + Proposed BMP FFS	
Total Proposed FFS - Total Existing FFS	
Yield (ΔFF/Proposed LF)	

FUNCTION-BASED PARAMETER SUMMARY			
Functional Category	**Function-Based Parameters**	**Existing Parameter**	**Proposed Parameter**
Hydrology	Reach Runoff	0.89	
Hydraulics	Floodplain Connectivity	0.08	
Geomorphology	Large Woody Debris	0.19	
	Lateral Migration	0.67	
	Riparian Vegetation	0.81	
	Bed Form Diversity	0.84	
Physicochemical	Temperature	1.00	
	Bacteria	0.96	
	Nutrients	0.58	
	Dissolved Oxygen	1.00	
Biology	Macroinvertebrates	0.28	
	Fish	0.45	

FUNCTIONAL CATEGORY REPORT CARD			
Functional Category	**ECS**	**PCS**	**Functional Change**
Hydrology	0.89		
Hydraulics	0.08		
Geomorphology	0.63		
Physicochemical	0.89		
Biology	0.37		

Reach ID: 10c

EXISTING CONDITION ASSESSMENT					Roll Up Scoring			
Functional Category	**Function-Based Parameters**	**Metric**	**Field Value**	**Index Value**	**Parameter**	**Category**	**Category**	**Overall**
Hydrology	Reach Runoff	Land Use Change Coefficient	30	1.00	0.89	0.89	Functioning	0.57
		Concentrated Flow Points (#/1000 LF)	0.77	0.77				
Hydraulics	Floodplain Connectivity	Bank Height Ratio	2.44	0.00	0.08	0.08	Not Functioning	
		Entrenchment Ratio	1.13	0.16				
Geomorphology	Large Woody Debris	LWD Index	374	0.19	0.19	0.63	Functioning At Risk	
	Lateral Migration	Dominant BEHI/NBS	M/L	0.60	0.67			
		Percent Streambank Erosion (%)	36	0.42				
		Percent Streambank Armoring (%)	0	1.00				
	Riparian Vegetation	Buffer Width (ft)	180	1.00	0.81			
		Average DBH (Inches)	9	0.75				
		Tree Density (#/Ac)	878.3	0.50				
		Native Shrub/Sapling Density (#/Ac)	693.4	1.00				
		Native Herbaceous Cover (%)	0	FALSE				
	Bed Form Diversity	Pool Spacing Ratio	4.64	1.00	0.84			
		Pool Depth Ratio	2.41	0.82				
		Percent Riffle (%)	44	0.80				
		Aggradation Ratio	1.18	0.73				
Physicochemical	Temperature	July Mean Temperature (°F)	66.9	1.00	1.00	0.89	Functioning	
	Bacteria	E. Coli (cfu/100 ml)	46.97	0.96	0.96			
	Nutrients	Total Phosphorus (mcg/L)	23	0.58	0.58			
	Dissolved Oxygen	DO Concentration (mg/L)	6.23	1.00	1.00			
Biology	Macroinvertebrates	Macroinvertebrate P51 Index Score	-4	0.28	0.28	0.37	Functioning At Risk	
		Macroinvertebrate P22 Index Score						
	Fish	Fish P51 Index Score	-1	0.45	0.45			

Site Information and Reference Standard Stratification	
Project Name:	White Pine
Reach ID:	11a
Restoration Potential:	NA
Existing Stream Length (ft):	469
Proposed Stream Length (ft):	
Existing Stream Type:	F
Proposed/ Reference Stream Type:	C
Valley Type:	Unconfined Alluvial
Drainage Area (sq. mi.):	
Strahler Stream Order:	First
Flow Type:	Perennial
Ecoregion:	Northern Lakes and Forests
Bed Material:	Cobble
Stream Slope (%):	1.1
Stream Temperature:	Warm
Wadeable/Non-wadeable:	Wadeable
Reference Vegetation Community:	Forested

Notes
1. Users input values that are highlighted based on restoration potential
2. Users select values from a pull-down menu
3. Leave values blank for field values that were not measured and/or autopopulate

FUNCTIONAL CHANGE SUMMARY	
Existing Condition Score (ECS)	0.54
Proposed Condition Score (PCS)	
Change in Functional Condition (PCS - ECS)	
Percent Condition Change	
Existing Stream Length (ft)	469
Proposed Stream Length (ft)	
Additional Stream Length (ft)	
Existing Functional Foot Score (FFS)	253
Proposed Functional Foot Score (FFS)	
Proposed FFS - Existing FFS (ΔFF)	
Yield (ΔFF/Proposed LF)	

BMP FUNCTIONAL CHANGE SUMMARY	
Existing BMP Functional Feet Score (FFS)	0
Proposed BMP Functional Feet Score (FFS)	0
Proposed BMP FFS - Existing BMP FFS	0

FUNCTIONAL FEET (FF) SUMMARY	
Existing Stream FFS + Existing BMP FFS	253
Proposed Stream FFS + Proposed BMP FFS	
Total Proposed FFS - Total Existing FFS	
Yield (ΔFF/Proposed LF)	

FUNCTION-BASED PARAMETER SUMMARY			
Functional Category	**Function-Based Parameters**	**Existing Parameter**	**Proposed Parameter**
Hydrology	Reach Runoff	1.00	
Hydraulics	Floodplain Connectivity	0.00	
Geomorphology	Large Woody Debris	0.37	
	Lateral Migration	0.51	
	Riparian Vegetation	0.73	
	Bed Form Diversity	0.48	
Physicochemical	Temperature	0.63	
	Bacteria	1.00	
	Nutrients	0.87	
	Dissolved Oxygen	1.00	
Biology	Macroinvertebrates	0.33	
	Fish	0.25	

FUNCTIONAL CATEGORY REPORT CARD			
Functional Category	**ECS**	**PCS**	**Functional Change**
Hydrology	1.00		
Hydraulics	0.00		
Geomorphology	0.52		
Physicochemical	0.88		
Biology	0.29		

Reach ID:11a

EXISTING CONDITION ASSESSMENT					Roll Up Scoring			
Functional Category	**Function-Based Parameters**	**Metric**	**Field Value**	**Index Value**	**Parameter**	**Category**	**Category**	**Overall**
Hydrology	Reach Runoff	Land Use Change Coefficient	30	1.00	1.00	1.00	Functioning	0.54
		Concentrated Flow Points (#/1000 LF)	0	1.00				
Hydraulics	Floodplain Connectivity	Bank Height Ratio	3.39	0.00	0.00	0.00	Not Functioning	
		Entrenchment Ratio	1.3	0.00				
Geomorphology	Large Woody Debris	LWD Index	705	0.37	0.37	0.52	Functioning At Risk	
	Lateral Migration	Dominant BEHI/NBS	H/L	0.40	0.51			
		Percent Streambank Erosion (%)	62	0.14				
		Percent Streambank Armoring (%)	0	1.00				
	Riparian Vegetation	Buffer Width (ft)	180	1.00	0.73			
		Average DBH (Inches)	5	0.42				
		Tree Density (#/Ac)	477.7	0.50				
		Native Shrub/Sapling Density (#/Ac)	385.2	1.00				
		Native Herbaceous Cover (%)	70	FALSE				
	Bed Form Diversity	Pool Spacing Ratio	7.71	0.43	0.48			
		Pool Depth Ratio	1.7	0.46				
		Percent Riffle (%)	80.89	0.21				
		Aggradation Ratio	1.12	0.83				
Physicochemical	Temperature	July Mean Temperature (°F)	74.5	0.63	0.63	0.88	Functioning	
	Bacteria	E. Coli (cfu/100 ml)	11.34	1.00	1.00			
	Nutrients	Total Phosphorus (mcg/L)	7.5	0.87	0.87			
	Dissolved Oxygen	DO Concentration (mg/L)	8.45	1.00	1.00			
Biology	Macroinvertebrates	Macroinvertebrate P51 Index Score	-3	0.33	0.33	0.29	Not Functioning	
		Macroinvertebrate P22 Index Score						
	Fish	Fish P51 Index Score	-5	0.25	0.25			

Site Information and Reference Standard Stratification	
Project Name:	White Pine
Reach ID:	11b
Restoration Potential:	NA
Existing Stream Length (ft):	245
Proposed Stream Length (ft):	
Existing Stream Type:	F
Proposed/ Reference Stream Type:	C
Valley Type:	Unconfined Alluvial
Drainage Area (sq. mi.):	
Strahler Stream Order:	First
Flow Type:	Perennial
Ecoregion:	Northern Lakes and Forests
Bed Material:	Sand
Stream Slope (%):	Impounded
Stream Temperature:	Warm
Wadeable/Non-wadeable:	Wadeable
Reference Vegetation Community:	Forested

Notes
1. Users input values that are highlighted based on restoration potential
2. Users select values from a pull-down menu
3. Leave values blank for field values that were not measured and/or autopopulate

FUNCTIONAL CHANGE SUMMARY	
Existing Condition Score (ECS)	0.51
Proposed Condition Score (PCS)	
Change in Functional Condition (PCS - ECS)	
Percent Condition Change	
Existing Stream Length (ft)	245
Proposed Stream Length (ft)	
Additional Stream Length (ft)	
Existing Functional Foot Score (FFS)	125
Proposed Functional Foot Score (FFS)	
Proposed FFS - Existing FFS (ΔFF)	
Yield (ΔFF/Proposed LF)	

BMP FUNCTIONAL CHANGE SUMMARY	
Existing BMP Functional Feet Score (FFS)	0
Proposed BMP Functional Feet Score (FFS)	0
Proposed BMP FFS - Existing BMP FFS	0

FUNCTIONAL FEET (FF) SUMMARY	
Existing Stream FFS + Existing BMP FFS	125
Proposed Stream FFS + Proposed BMP FFS	
Total Proposed FFS - Total Existing FFS	
Yield (ΔFF/Proposed LF)	

FUNCTION-BASED PARAMETER SUMMARY			
Functional Category	**Function-Based Parameters**	**Existing Parameter**	**Proposed Parameter**
Hydrology	Reach Runoff	1.00	
Hydraulics	Floodplain Connectivity	0.00	
Geomorphology	Large Woody Debris	0.45	
	Lateral Migration	0.50	
	Riparian Vegetation	0.50	
	Bed Form Diversity	0.00	
Physicochemical	Temperature	0.63	
	Bacteria	1.00	
	Nutrients	0.87	
	Dissolved Oxygen	1.00	
Biology	Macroinvertebrates	0.33	
	Fish	0.25	

FUNCTIONAL CATEGORY REPORT CARD			
Functional Category	**ECS**	**PCS**	**Functional Change**
Hydrology	1.00		
Hydraulics	0.00		
Geomorphology	0.36		
Physicochemical	0.88		
Biology	0.29		

Reach ID: 11b

EXISTING CONDITION ASSESSMENT					Roll Up Scoring			
Functional Category	**Function-Based Parameters**	**Metric**	**Field Value**	**Index Value**	**Parameter**	**Category**	**Category**	**Overall**
Hydrology	Reach Runoff	Land Use Change Coefficient	30	1.00	1.00	1.00	Functioning	0.51
		Concentrated Flow Points (#/1000 LF)	0	1.00				
Hydraulics	Floodplain Connectivity	Bank Height Ratio	10	0.00	0.00	0.00	Not Functioning	
		Entrenchment Ratio	0	0.00				
Geomorphology	Large Woody Debris	LWD Index	870	0.45	0.45	0.36	Functioning At Risk	
	Lateral Migration	Dominant BEHI/NBS	H/L	0.40	0.50			
		Percent Streambank Erosion (%)	65	0.11				
		Percent Streambank Armoring (%)	0	1.00				
	Riparian Vegetation	Buffer Width (ft)	180	1.00	0.50			
		Average DBH (Inches)	0	0.00				
		Tree Density (#/Ac)	0	0.00				
		Native Shrub/Sapling Density (#/Ac)	215.7	1.00				
		Native Herbaceous Cover (%)	70	FALSE				
	Bed Form Diversity	Pool Spacing Ratio	0	0.00	0.00			
		Pool Depth Ratio	0	0.00				
		Percent Riffle (%)	0	0.00				
		Aggradation Ratio						
Physicochemical	Temperature	July Mean Temperature (°F)	74.5	0.63	0.63	0.88	Functioning	
	Bacteria	E. Coli (cfu/100 ml)	11.34	1.00	1.00			
	Nutrients	Total Phosphorus (mcg/L)	7.5	0.87	0.87			
	Dissolved Oxygen	DO Concentration (mg/L)	8.45	1.00	1.00			
Biology	Macroinvertebrates	Macroinvertebrate P51 Index Score	-3	0.33	0.33	0.29	Not Functioning	
		Macroinvertebrate P22 Index Score						
	Fish	Fish P51 Index Score	-5	0.25	0.25			

Site Information and Reference Standard Stratification	
Project Name:	White Pine
Reach ID:	25a
Restoration Potential:	NA
Existing Stream Length (ft):	369
Proposed Stream Length (ft):	
Existing Stream Type:	C
Proposed/ Reference Stream Type:	C
Valley Type:	Unconfined Alluvial
Drainage Area (sq. mi.):	
Strahler Stream Order:	Second
Flow Type:	Perennial
Ecoregion:	Northern Lakes and Forests
Bed Material:	Boulder
Stream Slope (%):	2.9
Stream Temperature:	Warm
Wadeable/Non-wadeable:	Wadeable
Reference Vegetation Community:	Scrub-shrub

Notes
1. Users input values that are highlighted based on restoration potential
2. Users select values from a pull-down menu
3. Leave values blank for field values that were not measured and/or autopopulate

FUNCTIONAL CHANGE SUMMARY	
Existing Condition Score (ECS)	0.70
Proposed Condition Score (PCS)	
Change in Functional Condition (PCS - ECS)	
Percent Condition Change	
Existing Stream Length (ft)	369
Proposed Stream Length (ft)	
Additional Stream Length (ft)	
Existing Functional Foot Score (FFS)	258
Proposed Functional Foot Score (FFS)	
Proposed FFS - Existing FFS (ΔFF)	
Yield (ΔFF/Proposed LF)	

BMP FUNCTIONAL CHANGE SUMMARY	
Existing BMP Functional Feet Score (FFS)	0
Proposed BMP Functional Feet Score (FFS)	0
Proposed BMP FFS - Existing BMP FFS	0

FUNCTIONAL FEET (FF) SUMMARY	
Existing Stream FFS + Existing BMP FFS	258
Proposed Stream FFS + Proposed BMP FFS	
Total Proposed FFS - Total Existing FFS	
Yield (ΔFF/Proposed LF)	

FUNCTION-BASED PARAMETER SUMMARY			
Functional Category	**Function-Based Parameters**	**Existing Parameter**	**Proposed Parameter**
Hydrology	Reach Runoff	1.00	
Hydraulics	Floodplain Connectivity	0.84	
Geomorphology	Large Woody Debris	0.02	
	Lateral Migration	0.56	
	Riparian Vegetation	1.00	
	Bed Form Diversity	0.75	
Physicochemical	Temperature	1.00	
	Bacteria	0.77	
	Nutrients	0.62	
	Dissolved Oxygen	0.06	
Biology	Macroinvertebrates	0.44	
	Fish	0.45	

FUNCTIONAL CATEGORY REPORT CARD			
Functional Category	**ECS**	**PCS**	**Functional Change**
Hydrology	1.00		
Hydraulics	0.84		
Geomorphology	0.58		
Physicochemical	0.61		
Biology	0.45		

Reach ID: 25a

EXISTING CONDITION ASSESSMENT					Roll Up Scoring			
Functional Category	**Function-Based Parameters**	**Metric**	**Field Value**	**Index Value**	**Parameter**	**Category**	**Category**	**Overall**
Hydrology	Reach Runoff	Land Use Change Coefficient	30	1.00	1.00	1.00	Functioning	0.70
		Concentrated Flow Points (#/1000 LF)	0	1.00				
Hydraulics	Floodplain Connectivity	Bank Height Ratio	1.05	0.93	0.84	0.84	Functioning	
		Entrenchment Ratio	2.76	0.74				
Geomorphology	Large Woody Debris	LWD Index	40	0.02	0.02	0.58	Functioning At Risk	
	Lateral Migration	Dominant BEHI/NBS	Ex/H	0.00	0.56			
		Percent Streambank Erosion (%)	13	0.67				
		Percent Streambank Armoring (%)	0	1.00				
	Riparian Vegetation	Buffer Width (ft)	180	1.00	1.00			
		Average DBH (Inches)	5.8	FALSE				
		Tree Density (#/Ac)	123.3	FALSE				
		Native Shrub/Sapling Density (#/Ac)	3050.8	1.00				
		Native Herbaceous Cover (%)	70	FALSE				
	Bed Form Diversity	Pool Spacing Ratio	2.52	0.61	0.75			
		Pool Depth Ratio	1.97	0.68				
		Percent Riffle (%)	56.09	1.00				
		Aggradation Ratio	1.19	0.71				
Physicochemical	Temperature	July Mean Temperature (°F)	67.1	1.00	1.00	0.61	Functioning At Risk	
	Bacteria	E. Coli (cfu/100 ml)	220.44	0.77	0.77			
	Nutrients	Total Phosphorus (mcg/L)	20	0.62	0.62			
	Dissolved Oxygen	DO Concentration (mg/L)	3.4	0.06	0.06			
Biology	Macroinvertebrates	Macroinvertebrate P51 Index Score	-1	0.44	0.44	0.45	Functioning At Risk	
		Macroinvertebrate P22 Index Score						
	Fish	Fish P51 Index Score	-1	0.45	0.45			

Site Information and Reference Standard Stratification	
Project Name:	White Pine
Reach ID:	25b
Restoration Potential:	NA
Existing Stream Length (ft):	716
Proposed Stream Length (ft):	
Existing Stream Type:	C
Proposed/ Reference Stream Type:	C
Valley Type:	Unconfined Alluvial
Drainage Area (sq. mi.):	
Strahler Stream Order:	Second
Flow Type:	Perennial
Ecoregion:	Northern Lakes and Forests
Bed Material:	Sand
Stream Slope (%):	Impounded
Stream Temperature:	Warm
Wadeable/Non-wadeable:	Wadeable
Reference Vegetation Community:	Scrub-shrub

Notes
1. Users input values that are highlighted based on restoration potential
2. Users select values from a pull-down menu
3. Leave values blank for field values that were not measured and/or autopopulate

FUNCTIONAL CHANGE SUMMARY	
Existing Condition Score (ECS)	0.51
Proposed Condition Score (PCS)	
Change in Functional Condition (PCS - ECS)	
Percent Condition Change	
Existing Stream Length (ft)	716
Proposed Stream Length (ft)	
Additional Stream Length (ft)	
Existing Functional Foot Score (FFS)	365
Proposed Functional Foot Score (FFS)	
Proposed FFS - Existing FFS (ΔFF)	
Yield (ΔFF/Proposed LF)	

BMP FUNCTIONAL CHANGE SUMMARY	
Existing BMP Functional Feet Score (FFS)	0
Proposed BMP Functional Feet Score (FFS)	0
Proposed BMP FFS - Existing BMP FFS	0

FUNCTIONAL FEET (FF) SUMMARY	
Existing Stream FFS + Existing BMP FFS	365
Proposed Stream FFS + Proposed BMP FFS	
Total Proposed FFS - Total Existing FFS	
Yield (ΔFF/Proposed LF)	

FUNCTION-BASED PARAMETER SUMMARY			
Functional Category	**Function-Based Parameters**	**Existing Parameter**	**Proposed Parameter**
Hydrology	Reach Runoff	1.00	
Hydraulics	Floodplain Connectivity	0.00	
Geomorphology	Large Woody Debris	0.00	
	Lateral Migration	1.00	
	Riparian Vegetation	1.00	
	Bed Form Diversity	0.00	
Physicochemical	Temperature	1.00	
	Bacteria	0.77	
	Nutrients	0.62	
	Dissolved Oxygen	0.06	
Biology	Macroinvertebrates	0.44	
	Fish	0.45	

FUNCTIONAL CATEGORY REPORT CARD			
Functional Category	**ECS**	**PCS**	**Functional Change**
Hydrology	1.00		
Hydraulics	0.00		
Geomorphology	0.50		
Physicochemical	0.61		
Biology	0.45		

Reach ID: 25b

EXISTING CONDITION ASSESSMENT					Roll Up Scoring			
Functional Category	**Function-Based Parameters**	**Metric**	**Field Value**	**Index Value**	**Parameter**	**Category**	**Category**	**Overall**
Hydrology	Reach Runoff	Land Use Change Coefficient	30	1.00	1.00	1.00	Functioning	0.51
		Concentrated Flow Points (#/1000 LF)	0	1.00				
Hydraulics	Floodplain Connectivity	Bank Height Ratio	10	0.00	0.00	0.00	Not Functioning	
		Entrenchment Ratio	0	0.00				
Geomorphology	Large Woody Debris	LWD Index	0	0.00	0.00	0.50	Functioning At Risk	
	Lateral Migration	Dominant BEHI/NBS	L/L	1.00	1.00			
		Percent Streambank Erosion (%)	0	1.00				
		Percent Streambank Armoring (%)	0	1.00				
	Riparian Vegetation	Buffer Width (ft)	180	1.00	1.00			
		Average DBH (Inches)	6.4	FALSE				
		Tree Density (#/Ac)	66.3	FALSE				
		Native Shrub/Sapling Density (#/Ac)	1448.4	1.00				
		Native Herbaceous Cover (%)	43.3	FALSE				
	Bed Form Diversity	Pool Spacing Ratio	0	0.00	0.00			
		Pool Depth Ratio	0	0.00				
		Percent Riffle (%)	0	0.00				
		Aggradation Ratio						
Physicochemical	Temperature	July Mean Temperature (°F)	67.1	1.00	1.00	0.61	Functioning At Risk	
	Bacteria	E. Coli (cfu/100 ml)	220.44	0.77	0.77			
	Nutrients	Total Phosphorus (mcg/L)	20	0.62	0.62			
	Dissolved Oxygen	DO Concentration (mg/L)	3.4	0.06	0.06			
Biology	Macroinvertebrates	Macroinvertebrate P51 Index Score	-1	0.44	0.44	0.45	Functioning At Risk	
		Macroinvertebrate P22 Index Score						
	Fish	Fish P51 Index Score	-1	0.45	0.45			

Site Information and Reference Standard Stratification	
Project Name:	White Pine
Reach ID:	25c
Restoration Potential:	NA
Existing Stream Length (ft):	316
Proposed Stream Length (ft):	
Existing Stream Type:	C
Proposed/ Reference Stream Type:	C
Valley Type:	Unconfined Alluvial
Drainage Area (sq. mi.):	
Strahler Stream Order:	Second
Flow Type:	Perennial
Ecoregion:	Northern Lakes and Forests
Bed Material:	Bedrock
Stream Slope (%):	1.2
Stream Temperature:	Warm
Wadeable/Non-wadeable:	Wadeable
Reference Vegetation Community:	Scrub-shrub

Notes
1. Users input values that are highlighted based on restoration potential
2. Users select values from a pull-down menu
3. Leave values blank for field values that were not measured and/or autopopulate

FUNCTIONAL CHANGE SUMMARY	
Existing Condition Score (ECS)	0.53
Proposed Condition Score (PCS)	
Change in Functional Condition (PCS - ECS)	
Percent Condition Change	
Existing Stream Length (ft)	316
Proposed Stream Length (ft)	
Additional Stream Length (ft)	
Existing Functional Foot Score (FFS)	168
Proposed Functional Foot Score (FFS)	
Proposed FFS - Existing FFS (ΔFF)	
Yield (ΔFF/Proposed LF)	

BMP FUNCTIONAL CHANGE SUMMARY	
Existing BMP Functional Feet Score (FFS)	0
Proposed BMP Functional Feet Score (FFS)	0
Proposed BMP FFS - Existing BMP FFS	0

FUNCTIONAL FEET (FF) SUMMARY	
Existing Stream FFS + Existing BMP FFS	168
Proposed Stream FFS + Proposed BMP FFS	
Total Proposed FFS - Total Existing FFS	
Yield (ΔFF/Proposed LF)	

FUNCTION-BASED PARAMETER SUMMARY			
Functional Category	**Function-Based Parameters**	**Existing Parameter**	**Proposed Parameter**
Hydrology	Reach Runoff	1.00	
Hydraulics	Floodplain Connectivity	0.00	
Geomorphology	Large Woody Debris	0.08	
	Lateral Migration	0.59	
	Riparian Vegetation	1.00	
	Bed Form Diversity	0.70	
Physicochemical	Temperature	1.00	
	Bacteria	0.77	
	Nutrients	0.62	
	Dissolved Oxygen	0.06	
Biology	Macroinvertebrates	0.44	
	Fish	0.45	

FUNCTIONAL CATEGORY REPORT CARD			
Functional Category	**ECS**	**PCS**	**Functional Change**
Hydrology	1.00		
Hydraulics	0.00		
Geomorphology	0.59		
Physicochemical	0.61		
Biology	0.45		

Reach ID: 25c

EXISTING CONDITION ASSESSMENT					Roll Up Scoring			
Functional Category	**Function-Based Parameters**	**Metric**	**Field Value**	**Index Value**	**Parameter**	**Category**	**Category**	**Overall**
Hydrology	Reach Runoff	Land Use Change Coefficient	30	1.00	1.00	1.00	Functioning	0.53
		Concentrated Flow Points (#/1000 LF)	0	1.00				
Hydraulics	Floodplain Connectivity	Bank Height Ratio	2.13	0.00	0.00	0.00	Not Functioning	
		Entrenchment Ratio	1.19	0.00				
Geomorphology	Large Woody Debris	LWD Index	152	0.08	0.08	0.59	Functioning At Risk	
	Lateral Migration	Dominant BEHI/NBS	H/M	0.20	0.59			
		Percent Streambank Erosion (%)	21	0.58				
		Percent Streambank Armoring (%)	0	1.00				
	Riparian Vegetation	Buffer Width (ft)	180	1.00	1.00			
		Average DBH (Inches)	7.5	FALSE				
		Tree Density (#/Ac)	107.9	FALSE				
		Native Shrub/Sapling Density (#/Ac)	1694.9	1.00				
		Native Herbaceous Cover (%)	65	FALSE				
	Bed Form Diversity	Pool Spacing Ratio	2.76	0.70	0.70			
		Pool Depth Ratio	2.07	0.72				
		Percent Riffle (%)	38.87	0.75				
		Aggradation Ratio	1.24	0.61				
Physicochemical	Temperature	July Mean Temperature (°F)	67.1	1.00	1.00	0.61	Functioning At Risk	
	Bacteria	E. Coli (cfu/100 ml)	220.44	0.77	0.77			
	Nutrients	Total Phosphorus (mcg/L)	20	0.62	0.62			
	Dissolved Oxygen	DO Concentration (mg/L)	3.4	0.06	0.06			
Biology	Macroinvertebrates	Macroinvertebrate P51 Index Score	-1	0.44	0.44	0.45	Functioning At Risk	
		Macroinvertebrate P22 Index Score						
	Fish	Fish P51 Index Score	-1	0.45	0.45			

Site Information and Reference Standard Stratification	
Project Name:	White Pine
Reach ID:	25d
Restoration Potential:	NA
Existing Stream Length (ft):	417
Proposed Stream Length (ft):	
Existing Stream Type:	C
Proposed/ Reference Stream Type:	C
Valley Type:	Unconfined Alluvial
Drainage Area (sq. mi.):	
Strahler Stream Order:	Second
Flow Type:	Perennial
Ecoregion:	Northern Lakes and Forests
Bed Material:	Bedrock
Stream Slope (%):	0.9
Stream Temperature:	Warm
Wadeable/Non-wadeable:	Wadeable
Reference Vegetation Community:	Forested

Notes
1. Users input values that are highlighted based on restoration potential
2. Users select values from a pull-down menu
3. Leave values blank for field values that were not measured and/or autopopulate

FUNCTIONAL CHANGE SUMMARY	
Existing Condition Score (ECS)	0.62
Proposed Condition Score (PCS)	
Change in Functional Condition (PCS - ECS)	
Percent Condition Change	
Existing Stream Length (ft)	417
Proposed Stream Length (ft)	
Additional Stream Length (ft)	
Existing Functional Foot Score (FFS)	259
Proposed Functional Foot Score (FFS)	
Proposed FFS - Existing FFS (ΔFF)	
Yield (ΔFF/Proposed LF)	

BMP FUNCTIONAL CHANGE SUMMARY	
Existing BMP Functional Feet Score (FFS)	0
Proposed BMP Functional Feet Score (FFS)	0
Proposed BMP FFS - Existing BMP FFS	0

FUNCTIONAL FEET (FF) SUMMARY	
Existing Stream FFS + Existing BMP FFS	259
Proposed Stream FFS + Proposed BMP FFS	
Total Proposed FFS - Total Existing FFS	
Yield (ΔFF/Proposed LF)	

FUNCTION-BASED PARAMETER SUMMARY			
Functional Category	**Function-Based Parameters**	**Existing Parameter**	**Proposed Parameter**
Hydrology	Reach Runoff	1.00	
Hydraulics	Floodplain Connectivity	0.50	
Geomorphology	Large Woody Debris	0.25	
	Lateral Migration	0.54	
	Riparian Vegetation	0.78	
	Bed Form Diversity	0.64	
Physicochemical	Temperature	1.00	
	Bacteria	0.77	
	Nutrients	0.62	
	Dissolved Oxygen	0.06	
Biology	Macroinvertebrates	0.44	
	Fish	0.45	

FUNCTIONAL CATEGORY REPORT CARD			
Functional Category	**ECS**	**PCS**	**Functional Change**
Hydrology	1.00		
Hydraulics	0.50		
Geomorphology	0.55		
Physicochemical	0.61		
Biology	0.45		

Reach ID: 25d

EXISTING CONDITION ASSESSMENT					Roll Up Scoring			
Functional Category	**Function-Based Parameters**	**Metric**	**Field Value**	**Index Value**	**Parameter**	**Category**	**Category**	**Overall**
Hydrology	Reach Runoff	Land Use Change Coefficient	30	1.00	1.00	1.00	Functioning	0.62
		Concentrated Flow Points (#/1000 LF)	0	1.00				
Hydraulics	Floodplain Connectivity	Bank Height Ratio	1.89	0.00	0.50	0.50	Functioning At Risk	
		Entrenchment Ratio	5.9	1.00				
Geomorphology	Large Woody Debris	LWD Index	489	0.25	0.25	0.55	Functioning At Risk	
	Lateral Migration	Dominant BEHI/NBS	M/VH	0.20	0.54			
		Percent Streambank Erosion (%)	35	0.43				
		Percent Streambank Armoring (%)	0	1.00				
	Riparian Vegetation	Buffer Width (ft)	180	1.00	0.78			
		Average DBH (Inches)	7.2	0.60				
		Tree Density (#/Ac)	400.6	0.50				
		Native Shrub/Sapling Density (#/Ac)	678	1.00				
		Native Herbaceous Cover (%)	30	FALSE				
	Bed Form Diversity	Pool Spacing Ratio	2.48	0.59	0.64			
		Pool Depth Ratio	2.12	0.74				
		Percent Riffle (%)	33.33	0.53				
		Aggradation Ratio	1.19	0.71				
Physicochemical	Temperature	July Mean Temperature (°F)	67.1	1.00	1.00	0.61	Functioning At Risk	
	Bacteria	E. Coli (cfu/100 ml)	220.44	0.77	0.77			
	Nutrients	Total Phosphorus (mcg/L)	20	0.62	0.62			
	Dissolved Oxygen	DO Concentration (mg/L)	3.4	0.06	0.06			
Biology	Macroinvertebrates	Macroinvertebrate P51 Index Score	-1	0.44	0.44	0.45	Functioning At Risk	
		Macroinvertebrate P22 Index Score						
	Fish	Fish P51 Index Score	-1	0.45	0.45			

Site Information and Reference Standard Stratification	
Project Name:	White Pine
Reach ID:	25e
Restoration Potential:	NA
Existing Stream Length (ft):	1310
Proposed Stream Length (ft):	
Existing Stream Type:	C
Proposed/ Reference Stream Type:	C
Valley Type:	Unconfined Alluvial
Drainage Area (sq. mi.):	
Strahler Stream Order:	Second
Flow Type:	Perennial
Ecoregion:	Northern Lakes and Forests
Bed Material:	Bedrock
Stream Slope (%):	0.9
Stream Temperature:	Warm
Wadeable/Non-wadeable:	Wadeable
Reference Vegetation Community:	Scrub-shrub

Notes
1. Users input values that are highlighted based on restoration potential
2. Users select values from a pull-down menu
3. Leave values blank for field values that were not measured and/or autopopulate

FUNCTIONAL CHANGE SUMMARY	
Existing Condition Score (ECS)	0.71
Proposed Condition Score (PCS)	
Change in Functional Condition (PCS - ECS)	
Percent Condition Change	
Existing Stream Length (ft)	1310
Proposed Stream Length (ft)	
Additional Stream Length (ft)	
Existing Functional Foot Score (FFS)	930
Proposed Functional Foot Score (FFS)	
Proposed FFS - Existing FFS (ΔFF)	
Yield (ΔFF/Proposed LF)	

BMP FUNCTIONAL CHANGE SUMMARY	
Existing BMP Functional Feet Score (FFS)	0
Proposed BMP Functional Feet Score (FFS)	0
Proposed BMP FFS - Existing BMP FFS	0

FUNCTIONAL FEET (FF) SUMMARY	
Existing Stream FFS + Existing BMP FFS	930
Proposed Stream FFS + Proposed BMP FFS	
Total Proposed FFS - Total Existing FFS	
Yield (ΔFF/Proposed LF)	

FUNCTION-BASED PARAMETER SUMMARY			
Functional Category	**Function-Based Parameters**	**Existing Parameter**	**Proposed Parameter**
Hydrology	Reach Runoff	1.00	
Hydraulics	Floodplain Connectivity	0.84	
Geomorphology	Large Woody Debris	0.24	
	Lateral Migration	0.49	
	Riparian Vegetation	1.00	
	Bed Form Diversity	0.81	
Physicochemical	Temperature	1.00	
	Bacteria	0.77	
	Nutrients	0.62	
	Dissolved Oxygen	0.06	
Biology	Macroinvertebrates	0.44	
	Fish	0.45	

FUNCTIONAL CATEGORY REPORT CARD			
Functional Category	**ECS**	**PCS**	**Functional Change**
Hydrology	1.00		
Hydraulics	0.84		
Geomorphology	0.63		
Physicochemical	0.61		
Biology	0.45		

Reach ID: 25e

EXISTING CONDITION ASSESSMENT					Roll Up Scoring			
Functional Category	**Function-Based Parameters**	**Metric**	**Field Value**	**Index Value**	**Parameter**	**Category**	**Category**	**Overall**
Hydrology	Reach Runoff	Land Use Change Coefficient	30	1.00	1.00	1.00	Functioning	0.71
		Concentrated Flow Points (#/1000 LF)	0	1.00				
Hydraulics	Floodplain Connectivity	Bank Height Ratio	1.16	0.78	0.84	0.84	Functioning	
		Entrenchment Ratio	4.08	0.89				
Geomorphology	Large Woody Debris	LWD Index	461	0.24	0.24	0.63	Functioning At Risk	
	Lateral Migration	Dominant BEHI/NBS	H/VH	0.00	0.49			
		Percent Streambank Erosion (%)	31	0.47				
		Percent Streambank Armoring (%)	0	1.00				
	Riparian Vegetation	Buffer Width (ft)	180	1.00	1.00			
		Average DBH (Inches)	8.4	FALSE				
		Tree Density (#/Ac)	15.4	FALSE				
		Native Shrub/Sapling Density (#/Ac)	5200	1.00				
		Native Herbaceous Cover (%)	90	FALSE				
	Bed Form Diversity	Pool Spacing Ratio	2.56	0.62	0.81			
		Pool Depth Ratio	2.14	0.74				
		Percent Riffle (%)	45.91	1.00				
		Aggradation Ratio	1.1	0.87				
Physicochemical	Temperature	July Mean Temperature (°F)	67.1	1.00	1.00	0.61	Functioning At Risk	
	Bacteria	E. Coli (cfu/100 ml)	220.44	0.77	0.77			
	Nutrients	Total Phosphorus (mcg/L)	20	0.62	0.62			
	Dissolved Oxygen	DO Concentration (mg/L)	3.4	0.06	0.06			
Biology	Macroinvertebrates	Macroinvertebrate P51 Index Score	-1	0.44	0.44	0.45	Functioning At Risk	
		Macroinvertebrate P22 Index Score						
	Fish	Fish P51 Index Score	-1	0.45	0.45			

Site Information and Reference Standard Stratification	
Project Name:	White Pine
Reach ID:	25g
Restoration Potential:	NA
Existing Stream Length (ft):	1182
Proposed Stream Length (ft):	
Existing Stream Type:	C
Proposed/ Reference Stream Type:	C
Valley Type:	Unconfined Alluvial
Drainage Area (sq. mi.):	
Strahler Stream Order:	Second
Flow Type:	Perennial
Ecoregion:	Northern Lakes and Forests
Bed Material:	Sand
Stream Slope (%):	1.3
Stream Temperature:	Warm
Wadeable/Non-wadeable:	Wadeable
Reference Vegetation Community:	Forested

Notes
1. Users input values that are highlighted based on restoration potential
2. Users select values from a pull-down menu
3. Leave values blank for field values that were not measured and/or autopopulate

FUNCTIONAL CHANGE SUMMARY	
Existing Condition Score (ECS)	0.57
Proposed Condition Score (PCS)	
Change in Functional Condition (PCS - ECS)	
Percent Condition Change	
Existing Stream Length (ft)	1182
Proposed Stream Length (ft)	
Additional Stream Length (ft)	
Existing Functional Foot Score (FFS)	674
Proposed Functional Foot Score (FFS)	
Proposed FFS - Existing FFS (ΔFF)	
Yield (ΔFF/Proposed LF)	

BMP FUNCTIONAL CHANGE SUMMARY	
Existing BMP Functional Feet Score (FFS)	0
Proposed BMP Functional Feet Score (FFS)	0
Proposed BMP FFS - Existing BMP FFS	0

FUNCTIONAL FEET (FF) SUMMARY	
Existing Stream FFS + Existing BMP FFS	674
Proposed Stream FFS + Proposed BMP FFS	
Total Proposed FFS - Total Existing FFS	
Yield (ΔFF/Proposed LF)	

FUNCTION-BASED PARAMETER SUMMARY			
Functional Category	**Function-Based Parameters**	**Existing Parameter**	**Proposed Parameter**
Hydrology	Reach Runoff	1.00	
Hydraulics	Floodplain Connectivity	0.00	
Geomorphology	Large Woody Debris	0.76	
	Lateral Migration	1.00	
	Riparian Vegetation	0.91	
	Bed Form Diversity	0.56	
Physicochemical	Temperature	1.00	
	Bacteria	0.77	
	Nutrients	0.62	
	Dissolved Oxygen	0.06	
Biology	Macroinvertebrates	0.44	
	Fish	0.45	

FUNCTIONAL CATEGORY REPORT CARD			
Functional Category	**ECS**	**PCS**	**Functional Change**
Hydrology	1.00		
Hydraulics	0.00		
Geomorphology	0.81		
Physicochemical	0.61		
Biology	0.45		

Reach ID: 25g

EXISTING CONDITION ASSESSMENT					Roll Up Scoring			
Functional Category	**Function-Based Parameters**	**Metric**	**Field Value**	**Index Value**	**Parameter**	**Category**	**Category**	**Overall**
Hydrology	Reach Runoff	Land Use Change Coefficient	30	1.00	1.00	1.00	Functioning	0.57
		Concentrated Flow Points (#/1000 LF)	0	1.00				
Hydraulics	Floodplain Connectivity	Bank Height Ratio	2.06	0.00	0.00	0.00	Not Functioning	
		Entrenchment Ratio	1.46	0.00				
Geomorphology	Large Woody Debris	LWD Index	1624	0.76	0.76	0.81	Functioning	
	Lateral Migration	Dominant BEHI/NBS	L/L	1.00	1.00			
		Percent Streambank Erosion (%)	0	1.00				
		Percent Streambank Armoring (%)	0	1.00				
	Riparian Vegetation	Buffer Width (ft)	180	1.00	0.91			
		Average DBH (Inches)	7.5	0.62				
		Tree Density (#/Ac)	200.3	1.00				
		Native Shrub/Sapling Density (#/Ac)	523.9	1.00				
		Native Herbaceous Cover (%)	65	FALSE				
	Bed Form Diversity	Pool Spacing Ratio	2.87	0.75	0.56			
		Pool Depth Ratio	1.83	0.56				
		Percent Riffle (%)	30.22	0.41				
		Aggradation Ratio	1.28	0.53				
Physicochemical	Temperature	July Mean Temperature (°F)	67.1	1.00	1.00	0.61	Functioning At Risk	
	Bacteria	E. Coli (cfu/100 ml)	220.44	0.77	0.77			
	Nutrients	Total Phosphorus (mcg/L)	20	0.62	0.62			
	Dissolved Oxygen	DO Concentration (mg/L)	3.4	0.06	0.06			
Biology	Macroinvertebrates	Macroinvertebrate P51 Index Score	-1	0.44	0.44	0.45	Functioning At Risk	
		Macroinvertebrate P22 Index Score						
	Fish	Fish P51 Index Score	-1	0.45	0.45			

Site Information and Reference Standard Stratification	
Project Name:	White Pine
Reach ID:	25h
Restoration Potential:	NA
Existing Stream Length (ft):	1911
Proposed Stream Length (ft):	
Existing Stream Type:	C
Proposed/ Reference Stream Type:	C
Valley Type:	Unconfined Alluvial
Drainage Area (sq. mi.):	
Strahler Stream Order:	Second
Flow Type:	Perennial
Ecoregion:	Northern Lakes and Forests
Bed Material:	Cobble
Stream Slope (%):	0.6
Stream Temperature:	Warm
Wadeable/Non-wadeable:	Wadeable
Reference Vegetation Community:	Forested

Notes
1. Users input values that are highlighted based on restoration potential
2. Users select values from a pull-down menu
3. Leave values blank for field values that were not measured and/or autopopulate

FUNCTIONAL CHANGE SUMMARY	
Existing Condition Score (ECS)	0.60
Proposed Condition Score (PCS)	
Change in Functional Condition (PCS - ECS)	
Percent Condition Change	
Existing Stream Length (ft)	1911
Proposed Stream Length (ft)	
Additional Stream Length (ft)	
Existing Functional Foot Score (FFS)	1147
Proposed Functional Foot Score (FFS)	
Proposed FFS - Existing FFS (ΔFF)	
Yield (ΔFF/Proposed LF)	

BMP FUNCTIONAL CHANGE SUMMARY	
Existing BMP Functional Feet Score (FFS)	0
Proposed BMP Functional Feet Score (FFS)	0
Proposed BMP FFS - Existing BMP FFS	0

FUNCTIONAL FEET (FF) SUMMARY	
Existing Stream FFS + Existing BMP FFS	1147
Proposed Stream FFS + Proposed BMP FFS	
Total Proposed FFS - Total Existing FFS	
Yield (ΔFF/Proposed LF)	

FUNCTION-BASED PARAMETER SUMMARY			
Functional Category	**Function-Based Parameters**	**Existing Parameter**	**Proposed Parameter**
Hydrology	Reach Runoff	1.00	
Hydraulics	Floodplain Connectivity	0.36	
Geomorphology	Large Woody Debris	0.08	
	Lateral Migration	0.63	
	Riparian Vegetation	0.84	
	Bed Form Diversity	0.80	
Physicochemical	Temperature	1.00	
	Bacteria	0.77	
	Nutrients	0.62	
	Dissolved Oxygen	0.06	
Biology	Macroinvertebrates	0.44	
	Fish	0.45	

FUNCTIONAL CATEGORY REPORT CARD			
Functional Category	**ECS**	**PCS**	**Functional Change**
Hydrology	1.00		
Hydraulics	0.36		
Geomorphology	0.59		
Physicochemical	0.61		
Biology	0.45		

Reach ID: 25h

EXISTING CONDITION ASSESSMENT					Roll Up Scoring			
Functional Category	**Function-Based Parameters**	**Metric**	**Field Value**	**Index Value**	**Parameter**	**Category**	**Category**	**Overall**
Hydrology	Reach Runoff	Land Use Change Coefficient	30	1.00	1.00	1.00	Functioning	0.60
		Concentrated Flow Points (#/1000 LF)	0	1.00				
Hydraulics	Floodplain Connectivity	Bank Height Ratio	1.65	0.09	0.36	0.36	Functioning At Risk	
		Entrenchment Ratio	2.32	0.62				
Geomorphology	Large Woody Debris	LWD Index	146	0.08	0.08	0.59	Functioning At Risk	
	Lateral Migration	Dominant BEHI/NBS	M/H	0.30	0.63			
		Percent Streambank Erosion (%)	21	0.58				
		Percent Streambank Armoring (%)	0	1.00				
	Riparian Vegetation	Buffer Width (ft)	180	1.00	0.84			
		Average DBH (Inches)	10.3	0.86				
		Tree Density (#/Ac)	724.2	0.50				
		Native Shrub/Sapling Density (#/Ac)	277.3	1.00				
		Native Herbaceous Cover (%)	60	FALSE				
	Bed Form Diversity	Pool Spacing Ratio	4.11	1.00	0.80			
		Pool Depth Ratio	1.58	0.36				
		Percent Riffle (%)	42.22	0.89				
		Aggradation Ratio	1.06	0.93				
Physicochemical	Temperature	July Mean Temperature (°F)	67.1	1.00	1.00	0.61	Functioning At Risk	
	Bacteria	E. Coli (cfu/100 ml)	220.44	0.77	0.77			
	Nutrients	Total Phosphorus (mcg/L)	20	0.62	0.62			
	Dissolved Oxygen	DO Concentration (mg/L)	3.4	0.06	0.06			
Biology	Macroinvertebrates	Macroinvertebrate P51 Index Score	-1	0.44	0.44	0.45	Functioning At Risk	
		Macroinvertebrate P22 Index Score						
	Fish	Fish P51 Index Score	-1	0.45	0.45			

Site Information and Reference Standard Stratification	
Project Name:	White Pine
Reach ID:	25i
Restoration Potential:	NA
Existing Stream Length (ft):	1142
Proposed Stream Length (ft):	
Existing Stream Type:	C
Proposed/ Reference Stream Type:	C
Valley Type:	Unconfined Alluvial
Drainage Area (sq. mi.):	
Strahler Stream Order:	Second
Flow Type:	Perennial
Ecoregion:	Northern Lakes and Forests
Bed Material:	Sand
Stream Slope (%):	0.7
Stream Temperature:	Warm
Wadeable/Non-wadeable:	Wadeable
Reference Vegetation Community:	Forested

Notes
1. Users input values that are highlighted based on restoration potential
2. Users select values from a pull-down menu
3. Leave values blank for field values that were not measured and/or autopopulate

FUNCTIONAL CHANGE SUMMARY	
Existing Condition Score (ECS)	0.55
Proposed Condition Score (PCS)	
Change in Functional Condition (PCS - ECS)	
Percent Condition Change	
Existing Stream Length (ft)	1142
Proposed Stream Length (ft)	
Additional Stream Length (ft)	
Existing Functional Foot Score (FFS)	628
Proposed Functional Foot Score (FFS)	
Proposed FFS - Existing FFS (ΔFF)	
Yield (ΔFF/Proposed LF)	

BMP FUNCTIONAL CHANGE SUMMARY	
Existing BMP Functional Feet Score (FFS)	0
Proposed BMP Functional Feet Score (FFS)	0
Proposed BMP FFS - Existing BMP FFS	0

FUNCTIONAL FEET (FF) SUMMARY	
Existing Stream FFS + Existing BMP FFS	628
Proposed Stream FFS + Proposed BMP FFS	
Total Proposed FFS - Total Existing FFS	
Yield (ΔFF/Proposed LF)	

FUNCTION-BASED PARAMETER SUMMARY			
Functional Category	**Function-Based Parameters**	**Existing Parameter**	**Proposed Parameter**
Hydrology	Reach Runoff	1.00	
Hydraulics	Floodplain Connectivity	0.00	
Geomorphology	Large Woody Debris	0.65	
	Lateral Migration	0.59	
	Riparian Vegetation	0.88	
	Bed Form Diversity	0.59	
Physicochemical	Temperature	1.00	
	Bacteria	0.77	
	Nutrients	0.62	
	Dissolved Oxygen	0.06	
Biology	Macroinvertebrates	0.44	
	Fish	0.45	

FUNCTIONAL CATEGORY REPORT CARD			
Functional Category	**ECS**	**PCS**	**Functional Change**
Hydrology	1.00		
Hydraulics	0.00		
Geomorphology	0.68		
Physicochemical	0.61		
Biology	0.45		

Reach ID: 25i

EXISTING CONDITION ASSESSMENT					Roll Up Scoring			
Functional Category	**Function-Based Parameters**	**Metric**	**Field Value**	**Index Value**	**Parameter**	**Category**	**Category**	**Overall**
Hydrology	Reach Runoff	Land Use Change Coefficient	30	1.00	1.00	1.00	Functioning	0.55
		Concentrated Flow Points (#/1000 LF)	0	1.00				
Hydraulics	Floodplain Connectivity	Bank Height Ratio	2.03	0.00	0.00	0.00	Not Functioning	
		Entrenchment Ratio	1.36	0.00				
Geomorphology	Large Woody Debris	LWD Index	1259	0.65	0.65	0.68	Functioning At Risk	
	Lateral Migration	Dominant BEHI/NBS	M/H	0.30	0.59			
		Percent Streambank Erosion (%)	32	0.46				
		Percent Streambank Armoring (%)	0	1.00				
	Riparian Vegetation	Buffer Width (ft)	180	1.00	0.88			
		Average DBH (Inches)	9.4	0.78				
		Tree Density (#/Ac)	69.3	0.73				
		Native Shrub/Sapling Density (#/Ac)	3143.3	1.00				
		Native Herbaceous Cover (%)	27.5	FALSE				
	Bed Form Diversity	Pool Spacing Ratio	1.6	0.24	0.59			
		Pool Depth Ratio	1.61	0.39				
		Percent Riffle (%)	51.71	1.00				
		Aggradation Ratio	1.18	0.73				
Physicochemical	Temperature	July Mean Temperature (°F)	67.1	1.00	1.00	0.61	Functioning At Risk	
	Bacteria	E. Coli (cfu/100 ml)	220.44	0.77	0.77			
	Nutrients	Total Phosphorus (mcg/L)	20	0.62	0.62			
	Dissolved Oxygen	DO Concentration (mg/L)	3.4	0.06	0.06			
Biology	Macroinvertebrates	Macroinvertebrate P51 Index Score	-1	0.44	0.44	0.45	Functioning At Risk	
		Macroinvertebrate P22 Index Score						
	Fish	Fish P51 Index Score	-1	0.45	0.45			

Site Information and Reference Standard Stratification	
Project Name:	White Pine
Reach ID:	25z
Restoration Potential:	NA
Existing Stream Length (ft):	348
Proposed Stream Length (ft):	
Existing Stream Type:	C
Proposed/ Reference Stream Type:	C
Valley Type:	Unconfined Alluvial
Drainage Area (sq. mi.):	
Strahler Stream Order:	Second
Flow Type:	Perennial
Ecoregion:	Northern Lakes and Forests
Bed Material:	Sand
Stream Slope (%):	0.6
Stream Temperature:	Warm
Wadeable/Non-wadeable:	Wadeable
Reference Vegetation Community:	Forested

Notes
1. Users input values that are highlighted based on restoration potential
2. Users select values from a pull-down menu
3. Leave values blank for field values that were not measured and/or autopopulate

FUNCTIONAL CHANGE SUMMARY	
Existing Condition Score (ECS)	0.53
Proposed Condition Score (PCS)	
Change in Functional Condition (PCS - ECS)	
Percent Condition Change	
Existing Stream Length (ft)	348
Proposed Stream Length (ft)	
Additional Stream Length (ft)	
Existing Functional Foot Score (FFS)	184
Proposed Functional Foot Score (FFS)	
Proposed FFS - Existing FFS (ΔFF)	
Yield (ΔFF/Proposed LF)	

BMP FUNCTIONAL CHANGE SUMMARY	
Existing BMP Functional Feet Score (FFS)	0
Proposed BMP Functional Feet Score (FFS)	0
Proposed BMP FFS - Existing BMP FFS	0

FUNCTIONAL FEET (FF) SUMMARY	
Existing Stream FFS + Existing BMP FFS	184
Proposed Stream FFS + Proposed BMP FFS	
Total Proposed FFS - Total Existing FFS	
Yield (ΔFF/Proposed LF)	

FUNCTION-BASED PARAMETER SUMMARY			
Functional Category	**Function-Based Parameters**	**Existing Parameter**	**Proposed Parameter**
Hydrology	Reach Runoff	1.00	
Hydraulics	Floodplain Connectivity	0.00	
Geomorphology	Large Woody Debris	0.14	
	Lateral Migration	0.57	
	Riparian Vegetation	0.94	
	Bed Form Diversity	0.69	
Physicochemical	Temperature	1.00	
	Bacteria	0.77	
	Nutrients	0.62	
	Dissolved Oxygen	0.06	
Biology	Macroinvertebrates	0.44	
	Fish	0.45	

FUNCTIONAL CATEGORY REPORT CARD			
Functional Category	**ECS**	**PCS**	**Functional Change**
Hydrology	1.00		
Hydraulics	0.00		
Geomorphology	0.59		
Physicochemical	0.61		
Biology	0.45		

Reach ID: 25z

EXISTING CONDITION ASSESSMENT					Roll Up Scoring			
Functional Category	**Function-Based Parameters**	**Metric**	**Field Value**	**Index Value**	**Parameter**	**Category**	**Category**	**Overall**
Hydrology	Reach Runoff	Land Use Change Coefficient	30	1.00	1.00	1.00	Functioning	0.53
		Concentrated Flow Points (#/1000 LF)	0	1.00				
Hydraulics	Floodplain Connectivity	Bank Height Ratio	3.05	0.00	0.00	0.00	Not Functioning	
		Entrenchment Ratio	1.17	0.00				
Geomorphology	Large Woody Debris	LWD Index	266	0.14	0.14	0.59	Functioning At Risk	
	Lateral Migration	Dominant BEHI/NBS	H/H	0.20	0.57			
		Percent Streambank Erosion (%)	27	0.52				
		Percent Streambank Armoring (%)	0	1.00				
	Riparian Vegetation	Buffer Width (ft)	180	1.00	0.94			
		Average DBH (Inches)	9.3	0.77				
		Tree Density (#/Ac)	131	1.00				
		Native Shrub/Sapling Density (#/Ac)	808.9	1.00				
		Native Herbaceous Cover (%)	62.5	FALSE				
	Bed Form Diversity	Pool Spacing Ratio	3.58	1.00	0.69			
		Pool Depth Ratio	3.4	1.00				
		Percent Riffle (%)	39.06	0.76				
		Aggradation Ratio	2.06	0.00				
Physicochemical	Temperature	July Mean Temperature (°F)	67.1	1.00	1.00	0.61	Functioning At Risk	
	Bacteria	E. Coli (cfu/100 ml)	220.44	0.77	0.77			
	Nutrients	Total Phosphorus (mcg/L)	20	0.62	0.62			
	Dissolved Oxygen	DO Concentration (mg/L)	3.4	0.06	0.06			
Biology	Macroinvertebrates	Macroinvertebrate P51 Index Score	-1	0.44	0.44	0.45	Functioning At Risk	
		Macroinvertebrate P22 Index Score						
	Fish	Fish P51 Index Score	-1	0.45	0.45			

Site Information and Reference Standard Stratification	
Project Name:	White Pine
Reach ID:	26
Restoration Potential:	NA
Existing Stream Length (ft):	158
Proposed Stream Length (ft):	
Existing Stream Type:	E
Proposed/ Reference Stream Type:	E
Valley Type:	Unconfined Alluvial
Drainage Area (sq. mi.):	
Strahler Stream Order:	First
Flow Type:	Perennial
Ecoregion:	Northern Lakes and Forests
Bed Material:	Silt/Clay
Stream Slope (%):	0.9
Stream Temperature:	Warm
Wadeable/Non-wadeable:	Wadeable
Reference Vegetation Community:	Forested

Notes
1. Users input values that are highlighted based on restoration potential
2. Users select values from a pull-down menu
3. Leave values blank for field values that were not measured and/or autopopulate

FUNCTIONAL CHANGE SUMMARY	
Existing Condition Score (ECS)	0.70
Proposed Condition Score (PCS)	
Change in Functional Condition (PCS - ECS)	
Percent Condition Change	
Existing Stream Length (ft)	158
Proposed Stream Length (ft)	
Additional Stream Length (ft)	
Existing Functional Foot Score (FFS)	111
Proposed Functional Foot Score (FFS)	
Proposed FFS - Existing FFS (ΔFF)	
Yield (ΔFF/Proposed LF)	

BMP FUNCTIONAL CHANGE SUMMARY	
Existing BMP Functional Feet Score (FFS)	0
Proposed BMP Functional Feet Score (FFS)	0
Proposed BMP FFS - Existing BMP FFS	0

FUNCTIONAL FEET (FF) SUMMARY	
Existing Stream FFS + Existing BMP FFS	111
Proposed Stream FFS + Proposed BMP FFS	
Total Proposed FFS - Total Existing FFS	
Yield (ΔFF/Proposed LF)	

FUNCTION-BASED PARAMETER SUMMARY			
Functional Category	**Function-Based Parameters**	**Existing Parameter**	**Proposed Parameter**
Hydrology	Reach Runoff	1.00	
Hydraulics	Floodplain Connectivity	1.00	
Geomorphology	Large Woody Debris	0.04	
	Lateral Migration	1.00	
	Riparian Vegetation	0.83	
	Bed Form Diversity	0.49	
Physicochemical	Temperature	1.00	
	Bacteria	0.90	
	Nutrients	0.46	
	Dissolved Oxygen	0.00	
Biology	Macroinvertebrates	0.28	
	Fish	0.35	

FUNCTIONAL CATEGORY REPORT CARD			
Functional Category	**ECS**	**PCS**	**Functional Change**
Hydrology	1.00		
Hydraulics	1.00		
Geomorphology	0.59		
Physicochemical	0.59		
Biology	0.32		

Reach ID: 26

EXISTING CONDITION ASSESSMENT					Roll Up Scoring			
Functional Category	**Function-Based Parameters**	**Metric**	**Field Value**	**Index Value**	**Parameter**	**Category**	**Category**	**Overall**
Hydrology	Reach Runoff	Land Use Change Coefficient	30	1.00	1.00	1.00	Functioning	0.70
		Concentrated Flow Points (#/1000 LF)	0	1.00				
Hydraulics	Floodplain Connectivity	Bank Height Ratio	0.62	1.00	1.00	1.00	Functioning	
		Entrenchment Ratio	6.25	1.00				
Geomorphology	Large Woody Debris	LWD Index	79	0.04	0.04	0.59	Functioning At Risk	
	Lateral Migration	Dominant BEHI/NBS	L/L	1.00	1.00			
		Percent Streambank Erosion (%)	0	1.00				
		Percent Streambank Armoring (%)	0	1.00				
	Riparian Vegetation	Buffer Width (ft)	180	1.00	0.83			
		Average DBH (Inches)	11.75	0.98				
		Tree Density (#/Ac)	30.8	0.32				
		Native Shrub/Sapling Density (#/Ac)	2742.7	1.00				
		Native Herbaceous Cover (%)	94	FALSE				
	Bed Form Diversity	Pool Spacing Ratio	12.65	0.00	0.49			
		Pool Depth Ratio	1.49	0.29				
		Percent Riffle (%)	36.31	0.65				
		Aggradation Ratio	0.96	1.00				
Physicochemical	Temperature	July Mean Temperature (°F)	64.2	1.00	1.00	0.59	Functioning At Risk	
	Bacteria	E. Coli (cfu/100 ml)	95.53	0.90	0.90			
	Nutrients	Total Phosphorus (mcg/L)	35	0.46	0.46			
	Dissolved Oxygen	DO Concentration (mg/L)	-0.01	0.00	0.00			
Biology	Macroinvertebrates	Macroinvertebrate P51 Index Score	-4	0.28	0.28	0.32	Functioning At Risk	
		Macroinvertebrate P22 Index Score						
	Fish	Fish P51 Index Score	-3	0.35	0.35			

E-4

Stream Channel Mapping Technical Memorandum

Technical Memorandum

To: Amanda Zeidler, White Pine Copper
From: Matt Stone-Palmquist, Jill Geyer, Leah Anderson - Barr
Subject: Stream Channel Mapping
Date: March 20, 2026
Project: 22661013.01

1 Background

White Pine Copper (WPC) contracted Barr Engineering Co. (Barr) in 2024 to conduct baseline studies on all streams[1] within a defined Area of Investigation (AOI) generally located to the west, north, and east of the existing North Dam 2 at White Pine North (WPN). The purpose of that study was rooted in the requirements for an Environmental Impact Assessment under the Michigan Natural Resources and Environmental Protection Act (NREPA) of 1994 Part 632 (Nonferrous Metallic Mining) (ref. (1)) and NREPA Part 301 (Inland Lakes and Streams Protection) (ref. (2)). Permits under both parts may be needed if any construction or mining activities have the potential to result in direct and/or indirect impacts to streams. Direct impacts include excavation and filling of streams while indirect impacts result in changes to the drainage or flow of the stream.

As part of that work, Barr determined that several mapped drainage ways on the National Hydrography Dataset (NHD) did not exhibit the defining characteristics needed to be regulated as a "stream" under Michigan law in that they lacked one or more of the following: definite banks, a bed, and visible evidence of continued flow (ref. (3)). During the 2024 efforts, Barr's in-field investigation identified evidence that the historic mining activities on the site, and in particular the construction of North Dam 2, altered the local hydrology and cut off headwaters of streams, such that mapped NHD flowlines did not presently meet the statutory definition of a "stream." However, given that the 2024 AOI did not extend northerly to the full property ownership boundary of WPC, an unresolved question was whether any of these mapped NHD flow lines would meet the statutory definition of a stream on the WPN site, and if so, would potential future mining activities involve a direct or indirect impact to a regulated stream. To this end, Barr's operational subsidiary, Barr Engineering Michigan, LLC, performed additional field investigation in 2025 to extend the northerly (downslope) limit of the 2024 AOI to the northern WPN property boundary. This additional study area included the following drainage features listed from west to east (Figure 1):

- Unnamed 5,
- Native Creek,
- Unnamed 6,

[1] NATURAL RESOURCES AND ENVIRONMENTAL PROTECTION ACT, Act 451 of 1994
324.30101 Definitions.
Sec. 30101.
(i) "Inland lake or stream" means…:
(ii) A natural or artificial lake, pond, or impoundment; a river, stream, or creek which may or may not be serving as a drain as defined by the drain code…or any other body of water that has definite banks, a bed, and visible evidence of a continued flow or continued occurrence of water, including the St. Mary's, St. Clair, and Detroit Rivers.

- Unnamed 7,
- Patent Creek,
- Unnamed 8,
- Miles Creek, and
- Stoney Creek.

2 Observations and Findings

No additional streams were identified within the expanded AOI.

Field investigations were conducted October 8 – 9, 2025 by walking the length of the mapped NHD drainage features and taking photos at several locations, beginning at the northern limit of the 2024 AOI and ending at the northern property boundary of WPN. During the site investigation, several apparent fluvial valleys were observed, but the valleys did not contain channels with definite banks, a bed, and visible evidence of continued flow. Therefore, Barr's opinion is that the valleys do not meet MCL – Section 324.30101.i.ii definition of a stream, and would not be regulated as a stream. Rather, features within these valleys appeared to be remnant channels of two general types:

1. Brush covered and filled with both herbaceous and woody vegetation (thereby lacking a stream "bed") and dry (thereby lacking evidence of continued flow); and

2. Intermittent segments of dry valley and ponded water behind beaver dams and lacking evidence of continued flow[2].

Please be aware that, although these features do not meet the definition of a stream, several features encountered would likely be considered wetlands under Michigan regulations, particularly those noted as having ponding. Barr recommends review of those features based on wetland delineation and jurisdictional consideration if potential impacts to those features are proposed.

The investigation findings are summarized in Table 1 with a listing of the NHD flowlines investigated, downslope of existing North Dam No. 2, with a photolog in Appendix A.

[2] Observed features with banks, bed and visible evidence of continued occurrence of water, but not flowing water, would likely meet the NREPA statutory definition of an inland lake (if 5 surface acres of open water or larger), a pond (if less than 5 surface acres of open water but at least 1 surface acre of open water); or a wetland (if less than 1 surface acre of open water).

Table 1 Stream Reconnaissance Findings

Stream	Findings
Unnamed 5	dry upstream, ponded downstream
Native Creek	dry upstream, ponded downstream
Unnamed 6	dry, no river valley observed downstream
Unnamed 7	dry
Patent Creek	dry upstream, ponded downstream
Unnamed 8	dry
Miles Creek	dry upstream, ponded downstream
Stony Creek	dry upstream, ponded downstream

3 References

1. **Michigan Legislature, Michigan Compiled Laws Complete Through PA 38 of 2025.** *MCL - 451-1994-III-3-4-632.* 2026.

2. —. *MCL - 451-1994-III-1-INLAND-WATERS-301.* 2026.

3. **Barr Engineering Co.** Memorandum to A. Zeidler from M. Stone-Palmquist. *, Recommendations from 2024 Stream Characterization Work Scope.* 2025, January 9.

Attachments

Figure 1 Proposed Facilities and Identified Stream Locations
Appendix A Photolog

Figure 1

Proposed Facilities and Identified Stream Locations



Survey Area
2024 Survey Area
Surface Rights Extent

Survey Stream Locations
Stream observed during reconnaissance
No stream observed during reconnaissance

N

0 1,800 3,600
Feet

Imagery: USDA NAIP 2024

Identified Stream Locations
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

FIGURE 1

BARR

Barr Footer: ArcGISPro 3.6.1 , 2026-03-04 10:13 File: I:\Projects\22\66\1013\Maps\Reports\Streams_Report\Streams_Report.aprx Layout: Fig01 Identified Stream Locations User: ERM3

Appendix A

Photolog

Creek Name: Unnamed 5 Reach: NA

Photo 1-1



Photo caption: Dry Valley

Photo Locations Overview

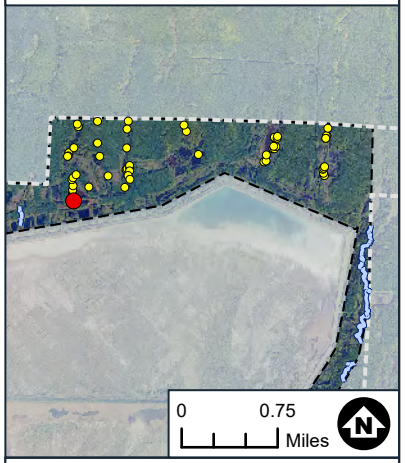


Photo 1 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Unnamed 5 Reach: NA

Photo 2-1



Photo caption: Dry Valley

Photo Locations Overview

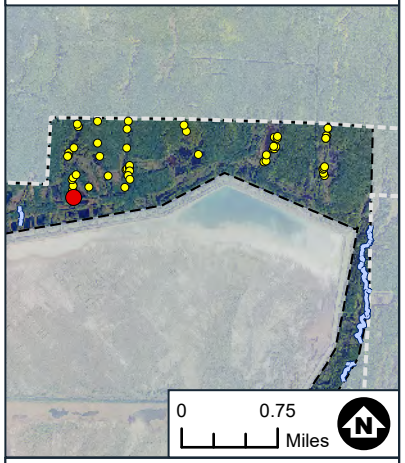


Photo 2 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Unnamed 5 Reach: NA

Photo 3-1



Photo caption: Dry Valley

Photo Locations Overview

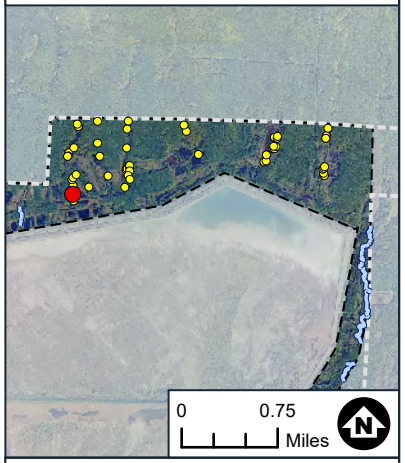
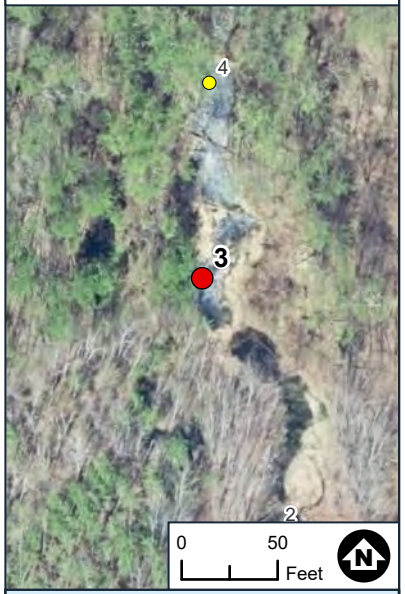


Photo 3 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Unnamed 5 Reach: NA

Photo 4-1



Photo caption: Dry Valley

Photo Locations Overview

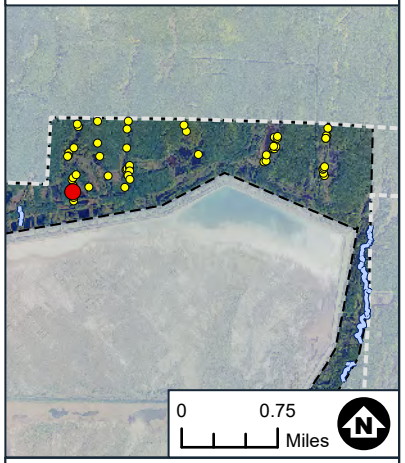
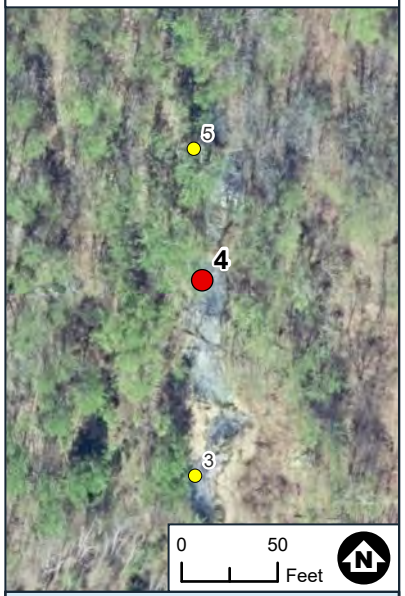


Photo 4 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Unnamed 5 Reach: NA

Photo 5-1



Photo caption: Dry Valley

Photo Locations Overview

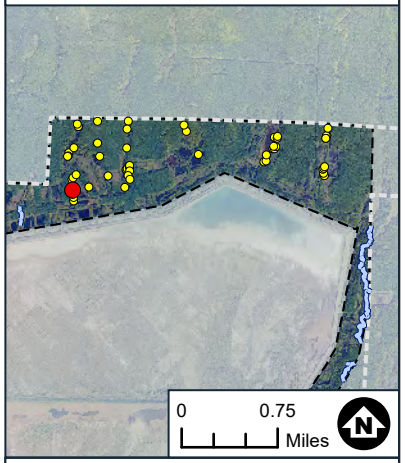
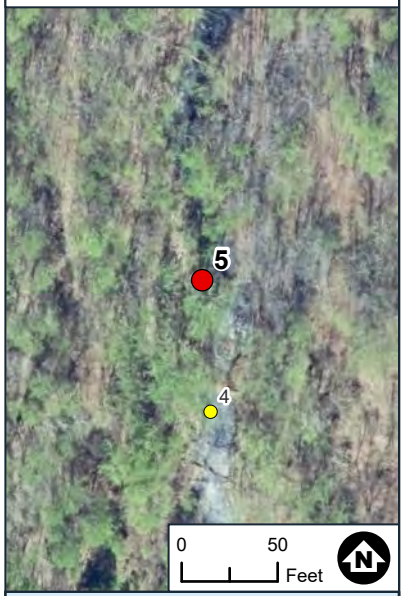


Photo 5 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Unnamed 5 Reach: NA

Photo 6-1



Photo caption: Dry Valley

Photo Locations Overview

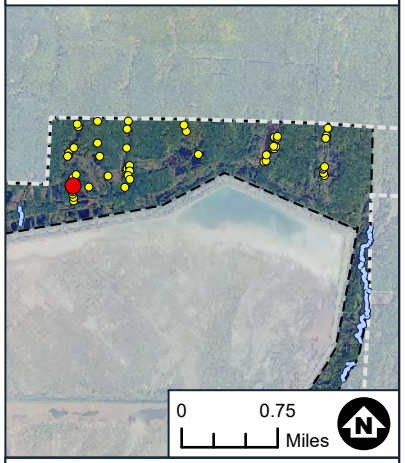


Photo 6 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Unnamed 5 Reach: NA

Photo 7-1



Photo caption: Dry Valley

Photo Locations Overview

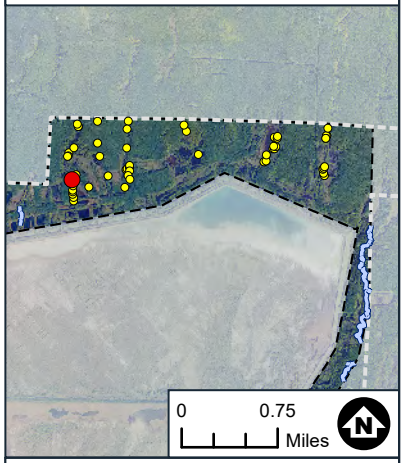
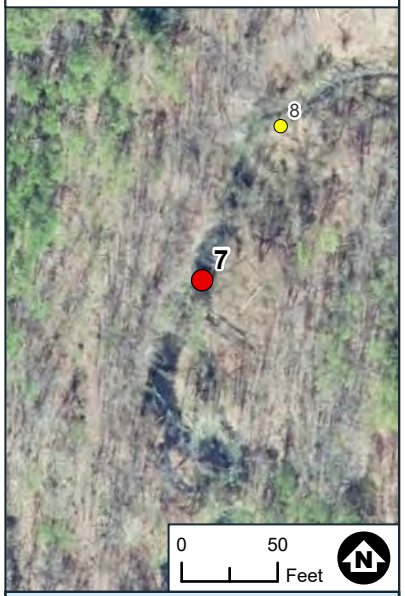


Photo 7 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Unnamed 5 Reach: NA

Photo 8-1



Photo caption: Dry Valley

Photo Locations Overview

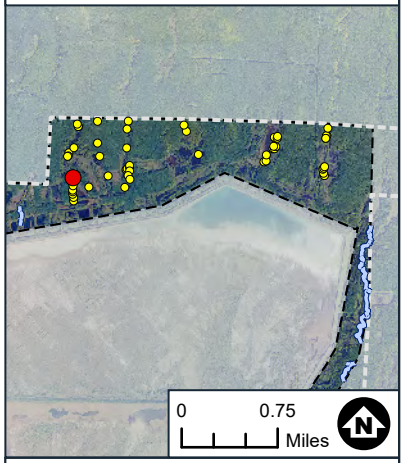
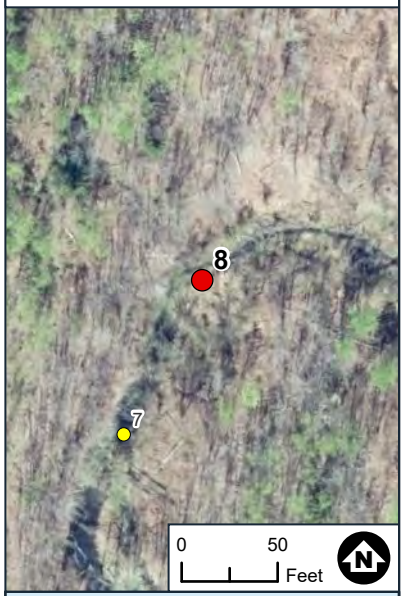


Photo 8 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Unnamed 5 Reach: NA

Photo 9-1



Photo caption: Soft Ground from Impoundment Backwater

Photo Locations Overview

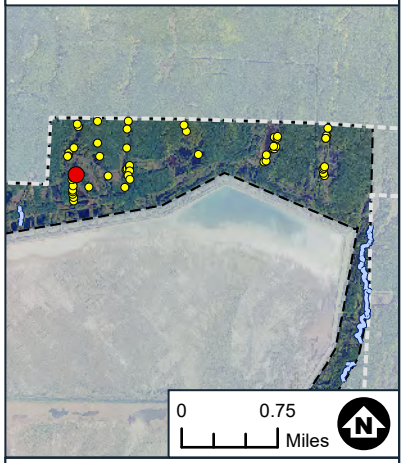


Photo 9 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Native Creek Reach: NA

Photo 10-1



Photo caption: Valley, No Stream

Photo Locations Overview

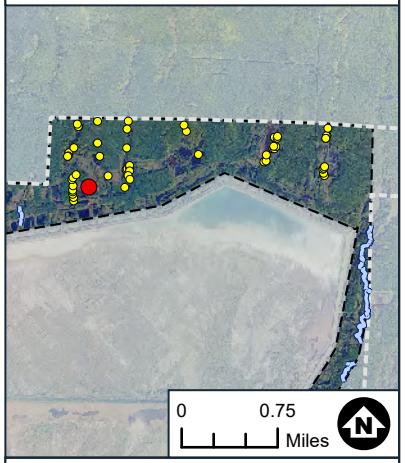
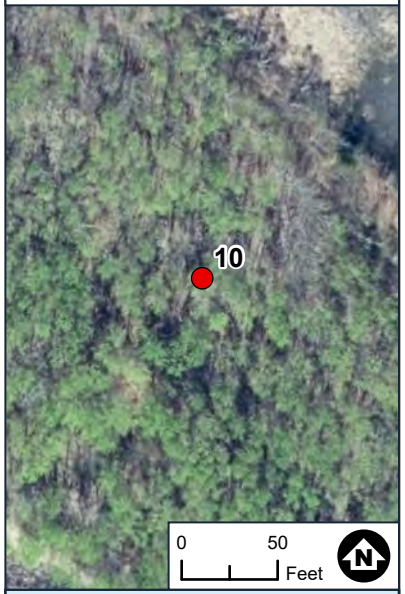


Photo 10 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Native Creek Reach: NA

Photo 11-1



Photo caption: Looking Downstream at Dam

Photo Locations Overview

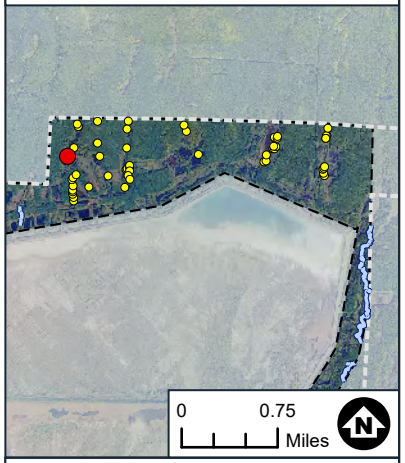


Photo 11 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Native Creek Reach: NA

Photo 12-1



Photo caption: Looking Upstream at Impoundment

Photo 12-2



Photo caption:

Photo Locations Overview

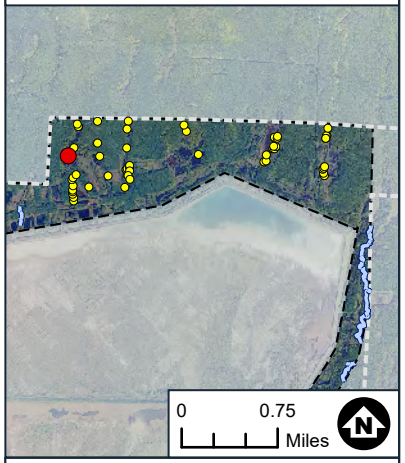


Photo 12 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Native Creek Reach: NA

Photo 13-1



Photo caption: Looking Across Impoundment Downstream of Dam

Photo Locations Overview

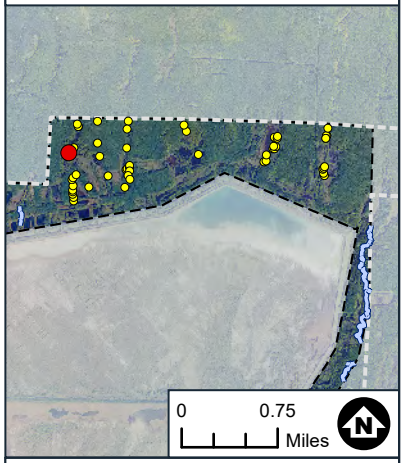
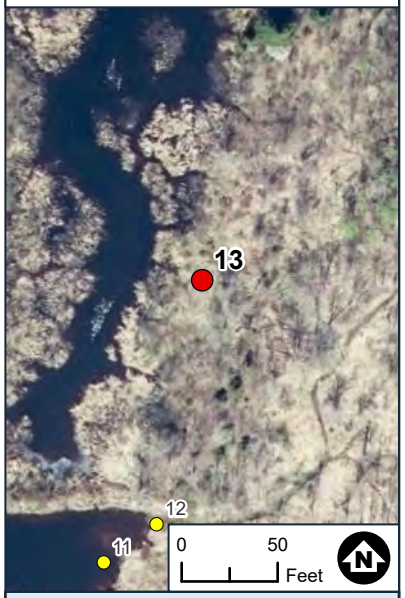


Photo 13 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Native Creek Reach: NA

Photo 14-1



Photo caption: Beaver Habitat

Photo 14-2



Photo caption:

Photo Locations Overview

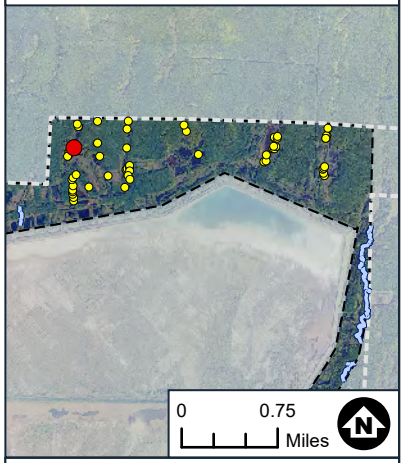


Photo 14 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Native Creek Reach: NA

Photo 15-1



Photo caption: Looking Upstream at Dam

Photo Locations Overview

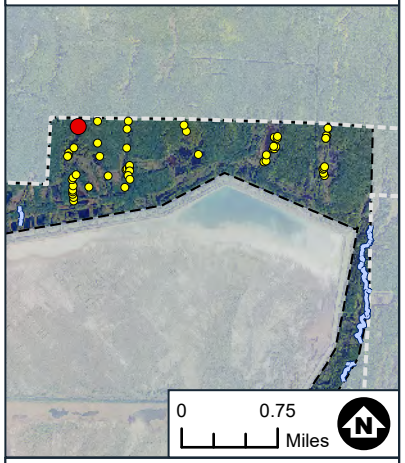
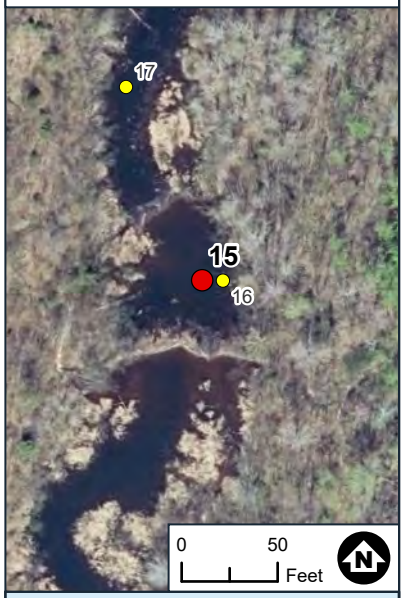


Photo 15 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Native Creek Reach: NA

Photo 16-1



Photo caption: Looking Downstream at Impoundment

Photo Locations Overview

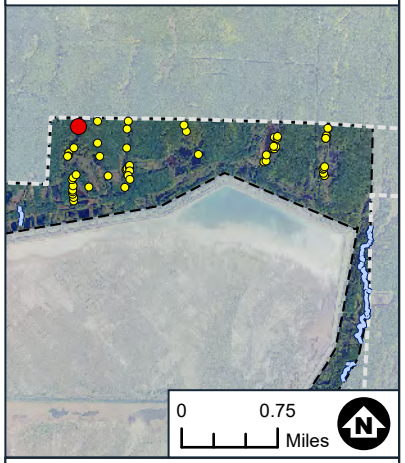


Photo 16 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Native Creek Reach: NA

Photo 17-1



Photo caption: Looking Downstream at Impoundment

Photo Locations Overview

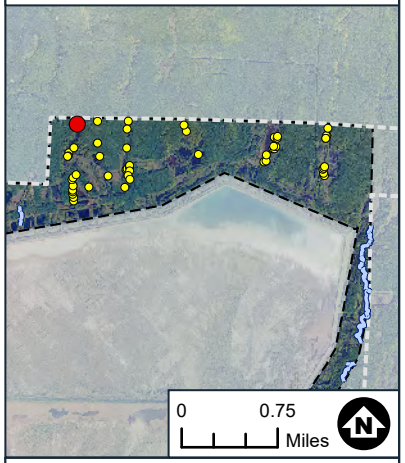
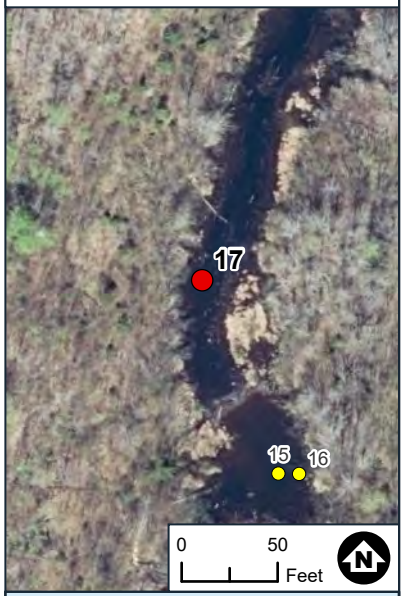


Photo 17 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Unnamed 6 Reach: NA

Photo 18-1



Photo caption: Dry Valley

Photo Locations Overview

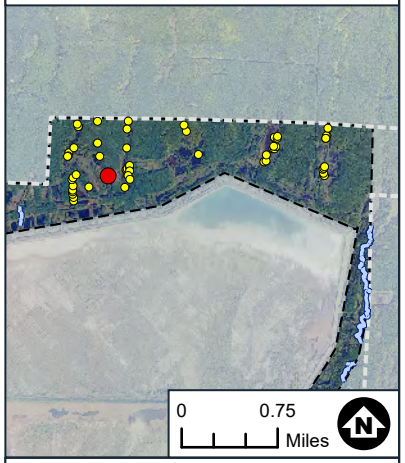
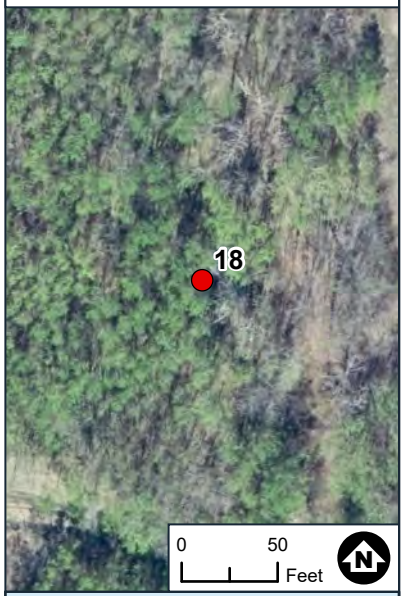


Photo 18 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Unnamed 6 Reach: NA

Photo 19-1



Photo caption: Forested, No Valley

Photo Locations Overview

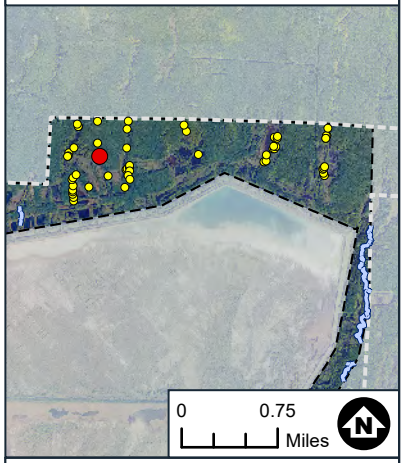
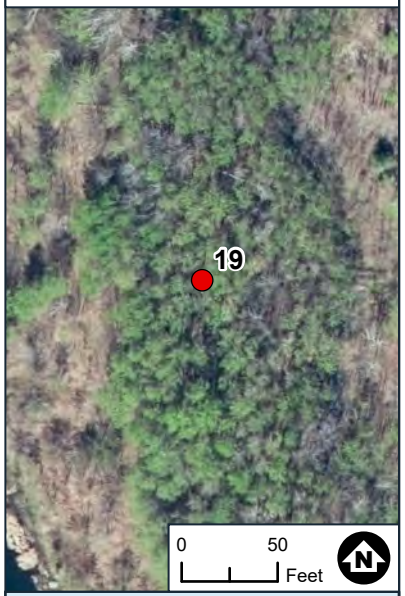


Photo 19 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Unnamed 6 Reach: NA

Photo 20-1



Photo caption: Dry Valley

Photo Locations Overview

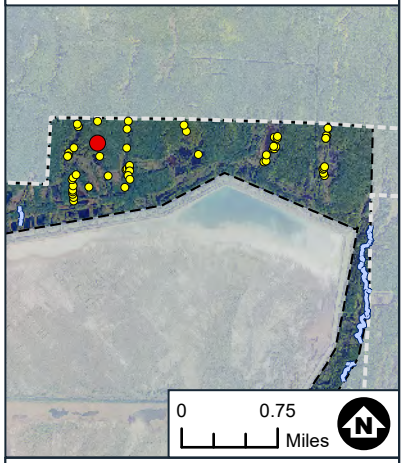


Photo 20 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Unnamed 6 Reach: NA

Photo 21-1



Photo caption: Forested, No Valley

Photo Locations Overview

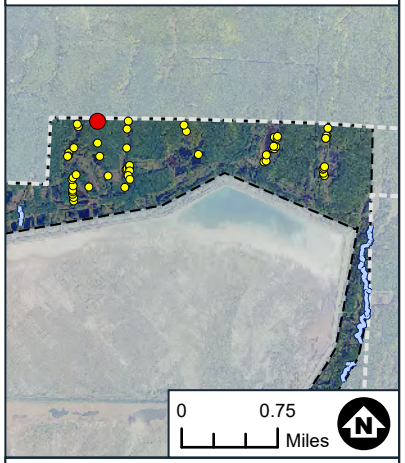
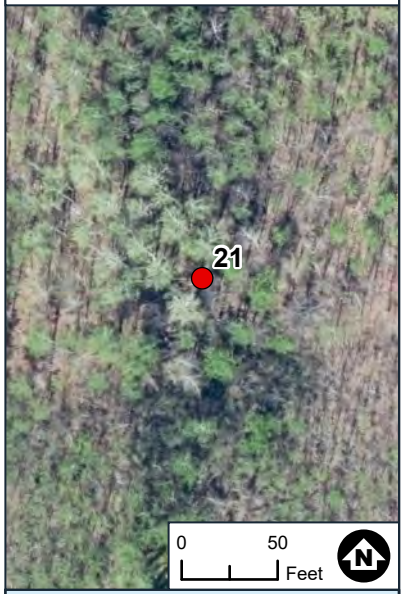


Photo 21 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Unnamed 7 Reach: NA

Photo 22-1



Photo caption: Forested, No Valley

Photo Locations Overview

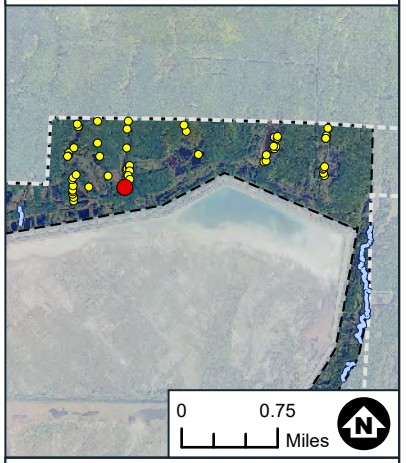


Photo 22 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Patent Creek Reach: NA

Photo 23-1



Photo caption: Dry Valley, Possibly Cutoff by Logging Road

Photo Locations Overview

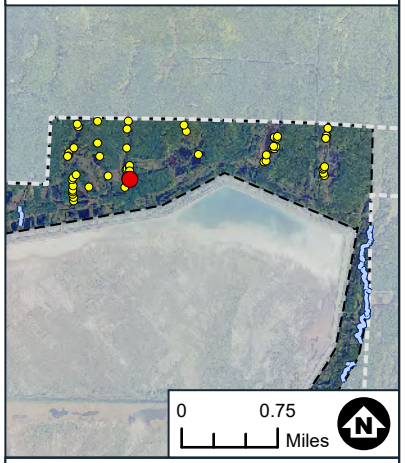


Photo 23 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Patent Creek Reach: NA

Photo 24-1



Photo caption: Dry Valley

Photo Locations Overview

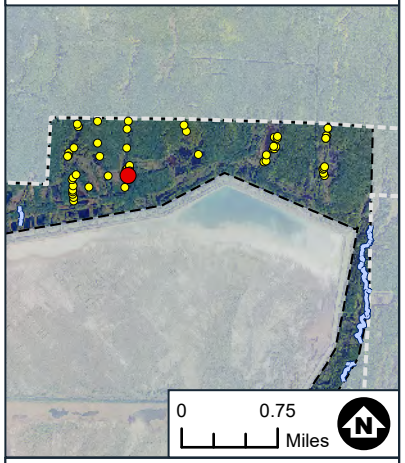
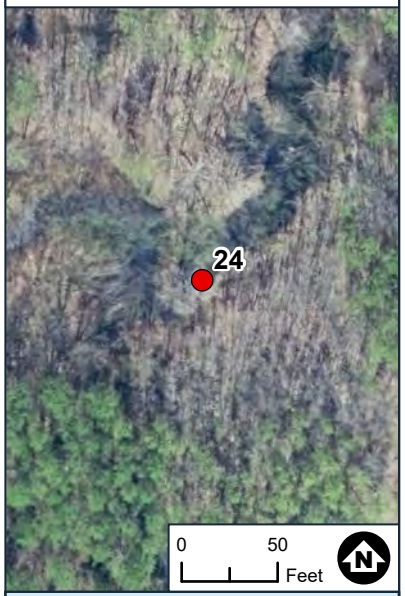


Photo 24 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Patent Creek Reach: NA

Photo 25-1



Photo caption: Soft Ground from Impoundment Backwater

Photo Locations Overview

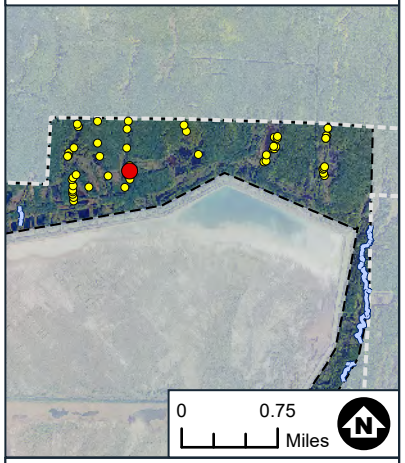
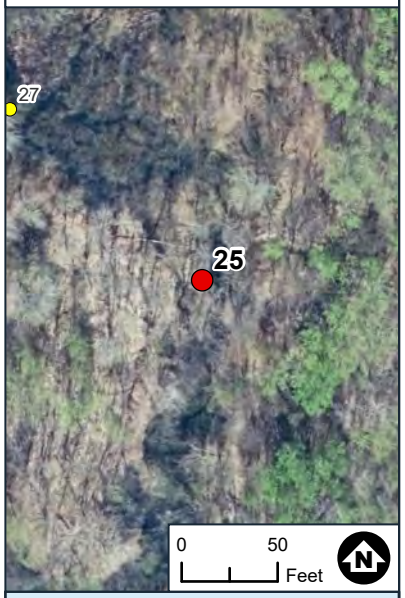


Photo 25 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Patent Creek Reach: NA

Photo 26-1



Photo caption: Dry Valley

Photo Locations Overview

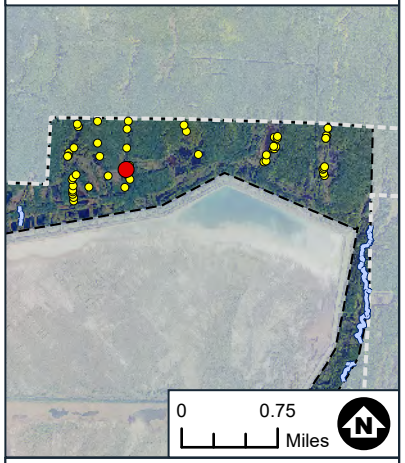


Photo 26 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Patent Creek Reach: NA

Photo 27-1



Photo caption: Soft Ground from Impoundment Backwater

Photo Locations Overview

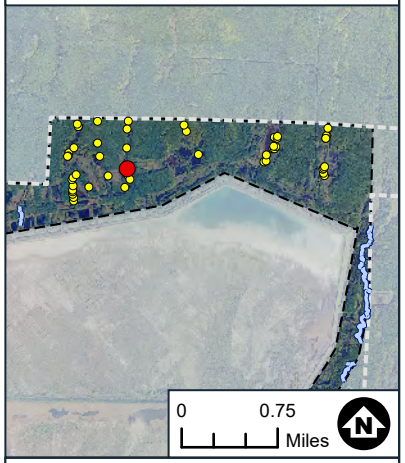
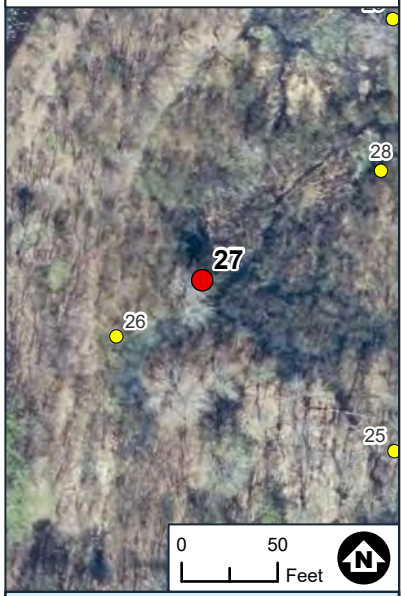


Photo 27 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Patent Creek Reach: NA

Photo 28-1



Photo caption: Soft Ground from Impoundment Backwater

Photo Locations Overview

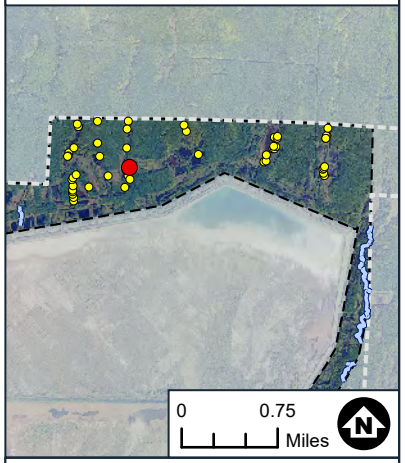
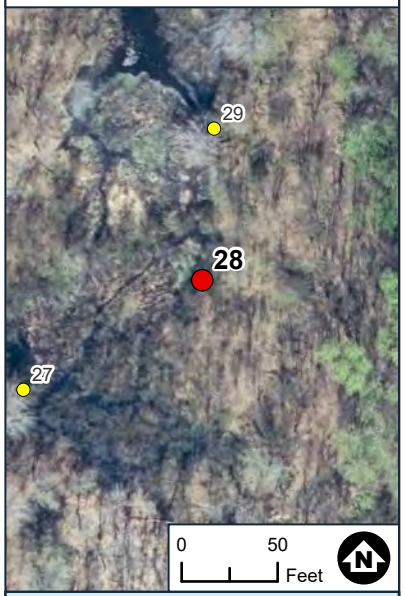


Photo 28 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Patent Creek Reach: NA

Photo 29-1



Photo caption: Dry Valley

Photo Locations Overview

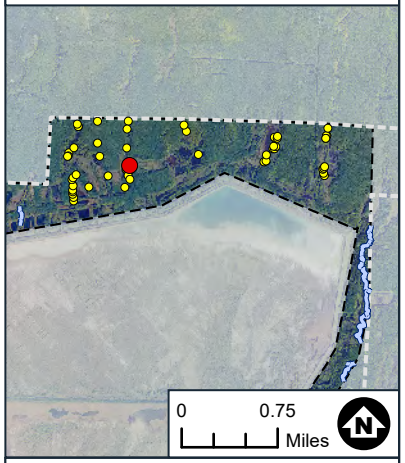
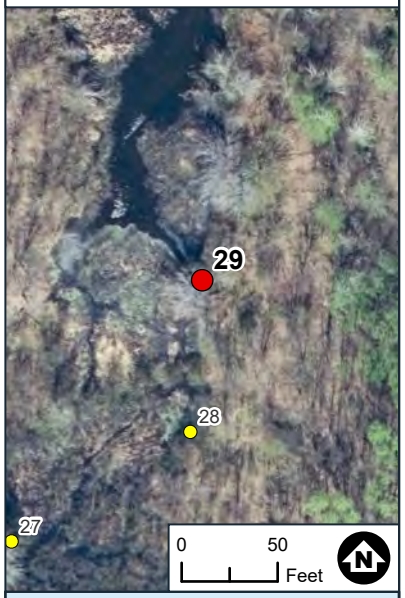


Photo 29 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Patent Creek Reach: NA

Photo 30-1



Photo caption: Looking Across Impoundment

Photo 30-2



Photo caption: Looking Across Impoundment

Photo Locations Overview

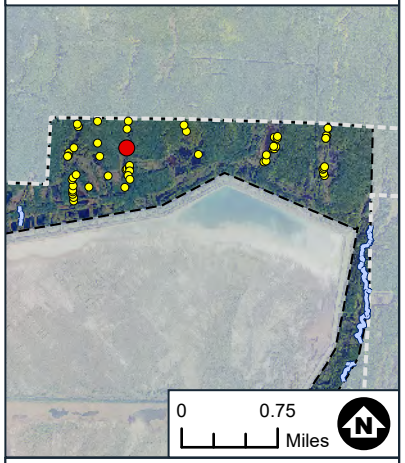


Photo 30 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Patent Creek Reach: NA

Photo 31-1



Photo caption: Looking Upstream at Impoundment

Photo Locations Overview

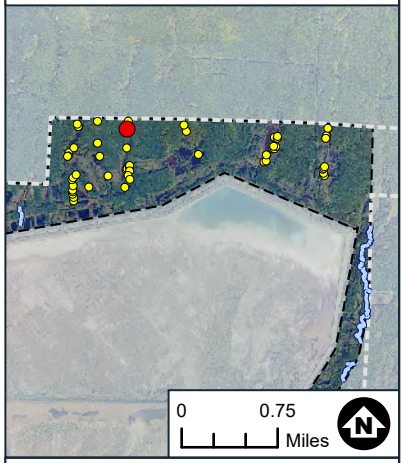


Photo 31 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Patent Creek Reach: NA

Photo 32-1



Photo caption: Looking Downstream at Impoundment

Photo Locations Overview

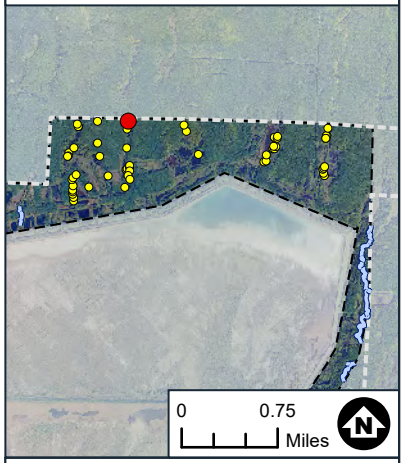


Photo 32 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Unnamed 8 Reach: NA

Photo 33-1



Photo caption: Probable Beaver Slide Connecting Impoundments

Photo Locations Overview

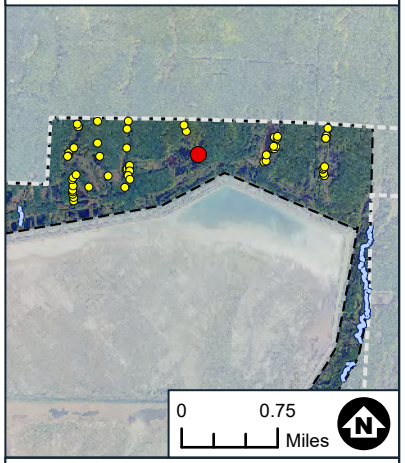


Photo 33 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Unnamed 8 Reach: NA

Photo 34-1



Photo caption: Looking Across Impoundment

Photo Locations Overview

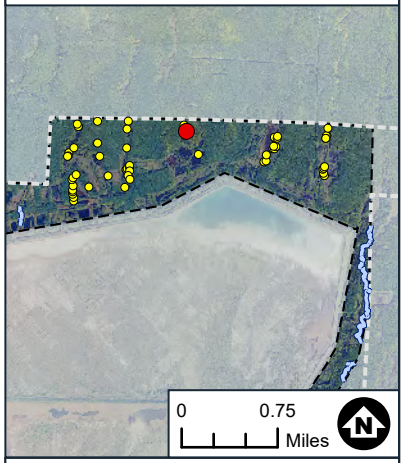
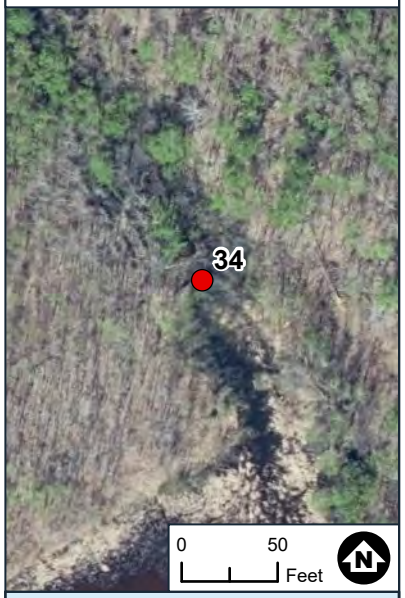


Photo 34 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Unnamed 8 Reach: NA

Photo 35-1



Photo caption: Forested, No Valley

Photo Locations Overview

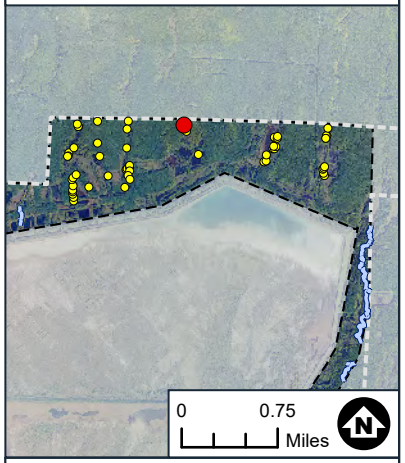
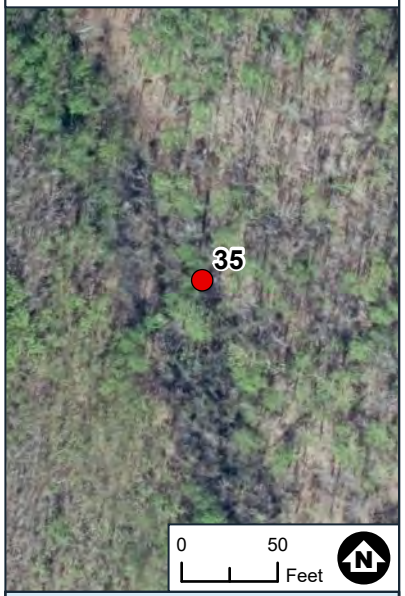


Photo 35 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Miles Creek Reach: NA

Photo 36-1



Photo caption: Disconnected Pond, No Visible Outlet

Photo Locations Overview

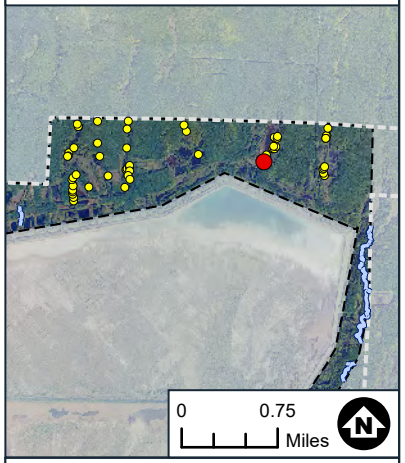


Photo 36 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Miles Creek Reach: NA

Photo 37-1



Photo caption: Looking Across Impoundment

Photo Locations Overview

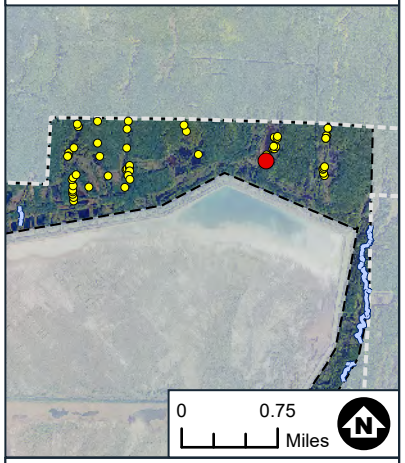


Photo 37 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Miles Creek Reach: NA

Photo 38-1



Photo caption: No Stream, Old Clear Cut

Photo Locations Overview

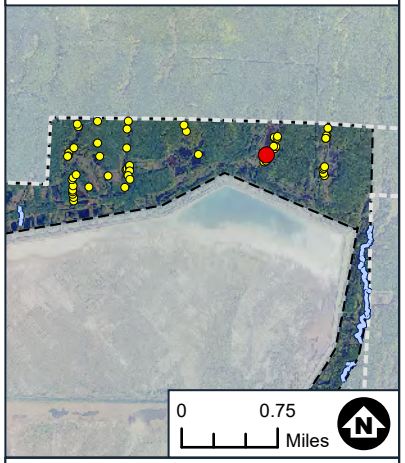


Photo 38 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Miles Creek Reach: NA

Photo 39-1



Photo caption: Dry Valley

Photo Locations Overview

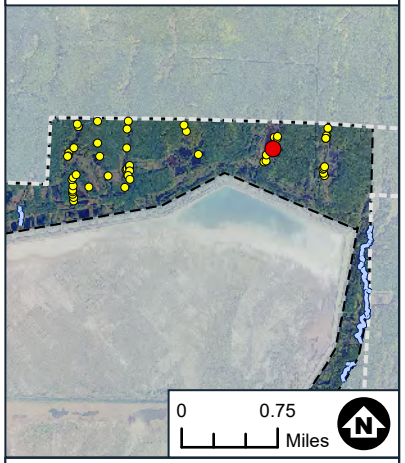
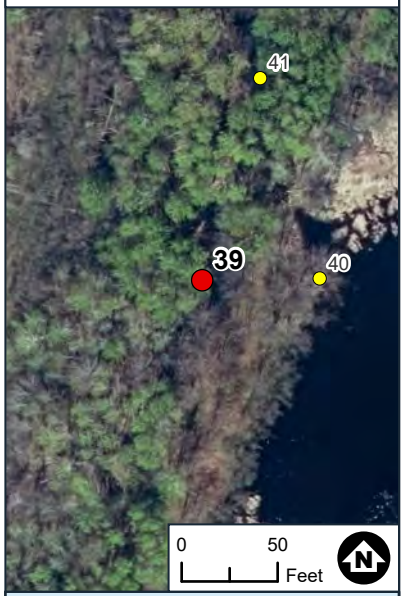


Photo 39 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Miles Creek Reach: NA

Photo 40-1



Photo caption: Looking Across Impoundment

Photo Locations Overview

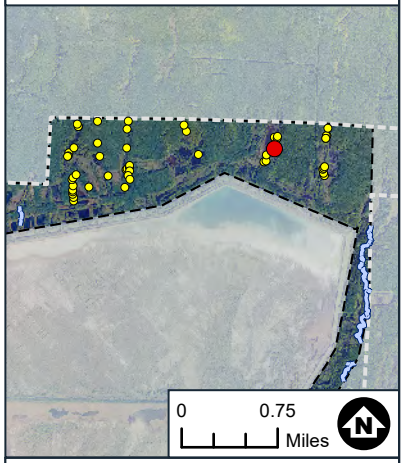
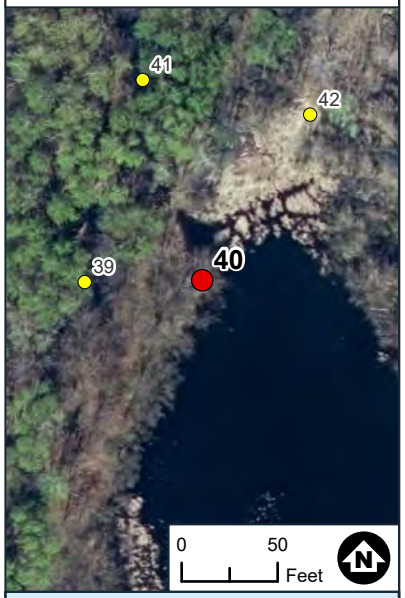


Photo 40 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Miles Creek Reach: NA

Photo 41-1



Photo caption: Dry Valley

Photo Locations Overview

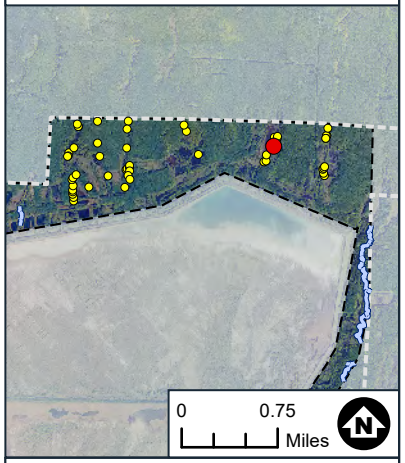
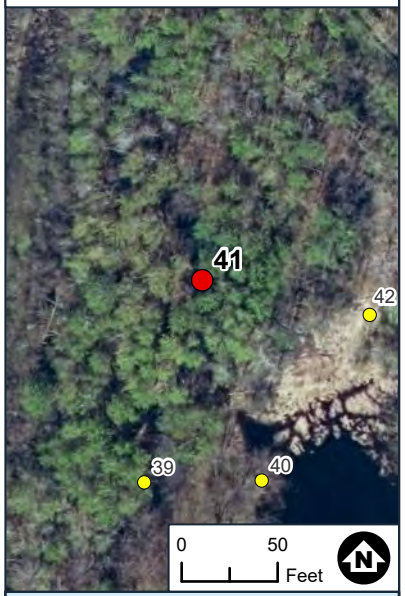


Photo 41 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Miles Creek Reach: NA

Photo 42-1



Photo caption: Disconnected Pond, No Visible Inlet or Outlet

Photo Locations Overview

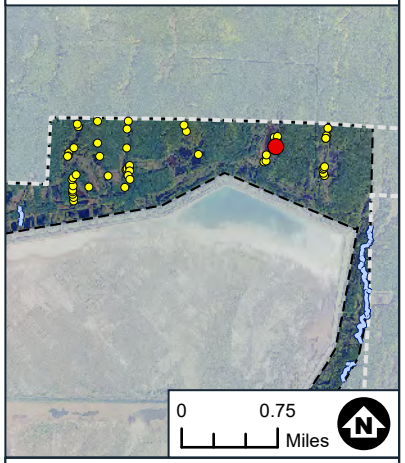
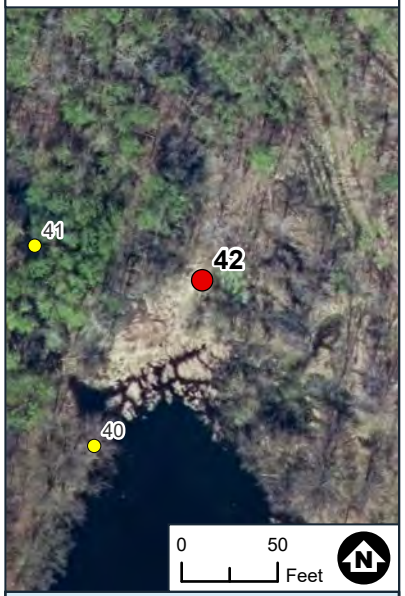


Photo 42 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Miles Creek Reach: NA

Photo 43-1



Photo caption: Probable Beaver Slide

Photo Locations Overview

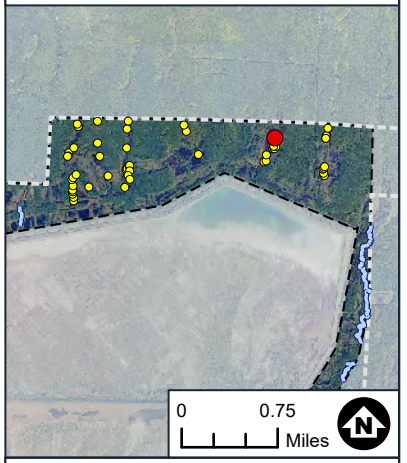
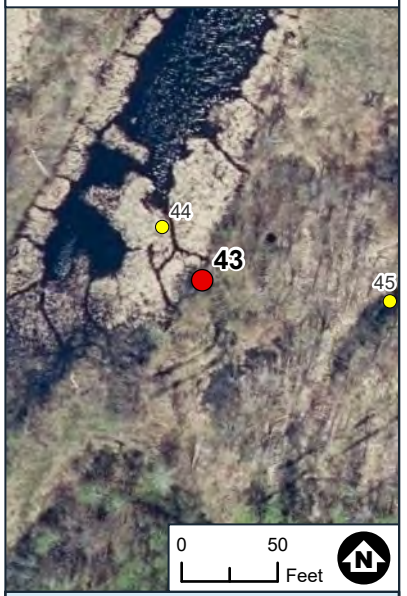


Photo 43 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Miles Creek Reach: NA

Photo 44-1



Photo caption: Edge of Impoundment

Photo 44-2

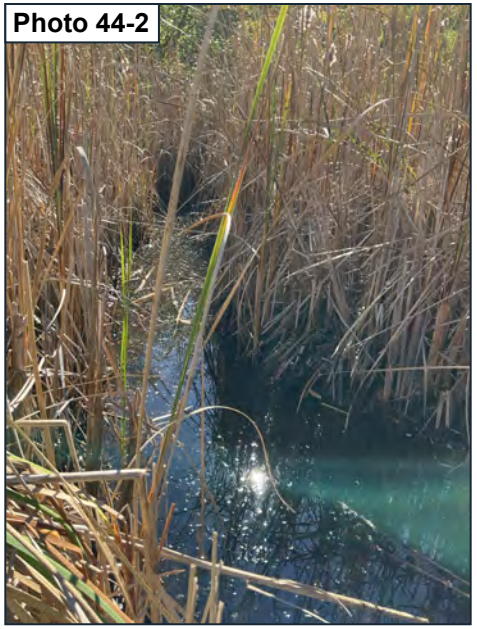


Photo caption: Looking Upstream at Probable Beaver Slide

Photo Locations Overview

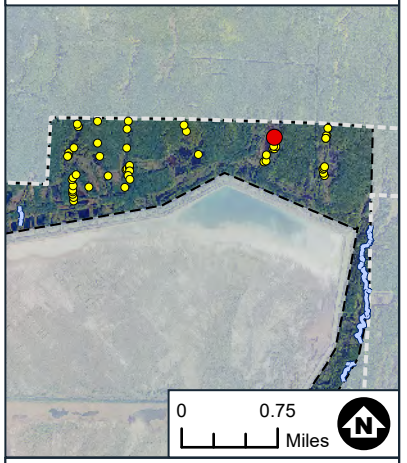
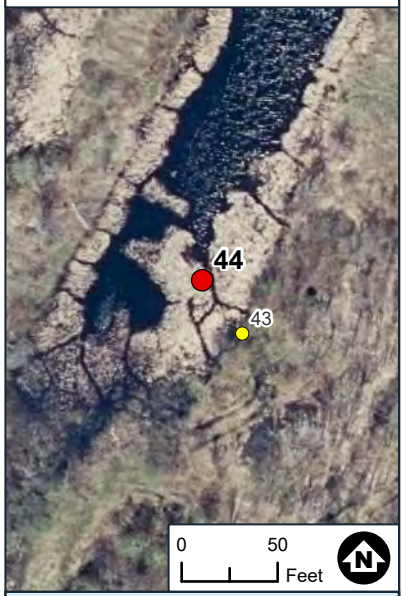


Photo 44 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Miles Creek Reach: NA

Photo 45-1



Photo caption: Soft Ground from Impoundment Backwater

Photo Locations Overview

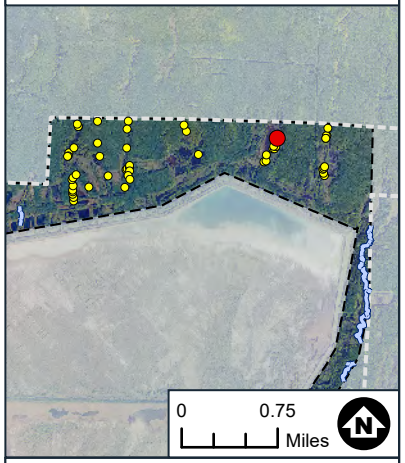
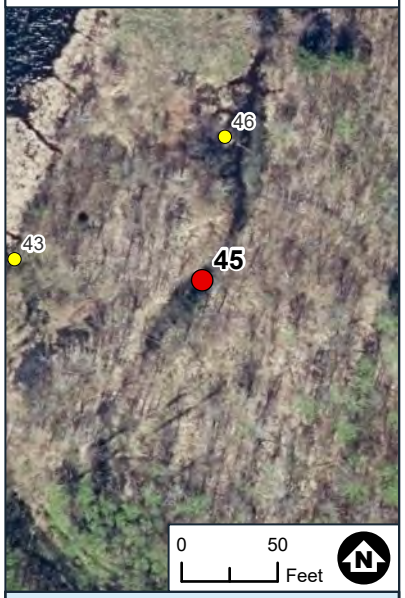


Photo 45 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Miles Creek Reach: NA

Photo 46-1



Photo caption: Backwater from Impoundment

Photo Locations Overview

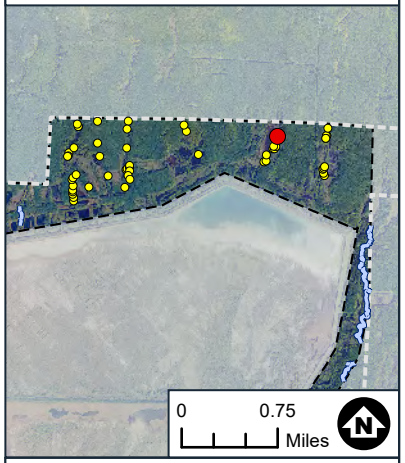


Photo 46 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Stony Creek Reach: NA

Photo 47-1



Photo caption: Looking at Wetland

Photo Locations Overview

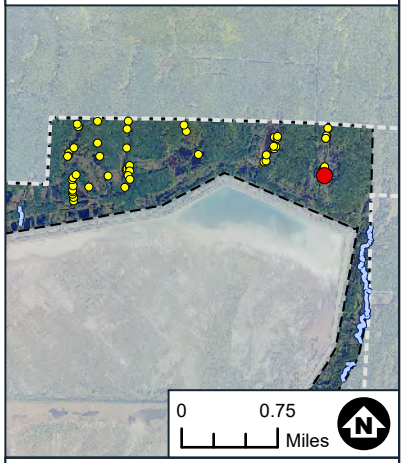


Photo 47 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Stony Creek Reach: NA

Photo 48-1



Photo caption: Dry Valley, No Channel

Photo 48-2



Photo caption: Dry Valley, No Channel

Photo 48-3



Photo caption: Dry Valley, No Channel

Photo Locations Overview

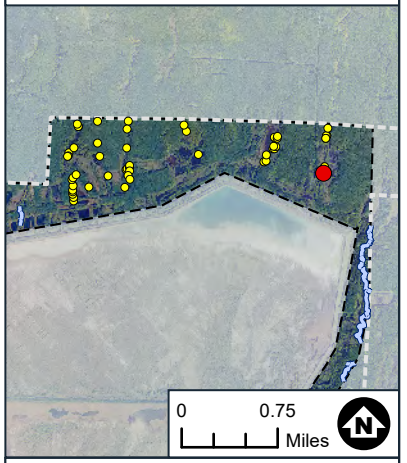
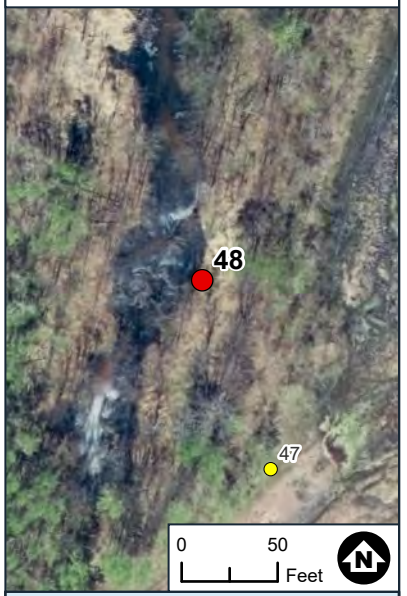


Photo 48 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Stony Creek Reach: NA

Photo 49-1



Photo caption: Disconnected Pond, No Visible Inlet or Outlet

Photo Locations Overview

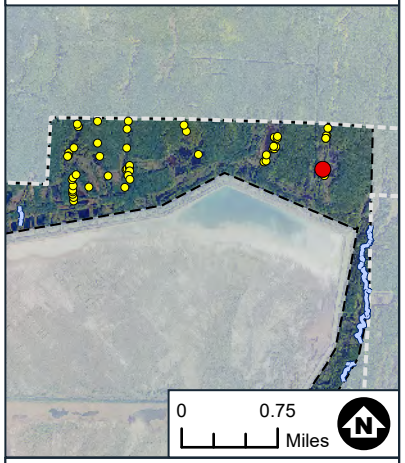
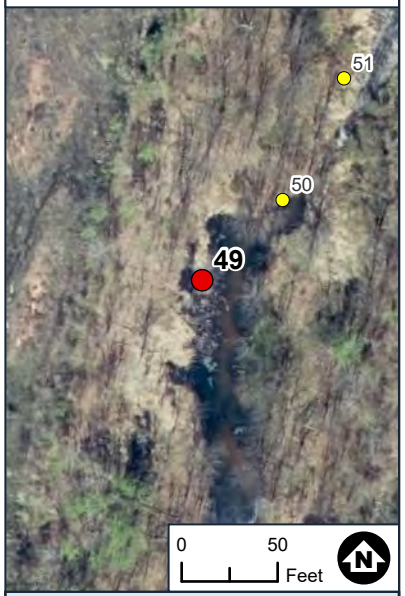


Photo 49 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Stony Creek Reach: NA

Photo 50-1



Photo caption: Backwater from Wetland

Photo Locations Overview

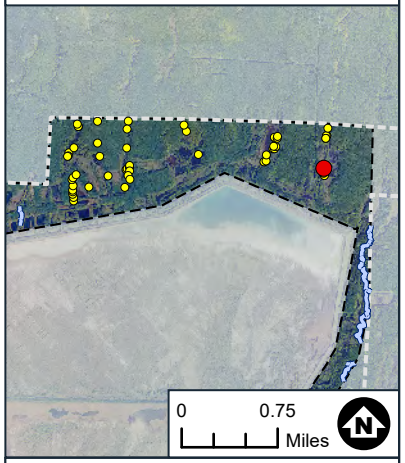
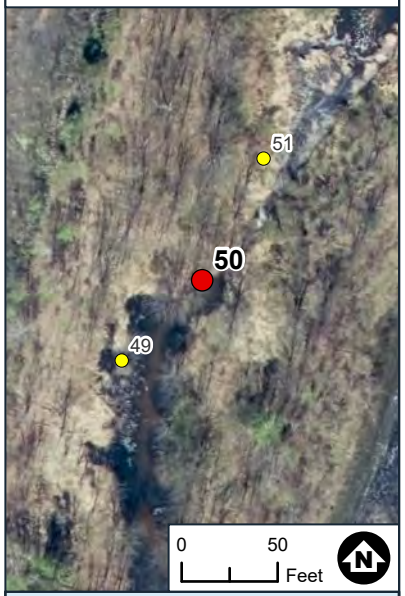


Photo 50 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Stony Creek Reach: NA

Photo 51-1



Photo caption: Backwater from Wetland

Photo Locations Overview

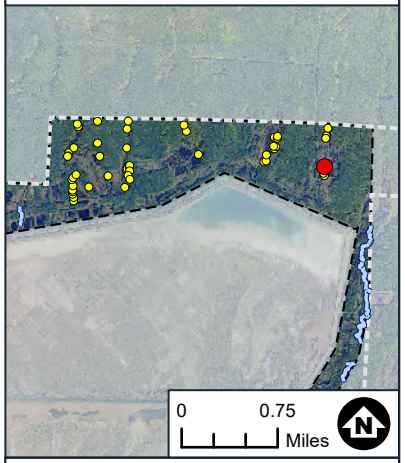
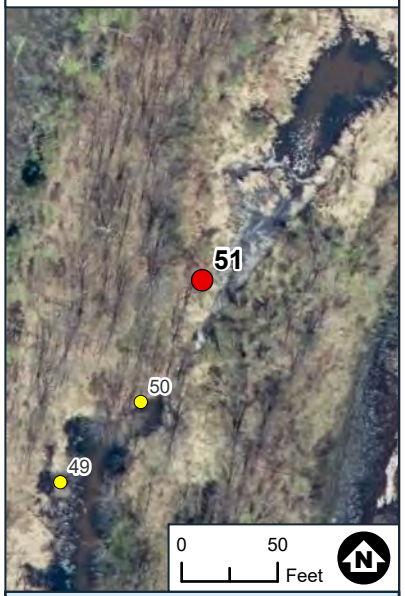


Photo 51 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Stony Creek Reach: NA

Photo 52-1



Photo caption: Looking Upstream at Impoundment

Photo Locations Overview

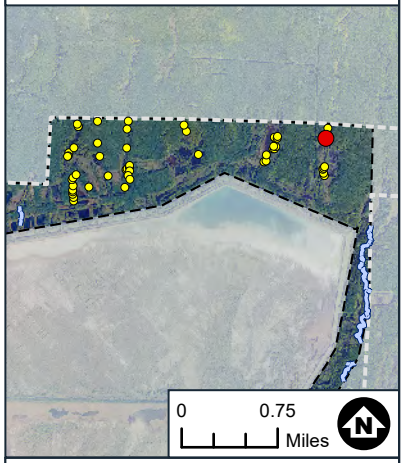


Photo 52 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Stony Creek Reach: NA

Photo 53-1



Photo caption: Looking Downstream from Dam

Photo Locations Overview

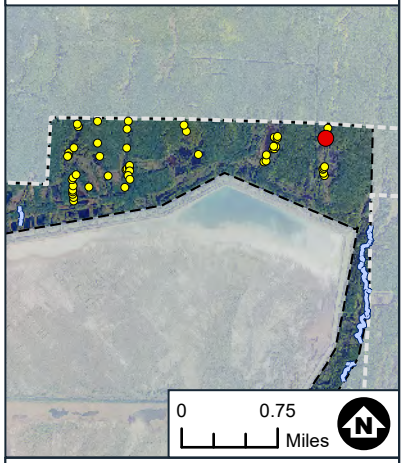


Photo 53 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Stony Creek Reach: NA

Photo 54-1



Photo caption: Looking Upstream at Dam

Photo Locations Overview

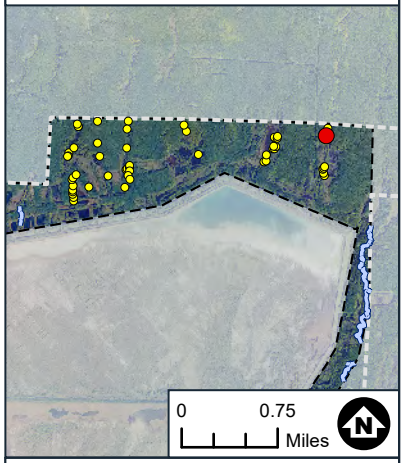
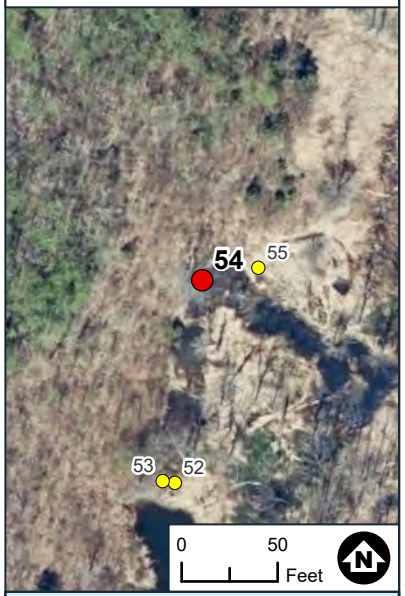


Photo 54 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Stony Creek Reach: NA

Photo 55-1



Photo caption: Cattails in Water from Impoundment Seepage

Photo Locations Overview

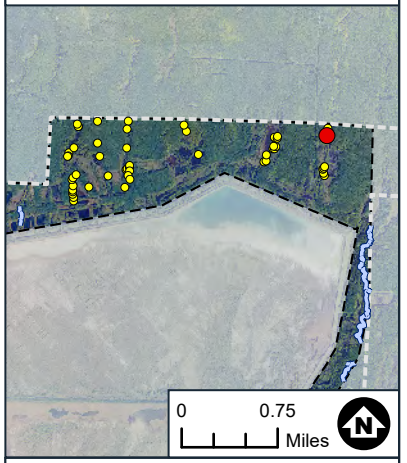
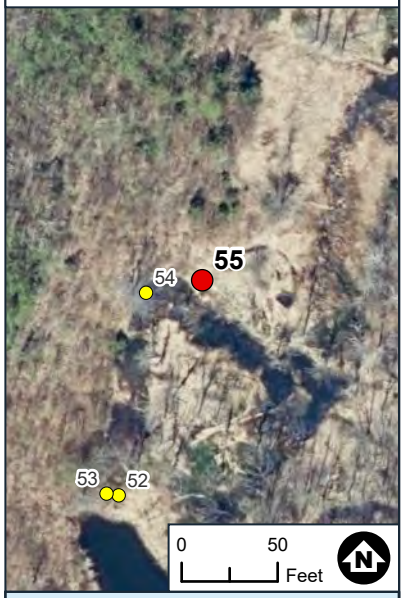


Photo 55 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

Creek Name: Stony Creek Reach: NA

Photo 56-1



Photo caption: Cattails in Water from Impoundment Seepage

Photo 56-2



Photo caption: Cattails in Water from Impoundment Seepage

Photo 56-3



Photo caption: Cattails in Water from Impoundment Seepage

Photo Locations Overview

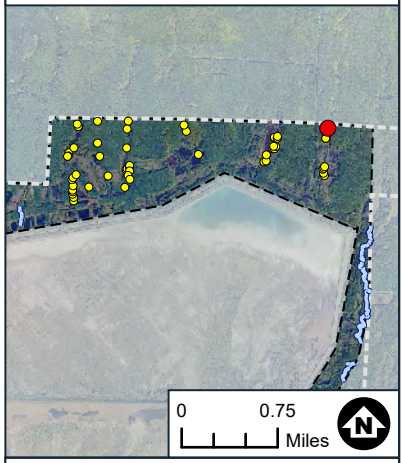


Photo 56 Location



Stream Survey
Photo Log
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

BARR

E-5

2025 Wetland Delineation

2025 Wetland Delineation

White Pine North Project, Carp Lake Township, Ontonagon County, Michigan

Prepared for
White Pine Copper, LLC.

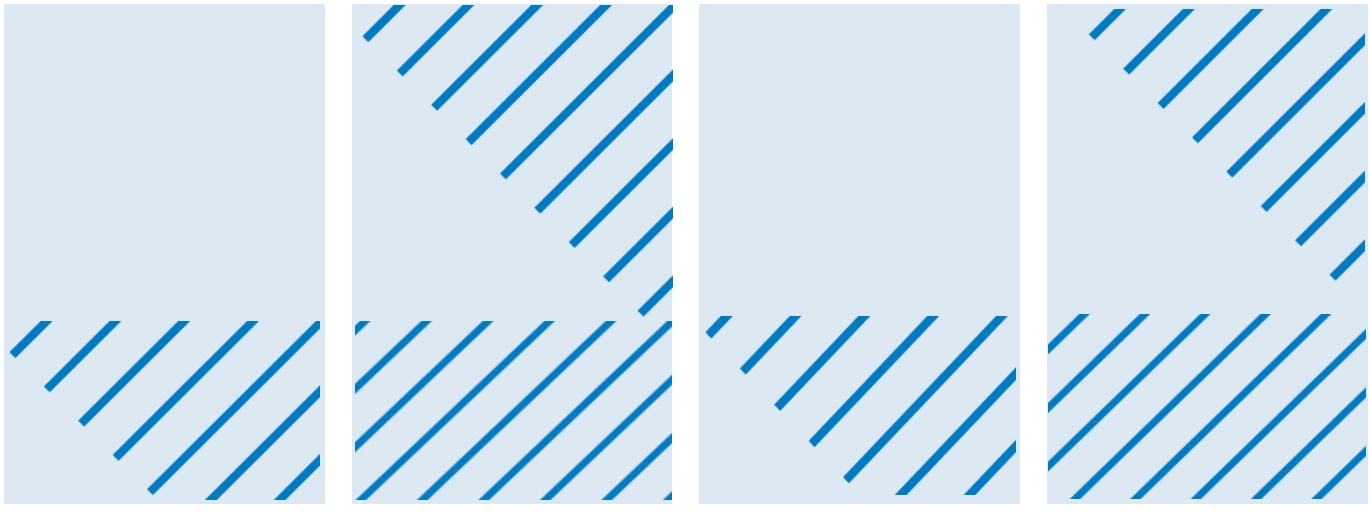
Prepared by
Barr Engineering Michigan, LLC.

March 20, 2026

22661013.01

3033 Orchard Vista Drive SE, Suite 200
Grand Rapids, MI 49546
616.512.7000

barr.com



2025 Wetland Delineation

White Pine North Project

March, 2026

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Appendix C	Wetland Delineation Photolog

1 Introduction

1.1 Study Purpose

In 2024, Barr Engineering Co. (Barr) was retained by White Pine Copper, LLC (WPC) to delineate wetlands within an area of approximately 1,030 acres of the White Pine North (WPN) facility located in Carp Lake Township, Ontonagon County, Michigan (Figure 1). The results of that 2024 field effort were reported in March 2025 (ref. (1)). As part of that 2024 field effort, additional land was identified at WPN that was outside of the 2024 review area but within the footprint of anticipated work by WPC. In response, Barr's operational subsidiary, Barr Engineering Michigan, LLC, was retained by WPC for additional wetland delineation work within this area, excluded from the 2024 effort so that a more holistic delineation of wetlands is available to inform WPC's planning of the WPN facility. This report is therefore a supplement to the 2024 report for the purpose of documenting the 2025 wetland delineation and characterization activities at WPN.

1.2 Survey Area

The 2025 additional wetland delineation Survey Area includes an approximately 131-acre portion of the White Pine North facility, located adjacent to the southwestern portion of the 2024 area of investigation (Figure 2). Surrounding land uses and cover types include forest and former mining facilities. The dominant land uses and cover types within the Survey Area consist of fallow, excavated borrow areas, wetlands, open water, upland forest and scrub-brush, and several utility and roadway corridors. A portion of Portal Creek is also located within the Survey Area.

2 Desktop Review

Barr conducted a desktop review to evaluate aerial imagery, topography, soil types, and mapped wetlands within the Survey Area prior to the wetland delineation. As part of this review, Barr staff accessed resources such as the Natural Resources Conservation Service (NRCS) Web Soil Survey (WSS) Soil Units (ref. (3)) shown on Figure 3, the National Wetlands Inventory (ref. (4)) shown on Figure 4, and aerial photography. This reference data was utilized by field teams to identify gaps and inconsistencies that needed to be addressed as part of the field surveys. The reference data also informed field teams where potential locations and types of wetland habitat that could be encountered within the Survey Area.

3 Methodology

The wetland delineation was conducted in a manner consistent with the Corps of Engineers Wetlands Delineation Manual (ref. (5)) and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region (ref. (6)).The wetland delineation procedures outlined in these manuals require the evaluation of on-site vegetation, soils, and hydrologic characteristics. Site observations are described in the Sections 4 and 5 below. The wetland boundaries were flagged in the field with alphanumerically labeled pink pin flags and/or pink flagging tape. Flagging was located using a Global Positioning System (GPS) unit capable of sub-meter accuracy.

4 Results

The Survey Area contains 30 additional wetlands and an extension of three 2024 mapped wetlands, totaling approximately 15.19 acres of additional wetland (Figure 5, Appendix A). The majority of the acreage appears to be several complexes of ponded and non-ponded, excavated borrow pits, and drainages within 500 feet of, or contiguous to, multiple streams. Beaver (*Castor canadensis*) flooding activity influences most of the complexes outside of the water treatment facilities. Wetland types include riverine (R) and palustrine, or freshwater, ponded (PUB), emergent (PEM), scrub-shrub (PSS), and forested (PFO) habitats. The 2025 Study Area drains to the Mineral River and ultimately Lake Superior via Portal Creek.

4.1 Vegetation, Soil, and Hydrology

The Survey Area was historically disturbed at the landscape scale due to clearing and excavation to supply the neighboring tailings dams with material for earthen dams. Nearly every wetland area encountered showed evidence of, or was created directly by, past disturbance from any combination of impacts relating to timber harvesting, clearing, grading, and/or borrow pit excavation, in addition to past and current beaver activity. In these cases, the delineation followed procedures related to Atypical Situations within the Corps of Engineers Wetlands Delineation Manual (ref. (5)).

Dominant wetland vegetation identified within the wetlands includes species such as green ash, black ash, red maple, yellow birch, balsam poplar, pussy willow, Bebb's willow, meadow willow, Missouri River willow, speckled alder, shining willow, red-osier dogwood, cattail spp., reed canary grass, blue joint grass, fowl bluegrass, fowl manna grass, hairy panic grass, nodding sedge, Bebb's sedge, bladder sedge, Tuckerman's sedge, jewelweed, dwarf raspberry, giant goldenrod, sensitive fern, interrupted fern, ostrich fern, common horsetail, jointed rush, soft rush, duckweed, woolgrass, dark-green bullrush, soft-stemmed bulrush, American bur-reed, watershield, and floating pondweed. Primary and secondary hydrology indicators were identified throughout the wetlands areas. Due to the magnitude of previous disturbance, soils within many wetlands were not consistent with their WSS descriptions but did meet the parameters of a "man-induced wetland" as defined by the Corps of Engineers Wetlands Delineation Manual (ref. (5)).

In contrast, the adjacent upland areas included species such as eastern hemlock, sugar maple, bigtooth aspen, quaking aspen, ironwood, white pine, paper birch, white spruce, red elderberry, wild sarsaparilla, bracken fern, lady fern, thimble berry, red raspberry, blackberry, Canada mayflower, Queen Anne's lace, Kentucky bluegrass, tall fescue, smooth brome, Virginia strawberry, bird's-foot trefoil, common Timothy, red clover, white clover, sweet clover spp., Canada thistle, bull thistle, and tall goldenrod with no observed evidence of wetland hydrology or soils.

Figure 5 depicts an overview of the approximate location of the wetland areas encountered on-site. Additional details are provided in the appendices including:

- Appendix A: Wetland Delineation Detail Mapbook;
- Appendix B: U.S. Army Corps of Engineers (USACE) Wetland Data Forms; and
- Appendix C: Wetland Delineation Photolog.

4.2 Water Treatment/Stormwater Facilities

Several water treatment/stormwater facilities were constructed to manage outfall and stormwater from the historic mining facilities permitted under point-source discharge permitting regulations. The areas were included in a Michigan Department of Environment, Great Lakes, and Energy (EGLE) Wetland Identification Report and determined by EGLE to not be regulated wetland (ref. (7)). Within the 2025 Study Area, Wetland (WTL) 283 is part of the stormwater management system that is eventually discharged through a National Pollution Discharge Elimination System (NPDES) outfall at Perch Creek.

4.3 Wetland Functional Value (MiRAM)

Barr performed a MiRAM assessment at four wetland areas representing both disturbed and relatively undisturbed wetlands within the 2024 Survey Area and reported that data in the 2024 summary wetland report (ref. (1)). These wetlands included ponded/beaver-managed, previously cleared/excavated, riverine, and forested wetland habitat types. None of the assessed wetlands met high-quality wetland criteria through the narrative rating. Although not required by standard procedure or rule, this added context may be useful in permitting discussions as to the general character, function, and value typical of potentially impacted wetlands. For the additional wetlands reported herein, the 2024 MiRAM evaluation is considered an appropriate analog and no additional MiRAM analysis of the 2025 wetlands was warranted. The 2024 MiRAM summary scores are provided in Table 1 through Table 4 with full details of the assessments, including field datasheets and rankings, provided in the 2024 summary wetland report (ref. (1)).

Table 1 2024 MiRAM 1 - Forested

Metric		Wetland Score	Potential Score (Max.)
Metric 1	Wetland Size and Distribution	8	9
Metric 2	Upland Buffers and Intensity of Surrounding Land Use	12	12
Metric 3	Hydrology	20	26
Metric 4	Habitat Alteration and Habitat Structure Development	16	20
Metric 5	Special Situations	10	10
Metric 6	Vegetation, Interspersion, and Habitat Features	20	20
Metric 7	Scenic, Recreational, and Cultural Value	0	3
	Seasonally Adjusted Score	0	10
	Grand Total	**86**	**100**

Table 2 2024 MiRAM 2 - Riverine

Metric		Wetland Score	Potential Score (Max.)
Metric 1	Wetland Size and Distribution	8	9
Metric 2	Upland Buffers and Intensity of Surrounding Land Use	12	12
Metric 3	Hydrology	22	26
Metric 4	Habitat Alteration and Habitat Structure Development	14	20
Metric 5	Special Situations	0	10
Metric 6	Vegetation, Interspersion, and Habitat Features	20	20
Metric 7	Scenic, Recreational, and Cultural Value	0	3
	Seasonally Adjusted Score	0	10
	Grand Total	**76**	**100**

Table 3 2024 MiRAM 3 - Beaver Impounded

Metric		Wetland Score	Potential Score (Max.)
Metric 1	Wetland Size and Distribution	8	9
Metric 2	Upland Buffers and Intensity of Surrounding Land Use	12	12
Metric 3	Hydrology	22	26
Metric 4	Habitat Alteration and Habitat Structure Development	14	20
Metric 5	Special Situations	0	10
Metric 6	Vegetation, Interspersion, and Habitat Features	17	20
Metric 7	Scenic, Recreational, and Cultural Value	0	3
	Seasonally Adjusted Score	0	10
	Grand Total	**73**	**100**

Table 4 2024 MiRAM 4 - Previously Excavated

Metric		Wetland Score	Potential Score (Max.)
Metric 1	Wetland Size and Distribution	8	9
Metric 2	Upland Buffers and Intensity of Surrounding Land Use	12	12
Metric 3	Hydrology	14	26
Metric 4	Habitat Alteration and Habitat Structure Development	7	20
Metric 5	Special Situations	0	10
Metric 6	Vegetation, Interspersion, and Habitat Features	8	20
Metric 7	Scenic, Recreational, and Cultural Value	0	3
	Seasonally Adjusted Score	0	10
	Grand Total	**49**	**100**

5 Conclusions

5.1 Jurisdiction

Based on observations of topography, vegetation, soil, and indicators of hydrology, Barr has determined that an additional 15.19 acres of wetland habitat is present in the Survey Area. According to Part 303, Wetlands Protection, of the Michigan NREPA, 1994 PA 451, as amended (Part 303), and Michigan's assumption of Section 404 of the Clean Water Act, wetlands regulated by the State of Michigan include wetlands that are:

1. Located within 500 feet of, or having a direct surface water connection to, an inland lake, pond, river, or stream; or
2. Greater than 5 acres in size; or
3. Located within 1,000 feet of, or having a direct surface water connection to, the Great Lakes or Lake St. Clair; or
4. A water of the United States, as that term is used in section 502(7) of the Federal Water Pollution Control Act, 33 USC 1362; or
5. Known to have a documented presence of an endangered or threatened species under Part 365 of State of Michigan 1994 PA 451, as amended or the Federal Endangered Species Act of 1973, Public Law 93-205; or
6. Rare or imperiled.

For the wetlands identified herein, 29 wetlands and the continuations of the three wetlands previously identified in the 2024 survey appear to be regulated by EGLE as they are within 500 feet or have direct surface water connection to Portal Creek, a feature meeting the definition of a "stream" for these purposes.

In contrast, one wetland (WTL 283) appears to be part of a water treatment/stormwater facility. As further described in Section 4.2, these wetland types are exempt from EGLE regulation as wetlands as they have been constructed and operated in compliance with the requirements of state or federal water pollution control laws.

5.2 Regulatory Authority

EGLE, and in some coastal cases USACE, have regulatory authority regarding the wetland boundary location(s) and jurisdictional status of wetlands in the State of Michigan. Barr's wetland determination was performed in general accordance with accepted procedures for conducting wetland determinations.

Barr's conclusions reflect our professional opinion based on the site conditions within the Survey Area observed during the site visits. Discrepancies may arise between current and future wetland determinations and delineations due to changes in vegetation and/or hydrology as the result of land use practices or other environmental factors, whether on-site or on adjacent or nearby properties. Barr provides no warranty, guarantee, or other agreement in respect to the period of time for which this wetland determination will remain valid.

6 References

1. **Barr Engineering Co.** *2024 Wetland Delineation and Characterization Report, White Pine North Project, Carp Lake Township, Ontonagon County, Michigan.* Grand Rapids, Michigan : Barr Engineering Co., 2024. 22661013.00.

2. —. *2024 Stream Characterization Report.* Carp Lake Township : Barr Engineering Co, 2025.

3. **United States Department of Agriculture, Natural Resources Conservation Service (NRCS).** Web Soil Survey. [Online] [Cited: June 21, 2024.] https://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm.

4. **National Wetlands Inventory.** *Surface Waters and Wetlands.* [Online] U.S. Fish and Wildlife Service, National Standards and Support Team, Wetlands. [Cited: June 21, 2024.] https://fwsprimary.wim.usgs.gov/wetlands/apps/wetlands-mapper/.

5. **U.S. Army Corps of Engineers.** Corps of Engineers Wetlands Delineation Manual. 1987. Wetlands Research Program Technical Report Y-87-1 (on-line edition).

6. **U.S. Army Corps of Engineers (USACE).** Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region (Version 2.0). [ed.] R.W. Lichvar, C.B. Noble, and J.F. Berkowitz Ed. J.S. Wakeley. Vicksburgh, MS : U.S. Army Engineer Research and Development Center, January 2012. ERDC/EL TR-12-1.

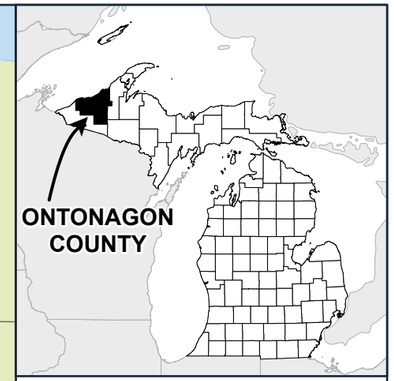
7. **Michigan Department of Environment, Great Lakes, and Energy.** *Wetland Identification Report, MiEnviro Site Name: 66-White Pine Copper-Carp Lake Twp.* Lansing, Michigan : s.n., 2025. MiEnviro Submission No. HQ6-65JR-KA16Y.

8. **Michigan Department of Natural Resources and Environment.** Michigan Rapid Assessment Method for Wetlands: User's Manual. July 23, 2010. MiRAM Version 2.1.

9. **Michigan Department of Natural Resources and Environment Land and Water Management Division.** Michigan Rapid Assessment Method for Wetlands (MiRAM) Rating Form. July 23, 2010. MiRAM Version 2.1.

10. **Lichvar, R.W., D.L. Banks, W.N. Kirchner, and N.C. Melvin. 2016.** The National Wetland Plant List: 2016 Wetland Ratings (NWPL). *U.S. Army Corps of Engineers Digital Library.* [Online] April 28, 2016. [Cited: March 7, 2025.] https://usace.contentdm.oclc.org/digital/collection/p266001coll1/id/3540/.

Figures



Survey Area

Apx. Limit of Underground Mine Area

Porcupine Mountains Wilderness State Park

Municipal Boundary

County Boundary

0 5 10

Miles

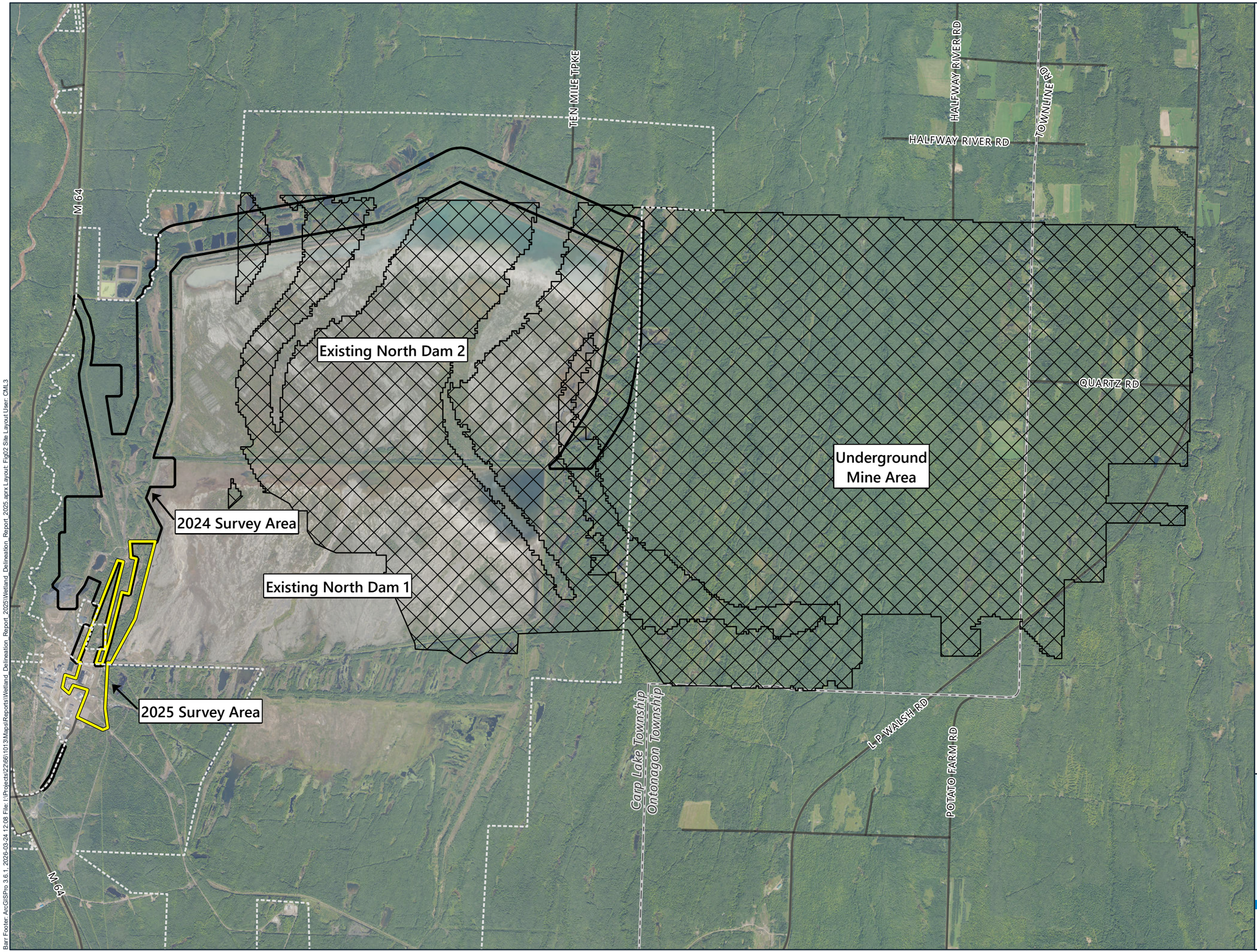
Basemap: World Street Map (Esri)

Site Location
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

FIGURE 1

BARR

Barr Footer: ArcGISPro 3.6.1 2026-03-24 12:08 File: I:\Projects\22\66\1013\Maps\Reports\Wetland_Delineation_Report_2025\Wetland_Delineation_Report_2025.aprx Layout: Fig01 Site Location User: CML3



2025 Survey Area

2024 Survey Area

Apx. Limit of Underground Mine Area

Surface Rights Extent

N

0 3,000 6,000

Feet

Imagery: USDA NAIP 2022

Site Layout
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

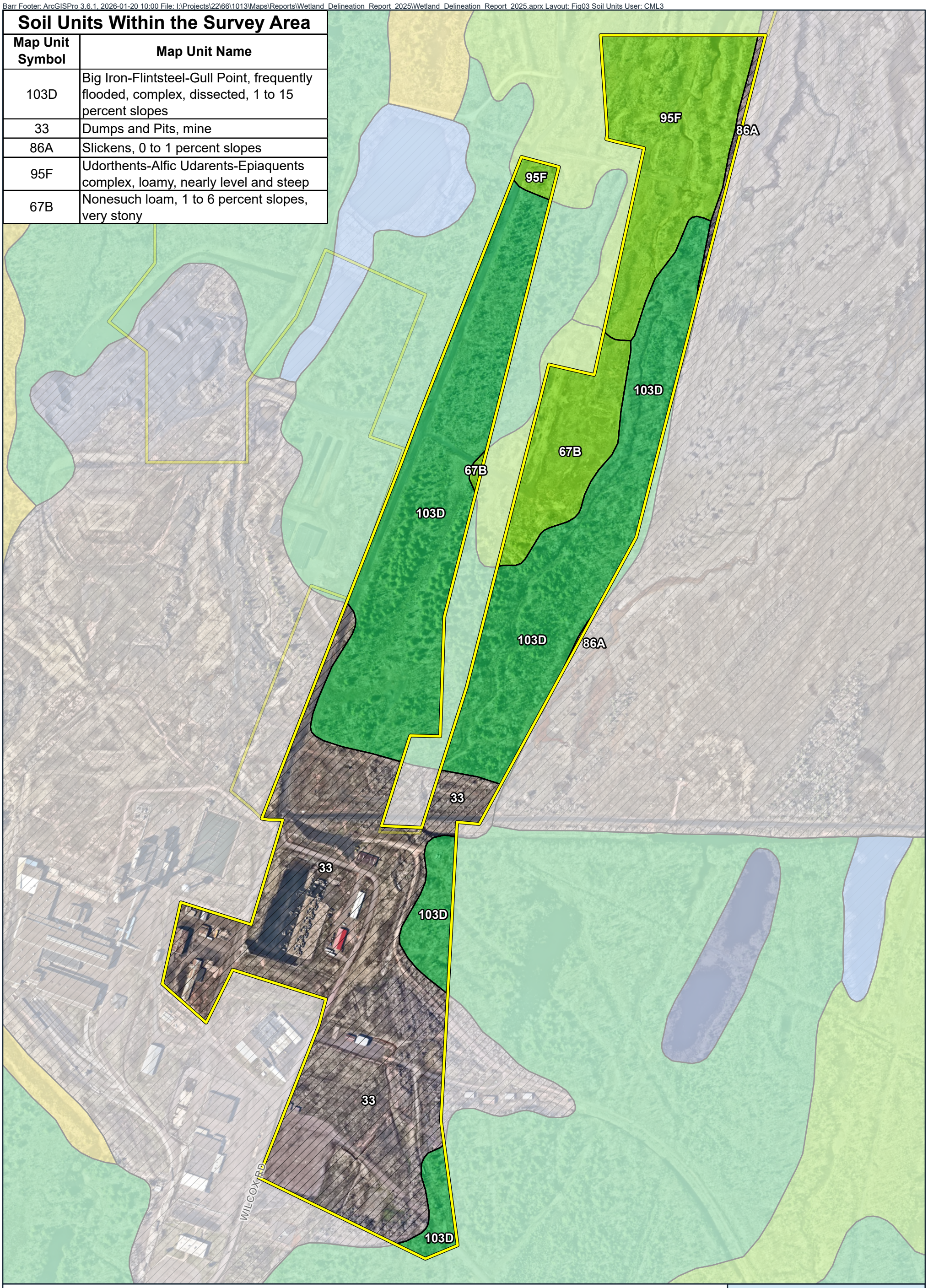
FIGURE 2

BARR

Barr Foster ArcGISPro 3.6.1, 2026-03-24 12:08 File: I:\Projects\22\66\1013\Maps\Reports\Wetland_Delineation_Report_2025\Wetland_Delineation_Report_2025.aprx Layout: Fig02 Site Layout User: CML3

Soil Units Within the Survey Area

Map Unit Symbol	Map Unit Name
103D	Big Iron-Flintsteel-Gull Point, frequently flooded, complex, dissected, 1 to 15 percent slopes
33	Dumps and Pits, mine
86A	Slickens, 0 to 1 percent slopes
95F	Udorthents-Alfic Udarents-Epiaquents complex, loamy, nearly level and steep
67B	Nonesuch loam, 1 to 6 percent slopes, very stony



2025 Survey Area
2024 Survey Area
Soil Unit
Water

Soil Drainage Class
Well drained
Moderately well drained
Somewhat poorly drained
Very poorly drained
NA

Imagery: Nearmap 4/30/2025

N

0 450 900
Feet

Soil Units
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, MI

FIGURE 3

BARR

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2025 Survey Area
2024 Survey Area
Wetlands (NWI)
Freshwater Pond
Lake
Riverine

Imagery: Nearmap 4/30/2025

N

0 450 900
Feet

National Wetlands Inventory
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, MI
FIGURE 4

BARR



2025 Survey Area
2024 Survey Area
Wetland Area
Wetland Area (Water Treatment Facility)

Imagery: Nearmap 4/30/2025

N

0 450 900
Feet

2025 Wetland Delineation Overview
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, MI
FIGURE 5

BARR

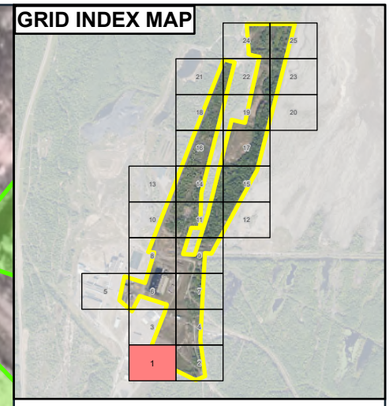
Appendices

Appendix A

2025 Wetland Delineation Detail Map



GRID INDEX MAP



- 2025 Survey Area
- 2024 Survey Area
- Wetland Area
- Field Delineated Wetland Boundary
- × Wetland Flag

0 65 130
Feet

Imagery: MiSAIL 2023

2025 Wetland Delineation
- Detail Map -
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, MI

BARR

Barr Footer: ArcGISPro 3.6.1, 2026-01-20 09:59 File: I:\Projects\22\66\1013\Maps\Reports\Wetland_Delineation_Report_2025\Wetland_Delineation_Maptbook_2025.aprx Layout: 2025 Wetland Delineation Detail Maptbook User: CML3



GRID INDEX MAP

- 2025 Survey Area
- 2024 Survey Area
- Wetland Area
- Field Delineated Wetland Boundary
- × Wetland Flag

0 65 130
Feet

Imagery: MiSAIL 2023

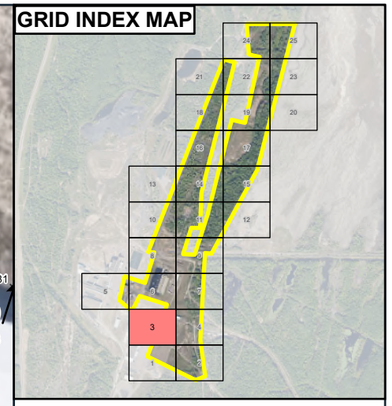
2025 Wetland Delineation
- Detail Map -
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, MI

BARR

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GRID INDEX MAP



- 2025 Survey Area
- 2024 Survey Area
- Wetland Area
- Field Delineated Wetland Boundary
- × Wetland Flag

0 65 130
Feet

Imagery: MiSAIL 2023

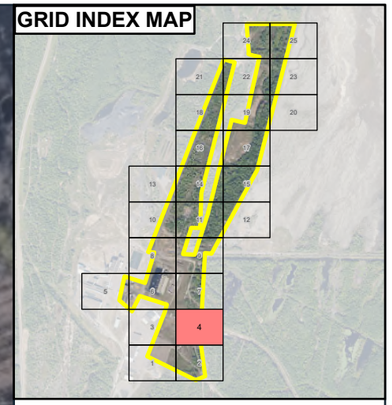
2025 Wetland Delineation
- Detail Map -
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, MI

BARR

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GRID INDEX MAP



2025 Survey Area

2024 Survey Area

Wetland Area

Field Delineated Wetland Boundary

× Wetland Flag

0 65 130

Feet

Imagery: MiSAIL 2023

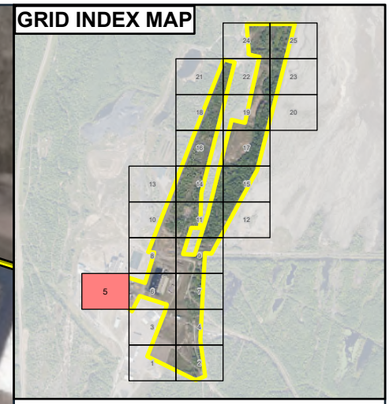
2025 Wetland Delineation
- Detail Map -
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, MI

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GRID INDEX MAP



2025 Survey Area

2024 Survey Area

Wetland Area

× Wetland Flag

0 65 130

Feet

Imagery: MiSAIL 2023

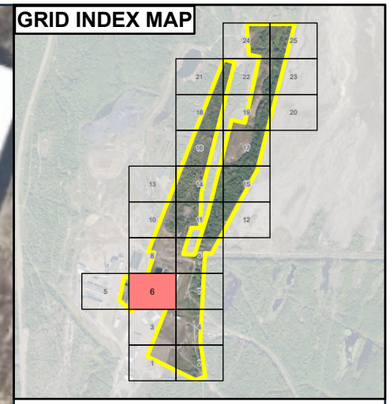
2025 Wetland Delineation
- Detail Map -
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, MI

BARR

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GRID INDEX MAP



- 2025 Survey Area
- 2024 Survey Area
- Wetland Area
- Field Delineated Wetland Boundary
- × Wetland Flag

N

0 65 130

Feet

Imagery: MiSAIL 2023

2025 Wetland Delineation
- Detail Map -
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, MI

BARR

Barr Footer: ArcGISPro 3.6.1, 2026-01-20 09:59 File: I:\Projects\22\66\1013\Maps\Reports\Wetland_Delineation_Report_2025\Wetland_Delineation_Mapbook_2025.aprx Layout: 2025 Wetland Delineation Detail Mapbook User: CML3

Wetland 283
0.35 acres

283-2
283-3

Wetland 281
0.14 acres

281-6
281-5
281-7
281-4
281-8
281-9
281-10
281-3
281-2
281-1
281-11

Wetland 279
< 0.01 acres

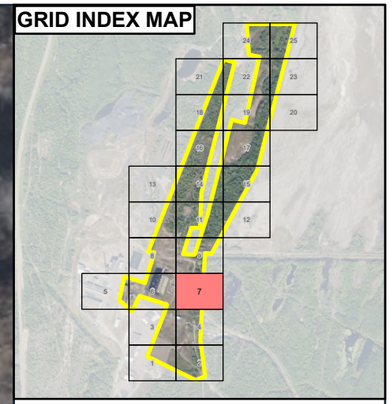
279-3
279-2
279-1
279-4

Wetland 277
0.12 acres

277-6
277-5
277-9
277-4
277-3
277-2
277-7
277-8
277-10
277-11
277-12
277-13 OPEN
277-1 OPEN

Outside of Survey Area

GRID INDEX MAP



2025 Survey Area
2024 Survey Area
Wetland Area
Field Delineated Wetland Boundary
× Wetland Flag

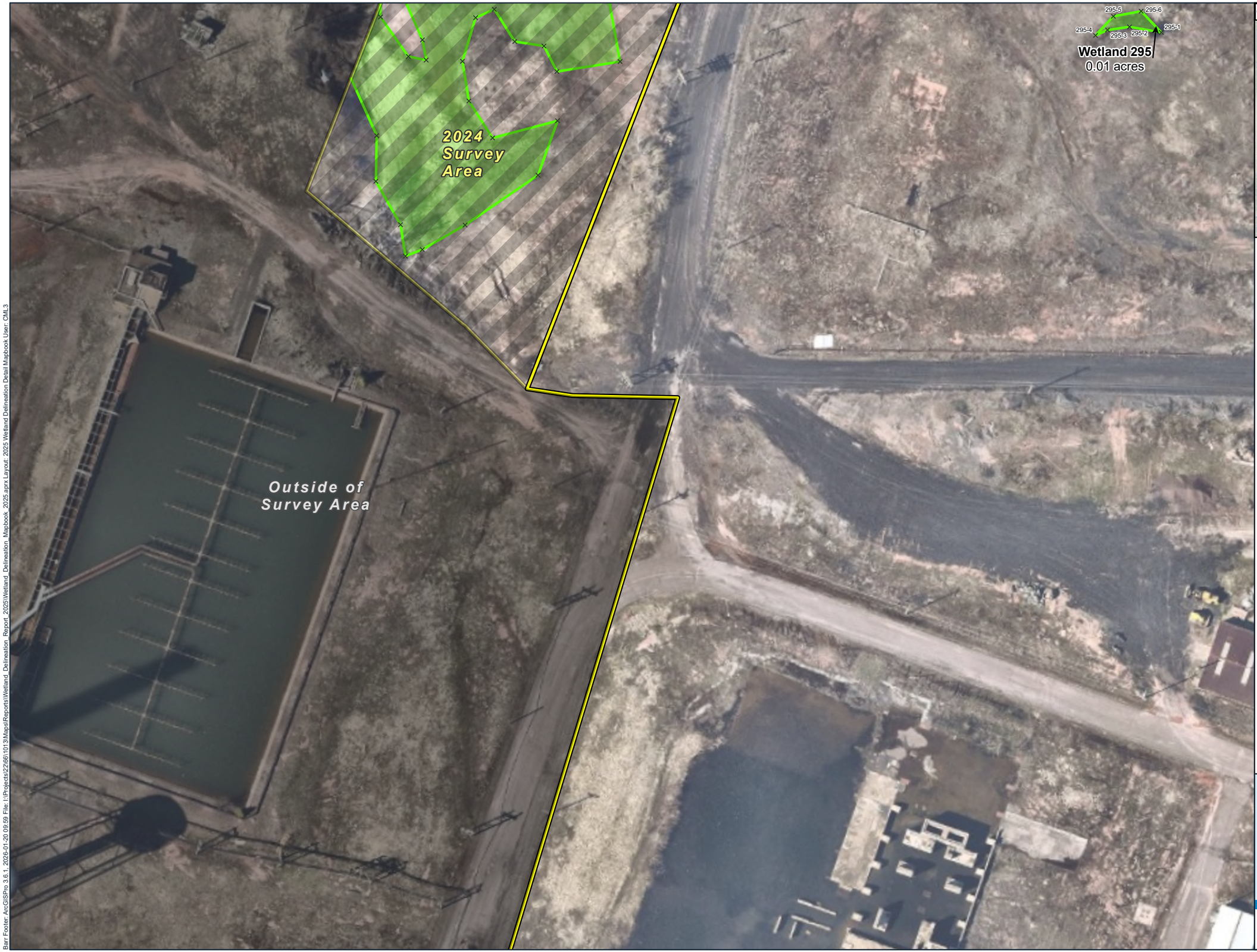
0 65 130
Feet

Imagery: MiSAIL 2023

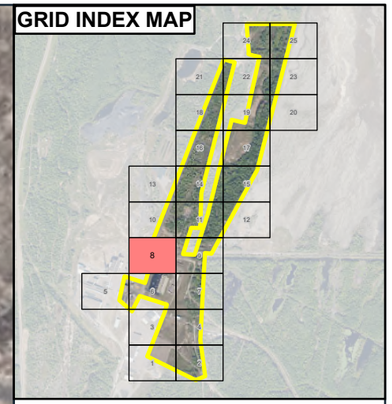
2025 Wetland Delineation
- Detail Map -
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, MI

BARR

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GRID INDEX MAP



2025 Survey Area

2024 Survey Area

Wetland Area

Field Delineated Wetland Boundary

× Wetland Flag

0 65 130

Feet

Imagery: MiSAIL 2023

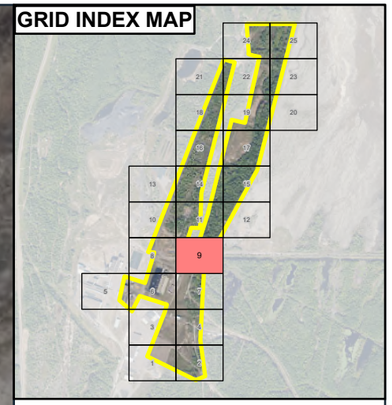
2025 Wetland Delineation
- Detail Map -
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, MI

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GRID INDEX MAP



- 2025 Survey Area
- 2024 Survey Area
- Wetland Area
- Field Delineated Wetland Boundary
- × Wetland Flag

N

0 65 130
Feet

Imagery: MiSAIL 2023

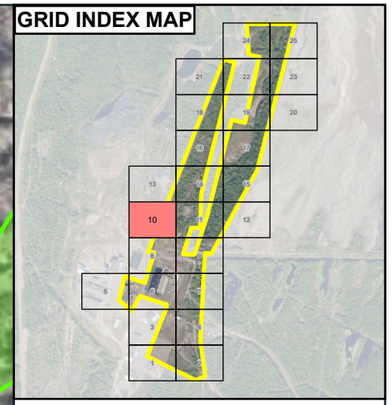
2025 Wetland Delineation
- Detail Map -
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, MI

BARR

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GRID INDEX MAP



- 2025 Survey Area
- 2024 Survey Area
- Wetland Area
- Field Delineated Wetland Boundary
- × Wetland Flag

N

0 65 130

Feet

Imagery: MiSAIL 2023

2025 Wetland Delineation
- Detail Map -
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, MI

BARR

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Wetland 11
8 acres

Wetland 3
22.56 acres

Wetland 3/11
7.41 acres

Wetland 299
0.12 acres

Wetland 278
0.01 acres

Wetland 295
0.01 acres

2024 Survey Area

Outside of Survey Area

297-7 297-6 297-5 11B-45 11B-46 11B-47 11B-48 11B-49 11B-50

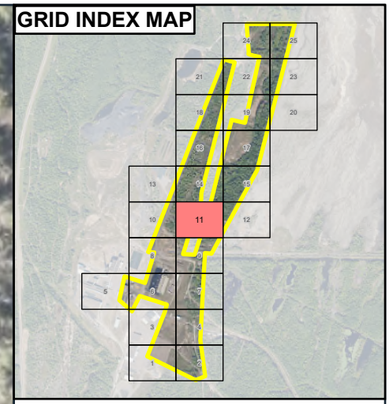
3B-500 3B-501 3B-195 3B-196 3B-197 3B-198 3B-199 3B-201 3B-207 3B-200 3B-18 3B-17 3B-16 3B-15 3B-14 3B-13 3B-12 3B-11 3B-10 3B-194 3B-193 3B-192 3B-9 3B-188 OPEN 3B-191 3B-189 3B-190 3B-8 3B-7 3B-6 3B-187 3B-186 3B-5 3B-185 3B-184

299-11 299-12 299-10 299-14 299-13 299-1 299-9 299-8 299-2 299-3 299-4 299-7 299-5 299-6

278-5 278-6 278-4 278-7 278-3 278-1 278-2

295-1

GRID INDEX MAP



2025 Survey Area
2024 Survey Area
Wetland Area
Field Delineated Wetland Boundary
× Wetland Flag

N

0 65 130
Feet

Imagery: MiSAIL 2023

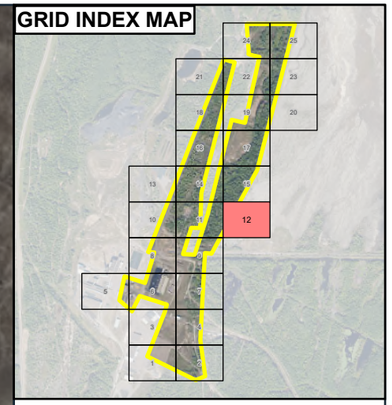
2025 Wetland Delineation
- Detail Map -
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, MI

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GRID INDEX MAP



- 2025 Survey Area
- 2024 Survey Area
- Wetland Area
- Field Delineated Wetland Boundary
- × Wetland Flag

0 65 130
Feet

Imagery: MiSAIL 2023

2025 Wetland Delineation
- Detail Map -
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, MI

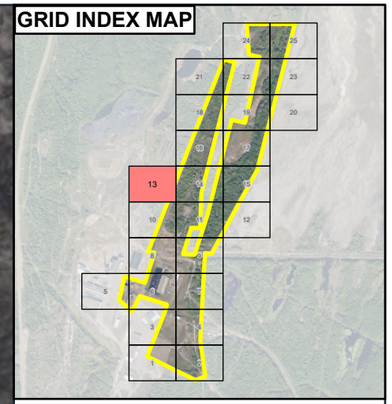
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Outside of Survey Area

2024 Survey Area

GRID INDEX MAP



2025 Survey Area

2024 Survey Area

Wetland Area

Field Delineated Wetland Boundary

× Wetland Flag

N

0 65 130

Feet

Imagery: MiSAIL 2023

2025 Wetland Delineation
- Detail Map -
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, MI

PAGE 13 OF 25

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Outside of Survey Area

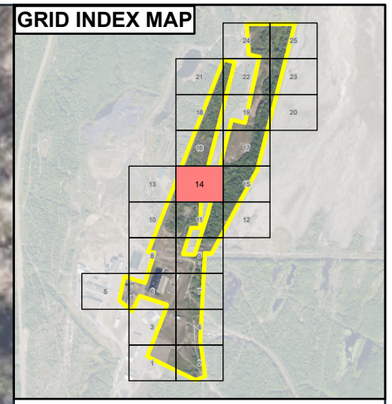
11B-34
11B-35
297-14
11B-36
Wetland 11
8 acres
11B-37
297-13
11B-38
297-12
11B-39
11B-40
297-11
11B-41
297-10
11B-42
297-9
11B-43
297-8
11B-44
297-7
11B-45

2024 Survey Area

290-4
290-3
290-5
290-6
Wetland 290
0.01 acres
290-7
290-1

3B-212
3B-211
Wetland 3/11
7.41 acres
3B-24
3B-23
3B-210
3B-22
3B-21
3B-209
3B-20
3B-202
3B-206
3B-205
3B-203
3B-204
Wetland 3
22.56 acres
3B-208
3B-19
3B-13
3B-201
3B-207
3B-200
3B-199

GRID INDEX MAP



2025 Survey Area
2024 Survey Area
Wetland Area
Field Delineated Wetland Boundary
× Wetland Flag

0 65 130
Feet

Imagery: MiSAIL 2023

2025 Wetland Delineation
- Detail Map -
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, MI

BARR

Barr Footer: ArcGISPro 3.6.1, 2026-01-20 09:59 File: I:\Projects\22\66\1013\Maps\Reports\Wetland_Delineation_Report_2025\Wetland_Delineation_Mapbook_2025.aprx Layout: 2025 Wetland Delineation Detail Mapbook User: CML3

Wetland 7
0.16 acres

Wetland 3/11
7.41 acres

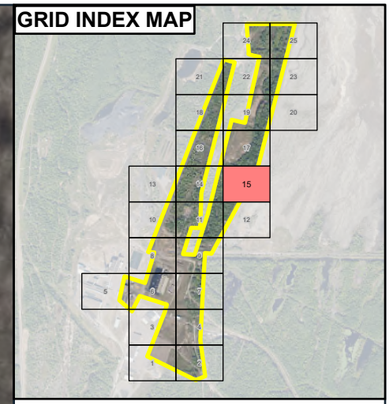
Wetland 289
0.01 acres

Wetland 290
0.01 acres

Wetland 287
< 0.01 acres

Outside of
Survey Area

GRID INDEX MAP



2025 Survey Area
2024 Survey Area
Wetland Area
Field Delineated Wetland Boundary
× Wetland Flag

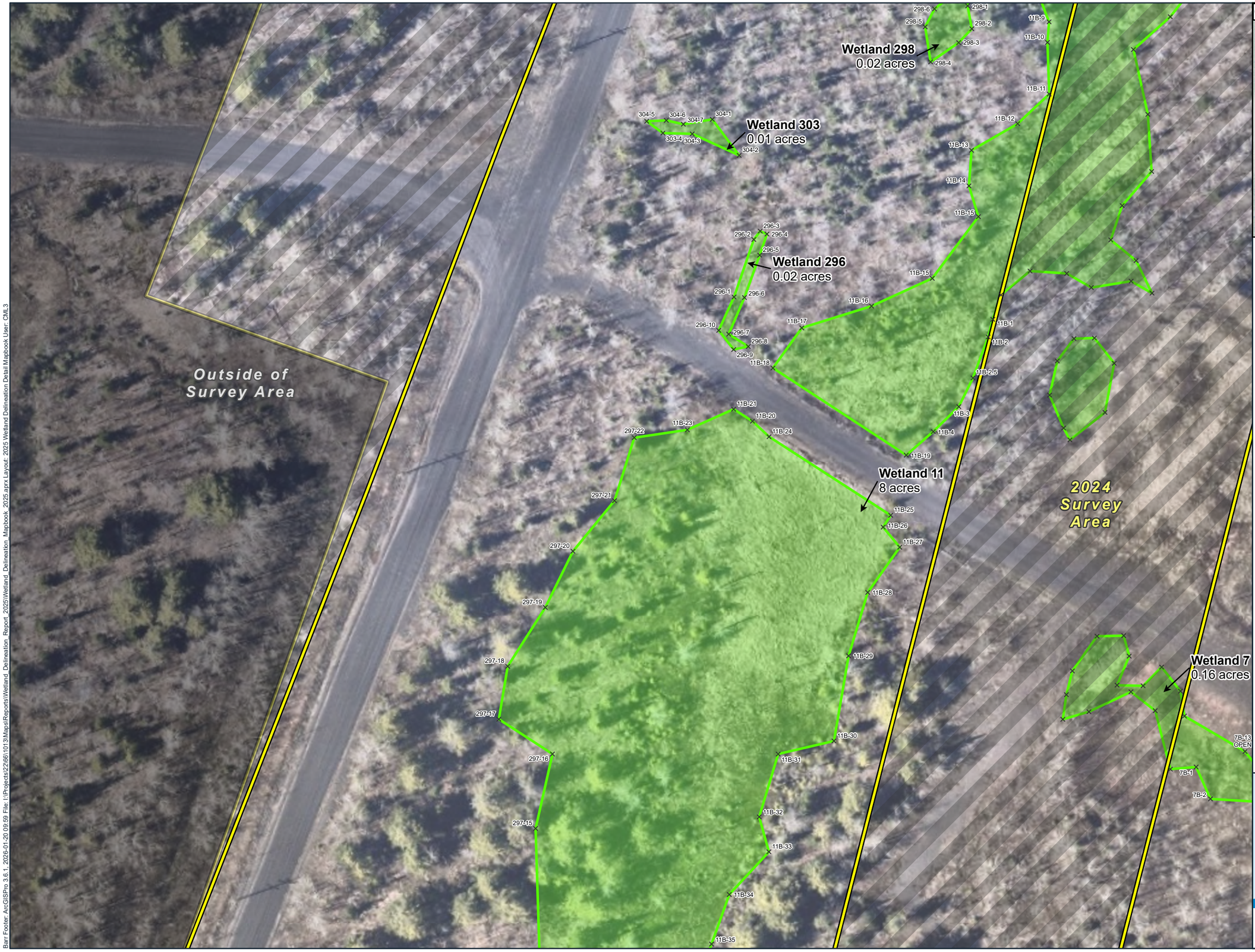
0 65 130
Feet

Imagery: MiSAIL 2023

2025 Wetland Delineation
- Detail Map -
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, MI

BARR

Barr Footer: ArcGISPro 3.6.1, 2026-01-20 09:59 File: I:\Projects\23\66\1013\Maps\Reports\Wetland_Delineation_Report_2025\Wetland_Delineation_Mapbook_2025.aprx Layout: 2025 Wetland Delineation Detail Mapbook User: CML3



2025 Survey Area
2024 Survey Area
Wetland Area
Field Delineated Wetland Boundary
× Wetland Flag

0 65 130
Feet

Imagery: MiSAIL 2023

2025 Wetland Delineation
- Detail Map -
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, MI

BARR

Barr Footer: ArcGISPro 3.6.1, 2026-01-20 09:59 File: I:\Projects\23\66\1013\Maps\Reports\Wetland_Delineation_Report_2025\Wetland_Delineation_Mapbook_2025.aprx Layout: 2025 Wetland Delineation Detail Mapbook User: CML3

Wetland 11
8 acres

Wetland 288
0.08 acres

Wetland 284
0.04 acres

Wetland 286
0.02 acres

Wetland 3/11
7.41 acres

Wetland 7
0.16 acres

Wetland 285
0.01 acres

2024 Survey Area

Outside of Survey Area

GRID INDEX MAP

2025 Survey Area
2024 Survey Area
Wetland Area
Field Delineated Wetland Boundary
Wetland Flag

0 65 130
Feet

Imagery: MiSAIL 2023

2025 Wetland Delineation
- Detail Map -
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, MI

BARR

Barr Footer: ArcGISPro 3.6.1, 2026-01-20 09:59 File: I:\Projects\22\66\1013\Maps\Reports\Wetland_Delineation_Report_2025\Wetland_Delineation_Mapbook_2025.aprx Layout: 2025 Wetla

Outside of Survey Area

2024 Survey Area

Wetland 293
0.01 acres
293-1
293-2
293-3
293-4

Wetland 294
0.01 acres
294-1
294-2
294-3
294-4

Wetland 11
8 acres
11-166.5

Wetland 302
0.01 acres
302-1
302-2
302-3
302-4

Wetland 300
< 0.01 acres
300-1
300-2
300-3
300-4
300-5

Wetland 298
0.02 acres
298-1
298-2
298-3
298-4
298-5
298-6
298-7
298-8

11B-8
11B-9
11B-10

GRID INDEX MAP

2025 Survey Area
2024 Survey Area
Wetland Area
Field Delineated Wetland Boundary
× Wetland Flag

N

0 65 130
Feet

Imagery: MiSAIL 2023

2025 Wetland Delineation
- Detail Map -
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, MI

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BARR

Barr Footer: ArcGISPro 3.6.1 2026-01-20 09:59 File: I:\Projects\22\66\1013\Maps\Reports\Wetland_Delineation_Report_2025\Wetland_Delineation_Mapbook_2025.aprx Layout: 2025 Wetland Delineation Detail Mapbook User: CML3

Wetland 11
8 acres

Outside of Survey Area

2024 Survey Area

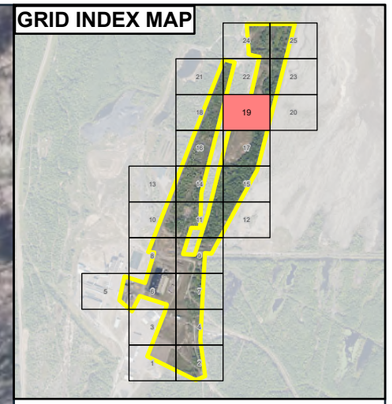
Wetland 280
< 0.01 acres

Wetland 3/11
7.41 acres

Wetland 288
0.08 acres

3B-95 3B-81 3B-82 3B-80 3B-83 3B-270 3B-79 3B-84 3B-90 3B-269 3B-78 3B-85 3B-89 3B-75 3B-86 280-3 3B-77 3B-88 280-2 3B-87 280-1 280-4 3B-268 3B-74 3B-241 3B-240 3B-73 3B-72 3B-69 3B-70 3B-68 3B-71 3B-242 3B-267 3B-243 3B-67 3B-239 3H-66 3B-244 3B-238 3B-65 3B-245 3B-237 3B-64 3B-266 3B-63 3B-236 3B-246 3B-62 3B-235 3B-61 3B-265 3B-60 3B-264 3B-247 3B-234 3B-59 3B-58 3B-263 3B-248 3B-233 3B-262 3B-249 3B-57 3B-250 3B-251 3B-261 3B-56 3B-232 288-11 288-12

GRID INDEX MAP



2025 Survey Area
2024 Survey Area
Wetland Area
Field Delineated Wetland Boundary
× Wetland Flag

N

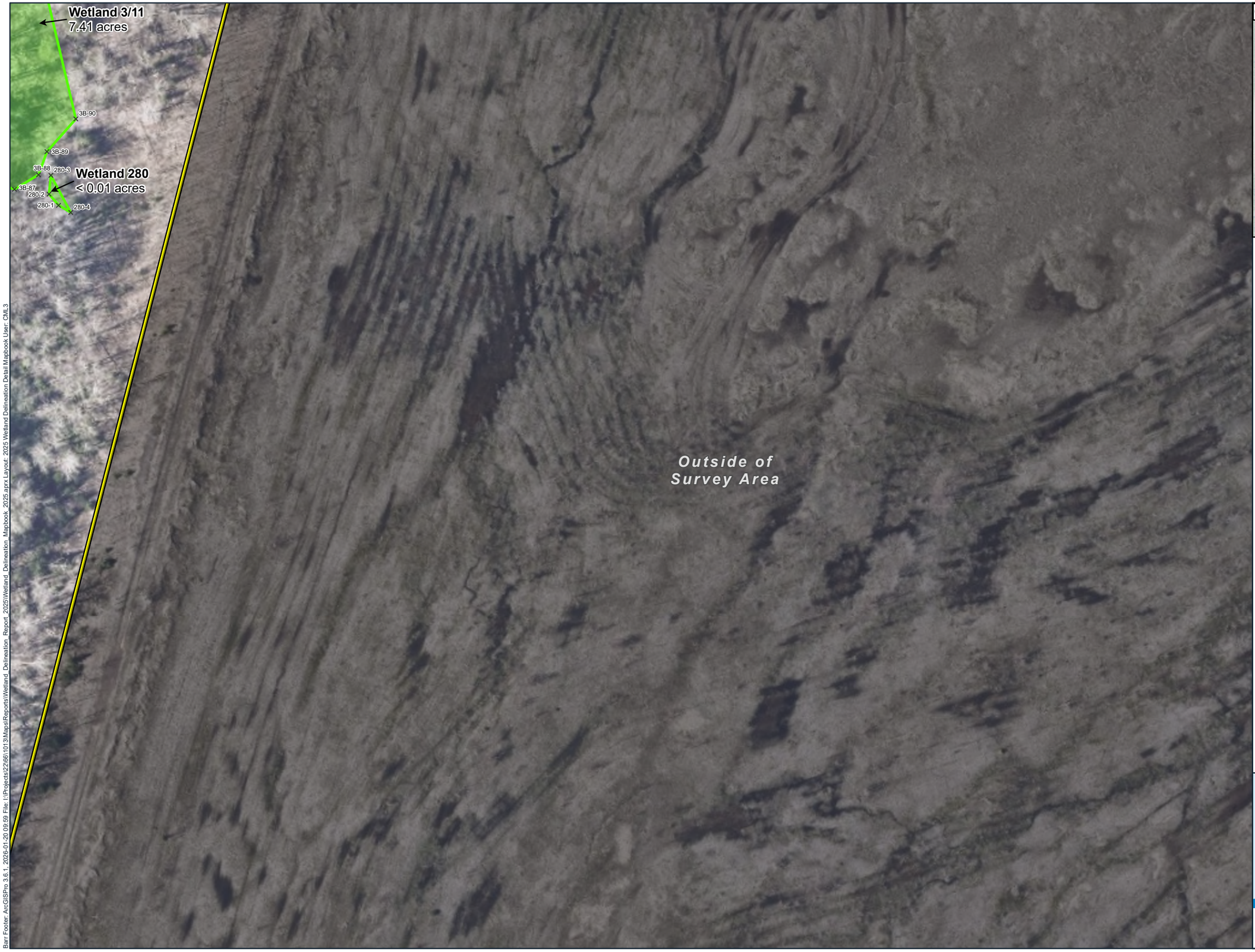
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Feet

Imagery: MiSAIL 2023

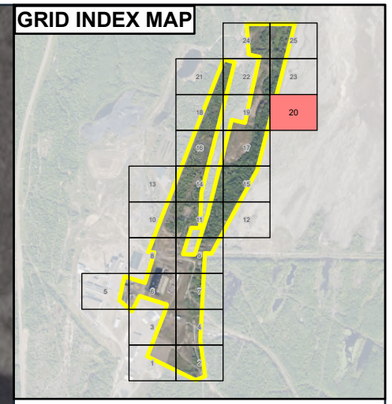
2025 Wetland Delineation
- Detail Map -
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, MI

BARR

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GRID INDEX MAP



2025 Survey Area
2024 Survey Area
Wetland Area
Field Delineated Wetland Boundary
× Wetland Flag

0 65 130
Feet

Imagery: MiSAIL 2023

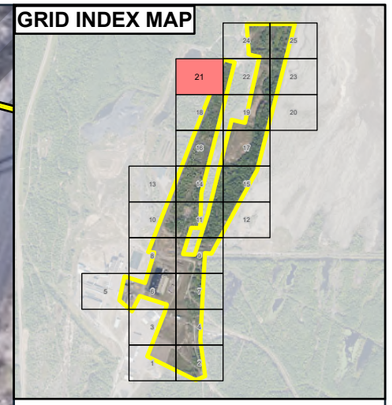
2025 Wetland Delineation
- Detail Map -
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, MI

BARR

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GRID INDEX MAP



- 2025 Survey Area
- 2024 Survey Area
- Wetland Area
- Field Delineated Wetland Boundary
- Desktop Delineated Wetland Boundary
- × Wetland Flag

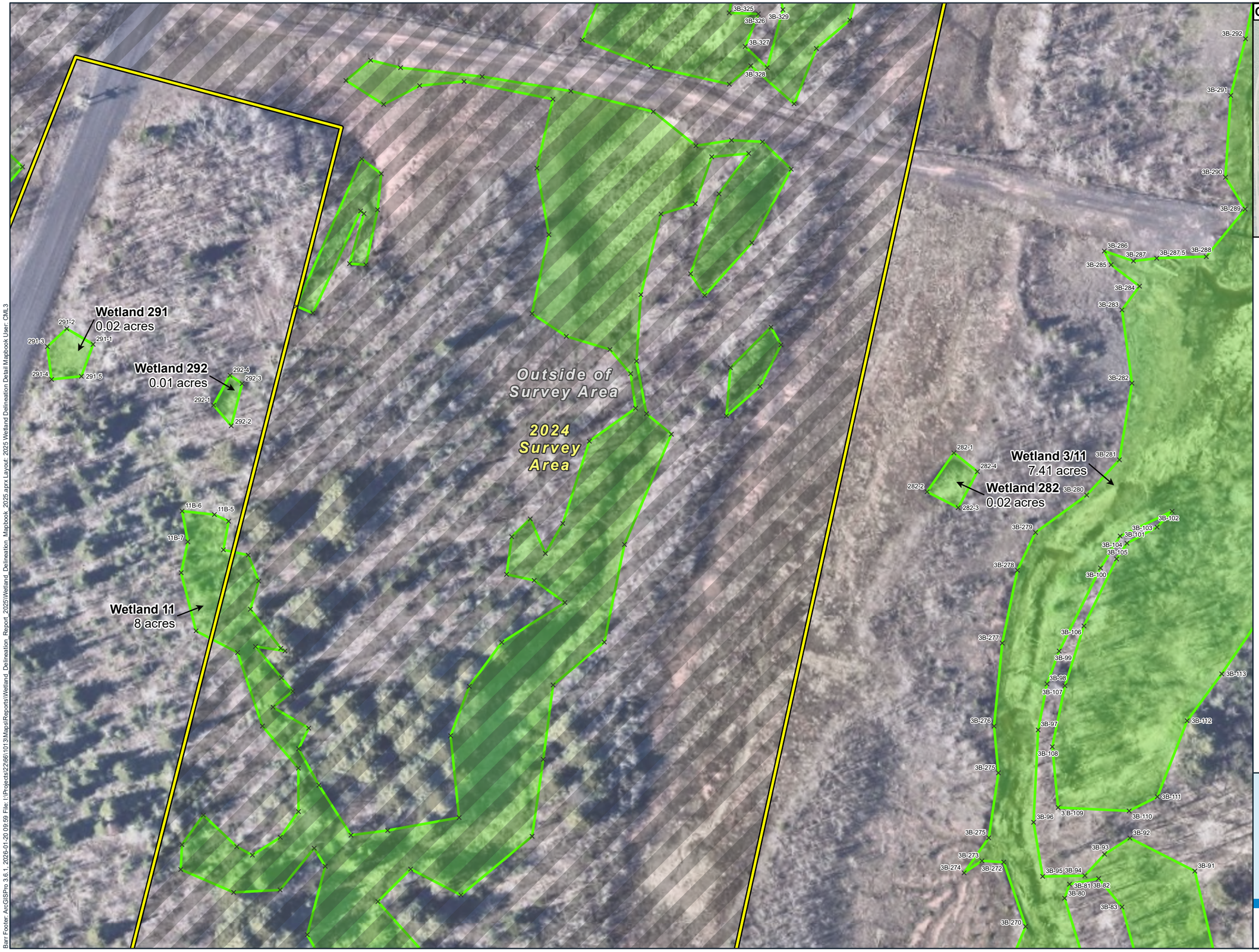
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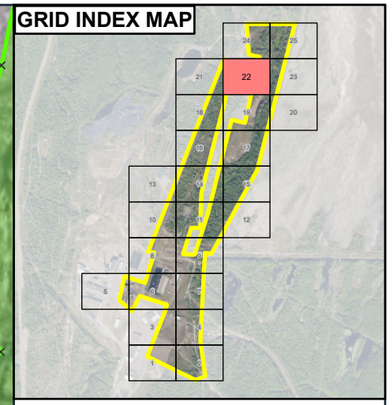
2025 Wetland Delineation
- Detail Map -
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, MI

BARR

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GRID INDEX MAP



- 2025 Survey Area
- 2024 Survey Area
- Wetland Area
- Field Delineated Wetland Boundary
- × Wetland Flag

0 65 130
Feet

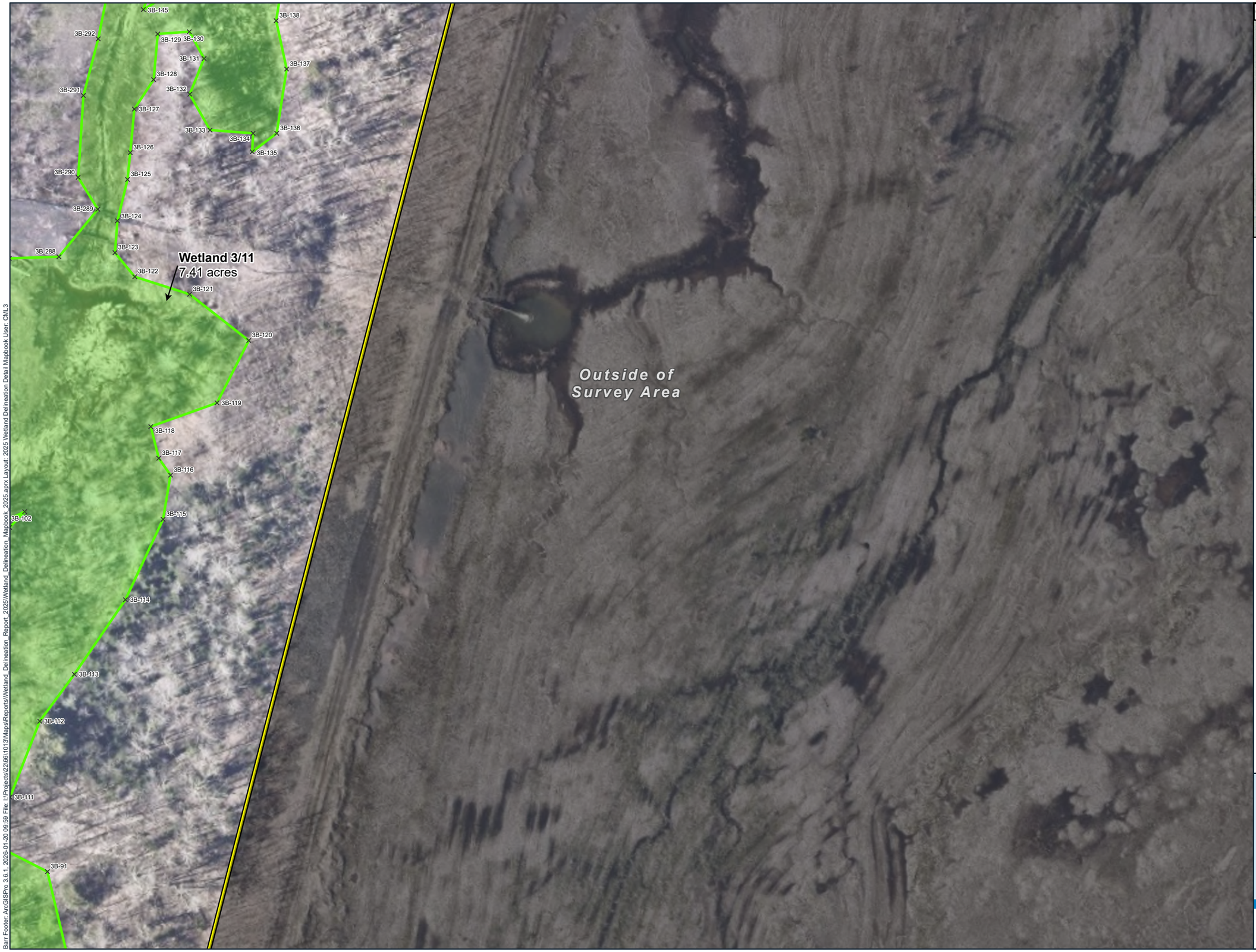
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2025 Wetland Delineation
- Detail Map -
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, MI

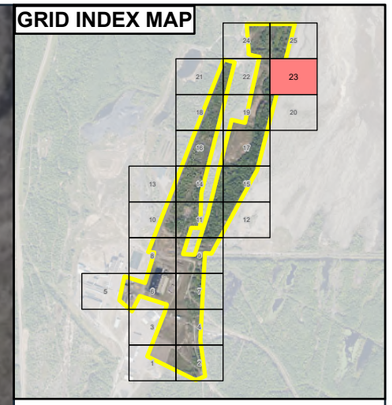
PAGE 22 OF 25

BARR

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GRID INDEX MAP



- 2025 Survey Area
- 2024 Survey Area
- Wetland Area
- Field Delineated Wetland Boundary
- × Wetland Flag

0 65 130
Feet

Imagery: MiSAIL 2023

2025 Wetland Delineation
- Detail Map -
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, MI

BARR

Barr Footer: ArcGISPro 3.6.1, 2026-01-20 09:59 File: I:\Projects\22366\1013\Maps\Reports\Wetland_Delineation_Report_2025\Wetland_Delineation_Mapbook_2025.aprx Layout: 2025 Wetland Delineation Detail Mapbook User: CML3

Wetland 11
8 acres

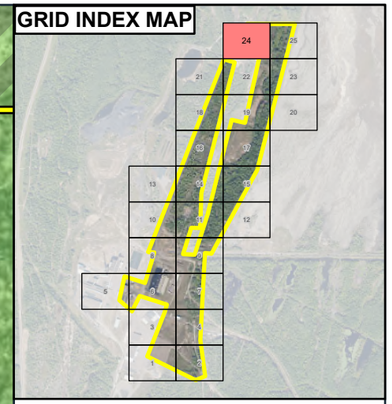
Wetland 3/11
7.41 acres

2024 Survey Area

Outside of Survey Area

3B-337 3B-338 3B-339 3B-340 3B-341 3B-342 3B-343 3B-344 3B-345 3B-347 3B-348 3B-349 3B-350 3B-351 3B-352 3B-353 3B-354 3B-355 3B-356 3B-357 3B-358 3B-359 3B-360 3B-361 3B-362 3B-363 3B-364 3B-365 3B-366 3B-367 3B-368 3B-369 3B-370 3B-371 3B-372 3B-373 3B-374 3B-375 3B-376 3B-377 3B-378 3B-379 3B-380 3B-381 3B-382 3B-383 3B-384 3B-385 3B-386 3B-387 3B-436 3B-296 3B-297 3B-298 3B-299 3B-300 3B-301 3B-302 3B-303 3B-304 3B-305 3B-306 3B-307 3B-308 3B-309 3B-310 3B-311 3B-312 3B-313 3B-314 3B-315 3B-316 3B-317 3B-318 3B-319 3B-319.5 3B-320 3B-321 3B-322 3B-324 3B-325 3B-326 3B-327 3B-328 3B-329 3B-330 3B-331 3B-332 3B-333 3B-334 3B-335 3B-336 3B-149 3B-150 3B-151 3B-152 3B-292

GRID INDEX MAP



2025 Survey Area
2024 Survey Area
Wetland Area
Field Delineated Wetland Boundary
× Wetland Flag

N

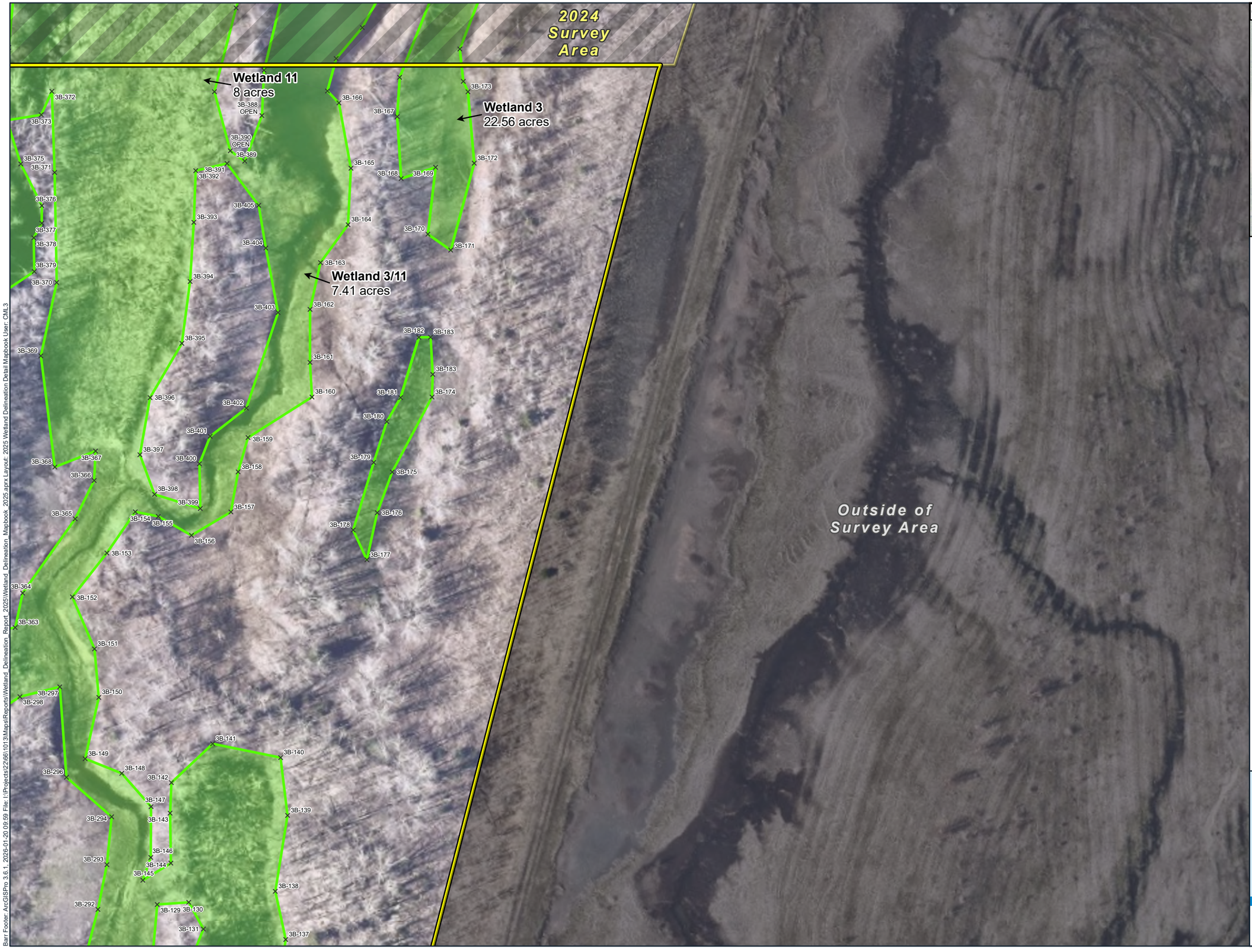
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Imagery: MiSAIL 2023

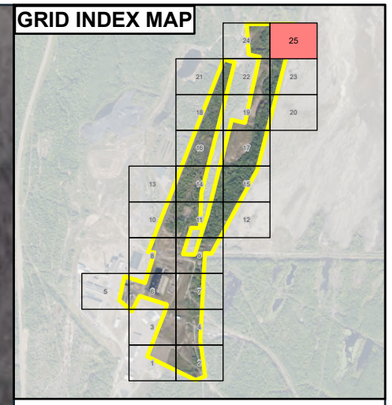
2025 Wetland Delineation
- Detail Map -
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, MI

BARR

Barr Footer: ArcGISPro 3.6.1, 2026-01-20 09:59 File: I:\Projects\22\66\101\3\Maps\Reports\Wetland_Delineation_Report_2025\Wetland_Delineation_Mapbook_2025.aprx Layout: 2025 Wetland Delineation Detail Mapbook User: CML3



GRID INDEX MAP



- 2025 Survey Area
- 2024 Survey Area
- Wetland Area
- Field Delineated Wetland Boundary
- × Wetland Flag

N

0 65 130

Feet

Imagery: MiSAIL 2023

2025 Wetland Delineation
- Detail Map -
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, MI

BARR

Barr Footer: ArcGISPro 3.6.1, 2026-01-20 09:59 File: I:\Projects\22\66\1013\Maps\Reports\Wetland_Delineation_Report_2025\Wetland_Delineation_Mapbook_2025.aprx Layout: 2025 Wetland Delineation Detail Mapbook User: CML3

Appendix B

U.S. Army Corps of Engineers (USACE) Wetland Data Forms

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Northcentral and Northeast Region
See ERDC/EL TR-12-1; the proponent agency is CECW-COR

OMB Control #: 0710-0024, Exp: 09/30/2027
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: White Pine | City/County: Ontonagon County | Sampling Date: 2025-08-18

Applicant/Owner: White Pine North | State: Michigan | Sampling Point: WTL-267-DP1U

Investigator(s): Gage Kriese | Section, Township, Range: sec 04 T050N R042W

Landform (hillside, terrace, etc.): Rise | Local relief (concave, convex, none): Convex | Slope %: 0-2

Subregion (LRR or MLRA): LRR K, MLRA 92 | Lat: 46.764095 | Long: -89.564848 | Datum: WGS84

Soil Map Unit Name: Dumps and Pits, mine | NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ✓, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ___	No ✓	**Is the Sampled Area within a Wetland?** Yes ___ No ✓
Hydric Soil Present?	Yes ___	No ✓	If yes, optional Wetland Site ID:
Wetland Hydrology Present?	Yes ___	No ✓	

Remarks: (Explain alternative procedures here or in a separate report.)
This sample plot was taken in an upland and is associated with wetland sample plot WTL-267-DP1W.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No ✓	Depth (inches): ___
Water Table Present?	Yes ___	No ✓	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No ✓	Depth (inches): ___

Wetland Hydrology Present? Yes ___ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
None.

VEGETATION – Use scientific names of plants.

Sampling Point: WTL-267-DP1U

Tree Stratum (Plot size: 30' radius)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0	=Total Cover	
Sapling/Shrub Stratum (Plot size: 15' radius)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0	=Total Cover	
Herb Stratum (Plot size: 5' radius)			
1. Lotus corniculatus	25	Y	FACU
2. Calamagrostis canadensis	20	Y	OBL
3. Hieracium caespitosum	15	Y	
4. Daucus carota	15	Y	UPL
5. Fragaria virginiana	10	N	FACU
6. Rumex crispus	5	N	FAC
7. Centaurea stoebe	5	N	UPL
8.			
9.			
10.			
11.			
12.			
	95.0	=Total Cover	
Woody Vine Stratum (Plot size: 30' radius)			
1.			
2.			
3.			
4.			
	0	=Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 25.00 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	20	x 1 =	20
FACW species	0	x 2 =	0
FAC species	5	x 3 =	15
FACU species	35	x 4 =	140
UPL species	20	x 5 =	100
Column Totals:	80 (A)		275.00 (B)

Prevalence Index = B/A = 3.44

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ___ No ✓

Remarks: (Include photo numbers here or on a separate sheet.)

5 percent bare ground cover.

SOIL

Sampling Point WTL-267-DP1U

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-7	5YR 4/3	100					CL	Dry

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Iron Monosulfide (A18)
- ___ Mesic Spodic (A17) **(MLRA 144A, 145, 149B)**
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ High Chroma Sands (S11) (**LRR K, L**)
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) (**LRR K, L**)
- ___ Red Parent Material (F21) **(MLRA 145)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**) Thin
- ___ Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Red Parent Material (F21) **(outside MLRA 145)**
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ___ **No** ✓

Remarks:

Restrictive layer at 7 inches below the soil surface.



WTL-267-DP1U
2025-08-18
Lat/Long: 46.764074, -89.564837
Direction: N



WTL-267-DP1U
2025-08-18
Lat/Long: 46.764126, -89.566931
Direction: S

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Northcentral and Northeast Region
See ERDC/EL TR-12-1; the proponent agency is CECW-COR

OMB Control #: 0710-0024, Exp: 09/30/2027
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: White Pine | City/County: Ontonagon County | Sampling Date: 2025-08-18
Applicant/Owner: White Pine North | State: Michigan | Sampling Point: WTL-267-DP1W
Investigator(s): Gage Kriese | Section, Township, Range: sec 04 T050N R042W
Landform (hillside, terrace, etc.): Depression | Local relief (concave, convex, none): Concave | Slope %: 0-2
Subregion (LRR or MLRA): LRR K, MLRA 92 | Lat: 46.764089 | Long: -89.564769 | Datum: WGS84
Soil Map Unit Name: Dumps and Pits, mine | NWI classification: None
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ___ (If no, explain in Remarks.)
Are Vegetation ✓, Soil ✓, or Hydrology ✓ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ___
Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No ___	**Is the Sampled Area within a Wetland?** Yes ✓ No ___
Hydric Soil Present?	Yes ✓	No ___	If yes, optional Wetland Site ID: WTL-267
Wetland Hydrology Present?	Yes ✓	No ___	

Remarks: (Explain alternative procedures here or in a separate report.)
This sample plot was taken near flag one in wetland 267.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ✓ Surface Water (A1)
- ✓ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ✓ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ✓ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ✓ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ✓ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ✓	No ___	Depth (inches): 0.5
Water Table Present?	Yes ✓	No ___	Depth (inches): 0
Saturation Present? (includes capillary fringe)	Yes ✓	No ___	Depth (inches): 0

Wetland Hydrology Present? Yes ✓ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
None.

VEGETATION – Use scientific names of plants.

Sampling Point: WTL-267-DP1W

Tree Stratum (Plot size: 30' radius)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0	=Total Cover	
Sapling/Shrub Stratum (Plot size: 15' radius)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0	=Total Cover	
Herb Stratum (Plot size: 5' radius)			
1. Salix petiolaris	25	Y	FACW
2. Calamagrostis stricta	10	Y	FACW
3. Carex scoparia	10	Y	FACW
4. Equisetum hyemale	10	Y	FAC
5. Scirpus cyperinus	10	Y	OBL
6. Eleocharis obtusa	5	N	OBL
7. Eupatorium perfoliatum	5	N	FACW
8. Typha angustifolia	5	N	OBL
9.			
10.			
11.			
12.			
	80.0	=Total Cover	
Woody Vine Stratum (Plot size: 30' radius)			
1.			
2.			
3.			
4.			
	0	=Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.00 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	20	x 1 =	20
FACW species	50	x 2 =	100
FAC species	10	x 3 =	30
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	80 (A)		150.00 (B)

Prevalence Index = B/A = 1.88

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

✓ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ✓ **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)

20 percent bare ground cover.

SOIL

Sampling Point WTL-267-DP1W

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-1	7.5YR 2.5/1	100					CL	Saturated
1-5	5YR 4/3	95	5YR 4/2	5	D	M	C	Saturated

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Iron Monosulfide (A18)
- ___ Mesic Spodic (A17) **(MLRA 144A, 145, 149B)**
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ High Chroma Sands (S11) (**LRR K, L)**
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) (**LRR K, L**)
- ___ Red Parent Material (F21) **(MLRA 145)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**) Thin
- ___ Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Red Parent Material (F21) **(outside MLRA 145)**
- ___ Very Shallow Dark Surface (F22)
- ✓ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ✓ **No** ___

Remarks:

Restrictive layer at 5 inches below the soil surface. Obvious wetland situation.


WTL-267-DP1W
2025-08-18
Lat/Long: 46.762048, -89.564358
Direction: N


WTL-267-DP1W
2025-08-18
Lat/Long: 46.764111, -89.564730
Direction: S

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Northcentral and Northeast Region
See ERDC/EL TR-12-1; the proponent agency is CECW-COR

OMB Control #: 0710-0024, Exp: 09/30/2027
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: White Pine | City/County: Ontonagon County | Sampling Date: 2025-08-18

Applicant/Owner: White Pine North | State: Michigan | Sampling Point: WTL277-DP1U

Investigator(s): Gage Kriese | Section, Township, Range: sec 04 T050N R042W

Landform (hillside, terrace, etc.): Shoulder | Local relief (concave, convex, none): Convex | Slope %: 0-2

Subregion (LRR or MLRA): LRR K, MLRA 92 | Lat: 46.763340 | Long: -89.561249 | Datum: WGS84

Soil Map Unit Name: Big Iron-Flintsteel-Gull Point, frequently flooded, complex, dissected, 1 to 15 percent slopes | NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No ____	**Is the Sampled Area within a Wetland?** Yes ____ No ✓
Hydric Soil Present?	Yes ____	No ✓	If yes, optional Wetland Site ID: ____
Wetland Hydrology Present?	Yes ____	No ✓	

Remarks: (Explain alternative procedures here or in a separate report.)
This sample plot was taken in an upland and is associated with wetland 277.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No ✓	Depth (inches): ____
Water Table Present?	Yes ____	No ✓	Depth (inches): ____
Saturation Present? (includes capillary fringe)	Yes ____	No ✓	Depth (inches): ____

Wetland Hydrology Present? Yes ____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
None.

VEGETATION – Use scientific names of plants.

Sampling Point: WTL-277-DP1U

Tree Stratum (Plot size: 30' radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. Betula alleghaniensis	60	Y	FAC
2. Tsuga canadensis	30	Y	FACU
3.			
4.			
5.			
6.			
7.			
	90.0	=Total Cover	

Sapling/Shrub Stratum (Plot size: 15' radius)			
1. Fraxinus pennsylvanica	15	Y	FACW
2. Acer rubrum	10	Y	FAC
3.			
4.			
5.			
6.			
7.			
	25.0	=Total Cover	

Herb Stratum (Plot size: 5' radius)			
1. Tilia americana	10	Y	FACU
2. Acer rubrum	5	Y	FAC
3. Fraxinus pennsylvanica	5	Y	FACW
4. Populus tremuloides	5	Y	FAC
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	25.0	=Total Cover	

Woody Vine Stratum (Plot size: 30' radius)			
1.			
2.			
3.			
4.			
	0	=Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 6 (A)

Total Number of Dominant Species Across All Strata: 8 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 75.00 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	20	x 2 =	40
FAC species	80	x 3 =	240
FACU species	40	x 4 =	160
UPL species	0	x 5 =	0
Column Totals:	140 (A)		440.00 (B)

Prevalence Index = B/A = 3.14

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ✓ **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)

75 percent bare ground cover.

SOIL

Sampling Point WTL-277-DP1U

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-2	7.5YR 2.5/1	100					SL	Dry
2-14	5YR 5/3	100					SIL	Dry

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Iron Monosulfide (A18)
- ___ Mesic Spodic (A17) **(MLRA 144A, 145, 149B)**
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ High Chroma Sands (S11) (**LRR K, L)**
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) (**LRR K, L**)
- ___ Red Parent Material (F21) **(MLRA 145)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**) Thin
- ___ Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Red Parent Material (F21) **(outside MLRA 145)**
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ___ **No** ✓

Remarks:

None.


WTL-277-DP1U
2025-08-18
Lat/Long: 46.780789, -89.546495
Direction: SE


WTL-277-DP1U
2025-08-18
Lat/Long: 46.780789, -89.546495
Direction: NW

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Northcentral and Northeast Region
See ERDC/EL TR-12-1; the proponent agency is CECW-COR

OMB Control #: 0710-0024, Exp: 09/30/2027
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: White Pine | City/County: Ontonagon County | Sampling Date: 2025-08-18

Applicant/Owner: White Pine North | State: Michigan | Sampling Point: WTL277-DP1W

Investigator(s): Gage Kriese | Section, Township, Range: sec 04 T050N R042W

Landform (hillside, terrace, etc.): Depression | Local relief (concave, convex, none): Concave | Slope %: 0-2

Subregion (LRR or MLRA): LRR K, MLRA 92 | Lat: 46.763260 | Long: -89.561326 | Datum: WGS84

Soil Map Unit Name: Big Iron-Flintsteel-Gull Point, frequently flooded, complex, dissected, 1 to 15 percent slopes | NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No ___	**Is the Sampled Area within a Wetland?** Yes ✓ No ___
Hydric Soil Present?	Yes ✓	No ___	If yes, optional Wetland Site ID: WTL-277
Wetland Hydrology Present?	Yes ✓	No ___	

Remarks: (Explain alternative procedures here or in a separate report.)
This sample plot was taken in wetland 277 and is associated with upland sample plot WTL-277-DP1U.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ✓ Surface Water (A1)
- ✓ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ✓ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ✓ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ✓ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ✓	No ___	Depth (inches): 0
Water Table Present?	Yes ✓	No ___	Depth (inches): 0
Saturation Present? (includes capillary fringe)	Yes ✓	No ___	Depth (inches): 0

Wetland Hydrology Present? Yes ✓ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
None.

VEGETATION – Use scientific names of plants.

Sampling Point: WTL-277-DP1W

Tree Stratum (Plot size: 30' radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. Acer rubrum	15	Y	FAC
2.			
3.			
4.			
5.			
6.			
7.			
	15.0	=Total Cover	
Sapling/Shrub Stratum (Plot size: 15' radius)			
1. Salix petiolaris	20	Y	FACW
2. Betula papyrifera	15	Y	FACU
3. Salix discolor	15	Y	FACW
4. Populus tremuloides	10	N	FAC
5.			
6.			
7.			
	60.0	=Total Cover	
Herb Stratum (Plot size: 5' radius)			
1. Carex granularis	50	Y	FACW
2. Scirpus cyperinus	25	Y	OBL
3. Calamagrostis canadensis	15	N	OBL
4. Bidens cernua	5	N	OBL
5. Typha angustifolia	5	N	OBL
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100.0	=Total Cover	
Woody Vine Stratum (Plot size: 30' radius)			
1.			
2.			
3.			
4.			
	0	=Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 83.33 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	50	x 1 =	50
FACW species	85	x 2 =	170
FAC species	25	x 3 =	75
FACU species	15	x 4 =	60
UPL species	0	x 5 =	0
Column Totals:	175 (A)		355.00 (B)

Prevalence Index = B/A = 2.03

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

✓ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ✓ No ___

Remarks: (Include photo numbers here or on a separate sheet.)
None.

SOIL

Sampling Point WTL-277-DP1W

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-14	N 2.5/0	100					MMI	Saturated

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Iron Monosulfide (A18)
- ___ Mesic Spodic (A17) **(MLRA 144A, 145, 149B)**
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ High Chroma Sands (S11) (**LRR K, L)**
- ✓ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) (**LRR K, L**)
- ___ Red Parent Material (F21) **(MLRA 145)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**) Thin
- ___ Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Red Parent Material (F21) **(outside MLRA 145)**
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ✓ **No** ___

Remarks:

None.

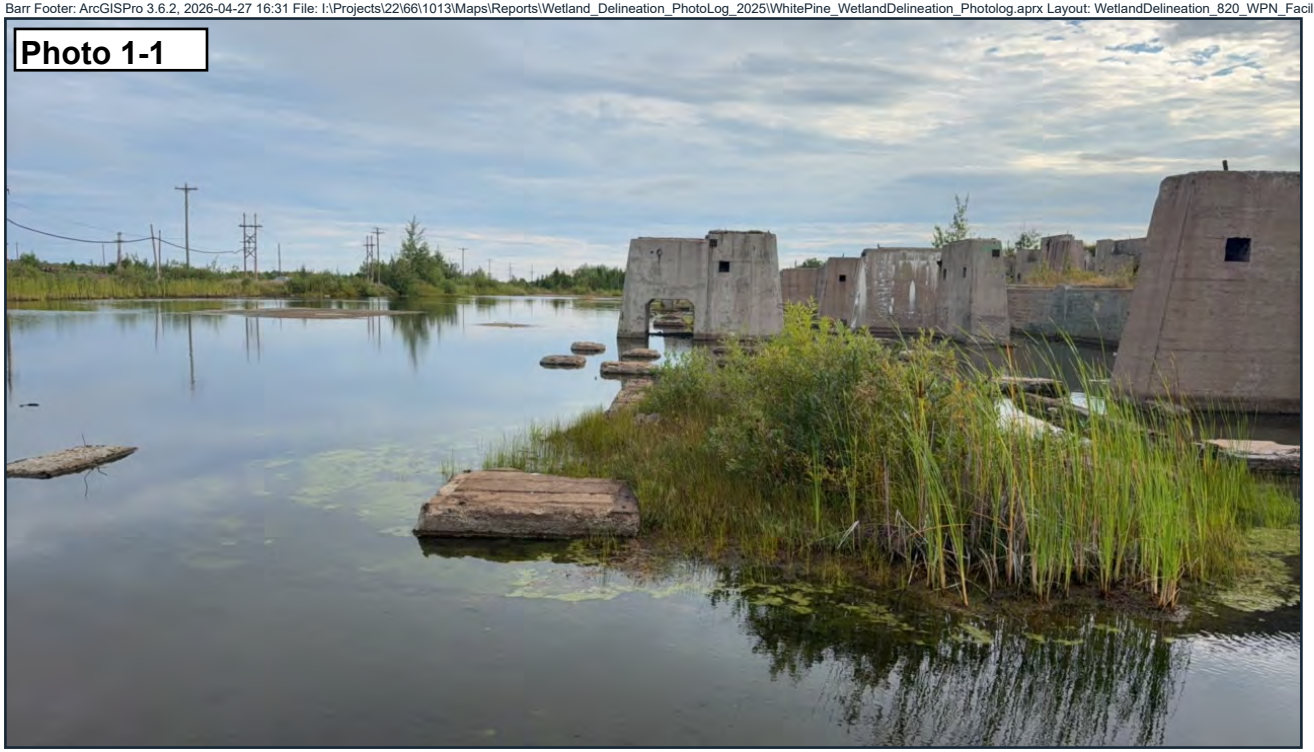

WTL-277-DP1W
2025-08-18
Lat/Long: 46.763299, -89.561297
Direction: NW


WTL-277-DP1W
2025-08-18
Lat/Long: 46.763261, -89.561352
Direction: SE

Appendix C

Wetland Delineation Photolog

Photo 1-1



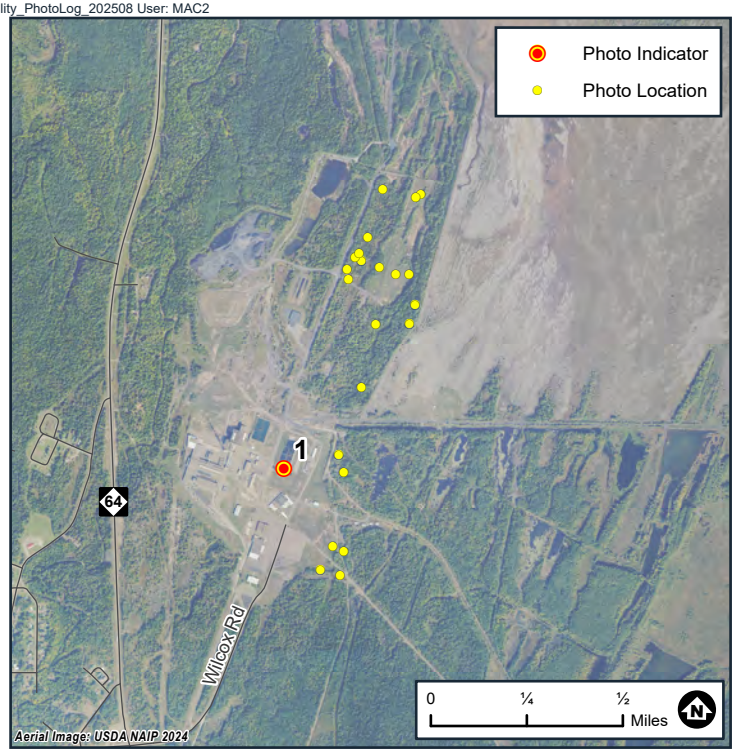


Photo 1-2





Page 1 of 23

820 WPN Facility
Wetland Delineation
Photo Locations
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, MI

BARR

Date: 8/18/2025

Photo 1 Caption:
WTL267

Photo 2 Caption:
UPL267

Note: Photo locations are approximate

Photo 2-1



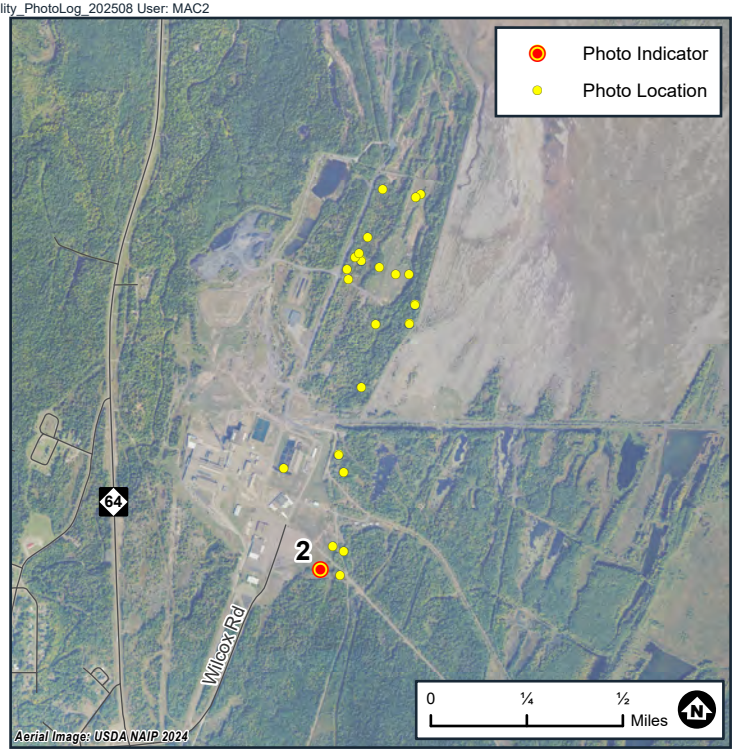
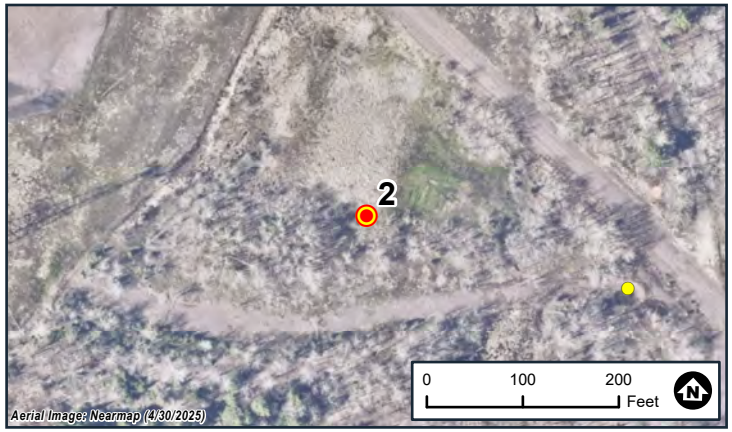


Photo 2-2





820 WPN Facility
Wetland Delineation
Photo Locations
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, MI

BARR

Date: 8/18/2025

Photo 1 Caption:
WTL 269 W

Photo 2 Caption:
WTL 269 U

Note: Photo locations are approximate

Photo 3-1



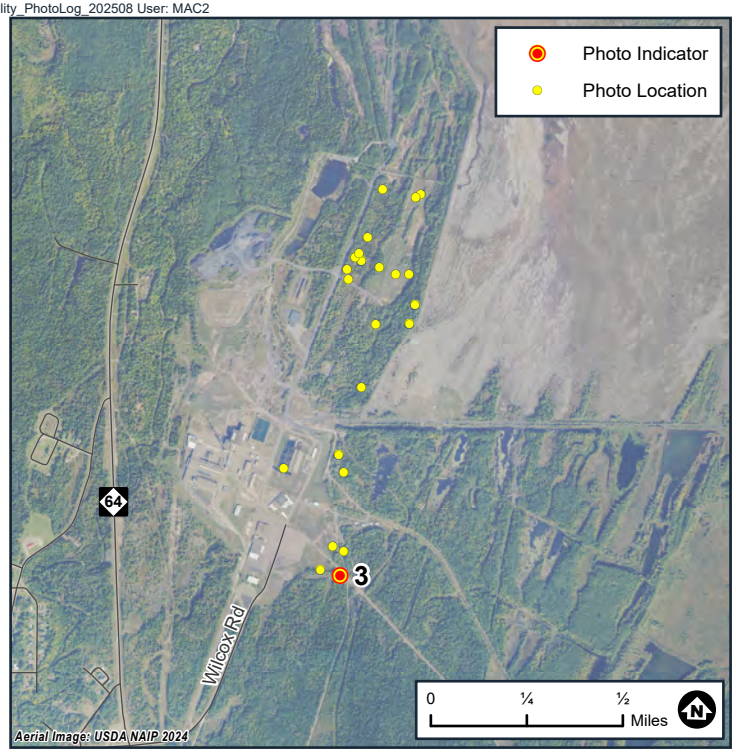
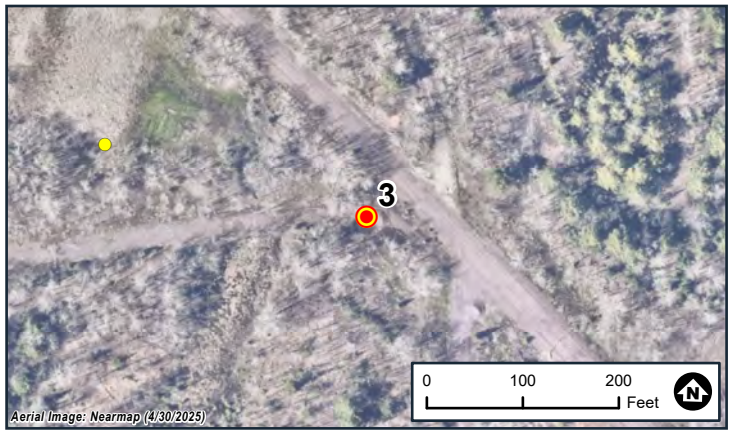


Photo 3-2





Page 3 of 23

820 WPN Facility
Wetland Delineation
Photo Locations
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, MI

BARR

Date: 8/18/2025

Photo 1 Caption:
WTL 271 W

Photo 2 Caption:
WTL 271 U

Note: Photo locations are approximate

Photo 4-1



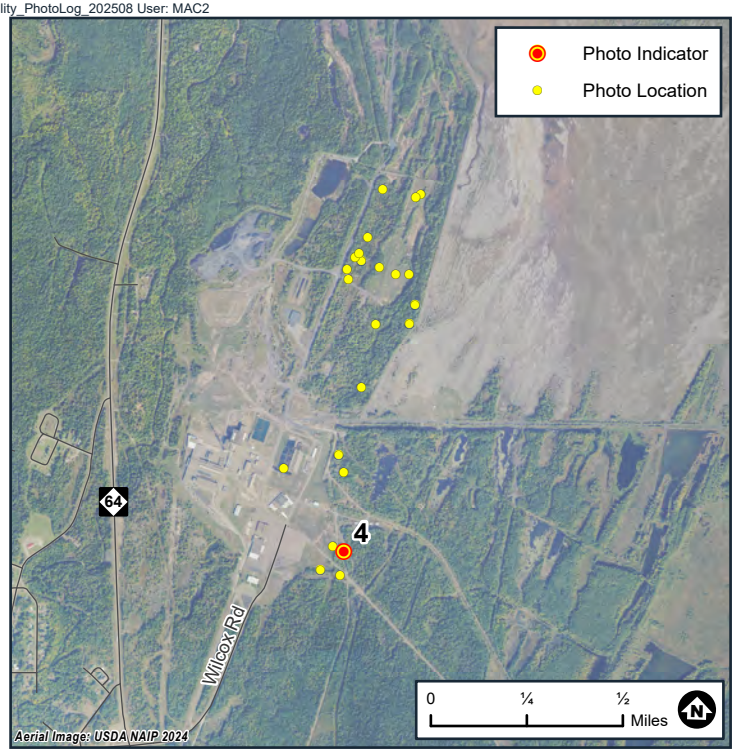
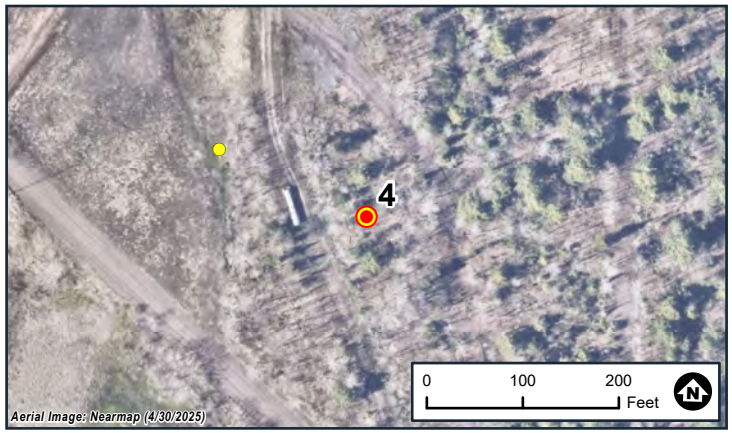


Photo 4-2





820 WPN Facility
Wetland Delineation
Photo Locations
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, MI

BARR

Date: 8/18/2025

Photo 1 Caption:
WTL 273 W

Photo 2 Caption:
WTL 273 U

Note: Photo locations are approximate

Photo 5-1



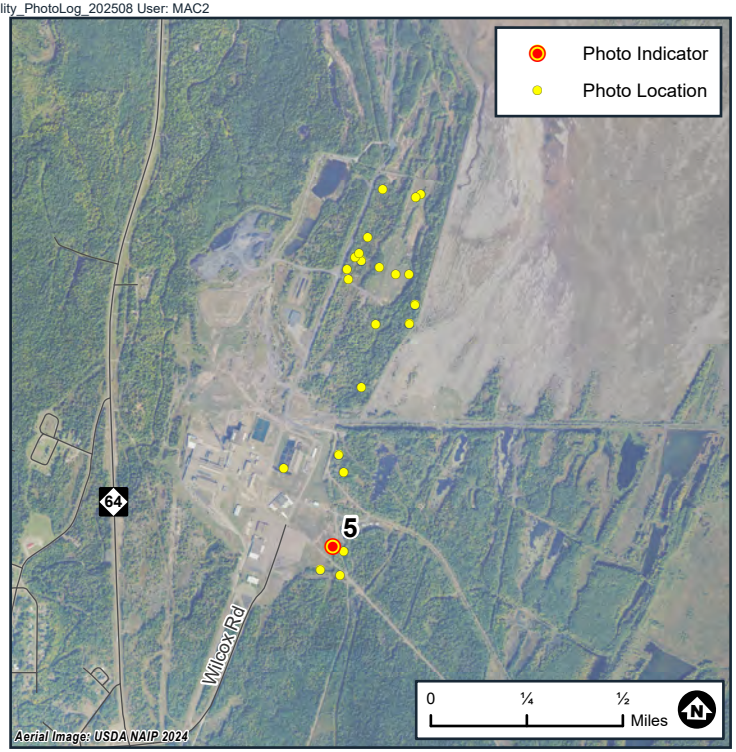
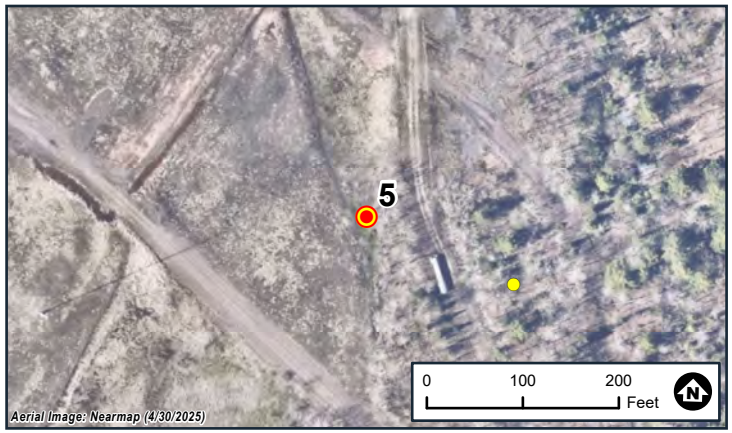


Photo 5-2





Page 5 of 23
820 WPN Facility
Wetland Delineation
Photo Locations
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, MI

BARR

Date: 8/18/2025

Photo 1 Caption:
WTL 275 W

Photo 2 Caption:
WTL 275 U

Note: Photo locations are approximate

Photo 6-1



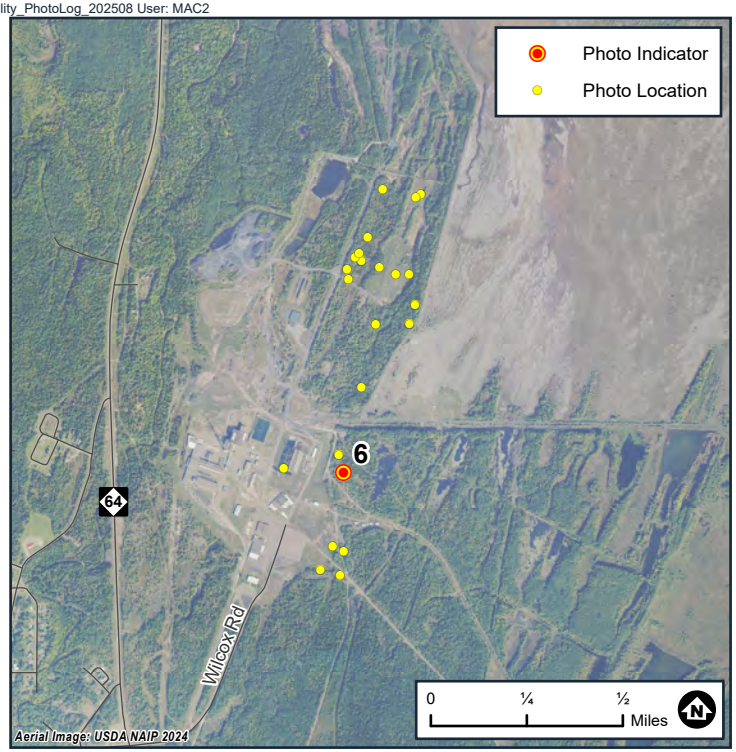
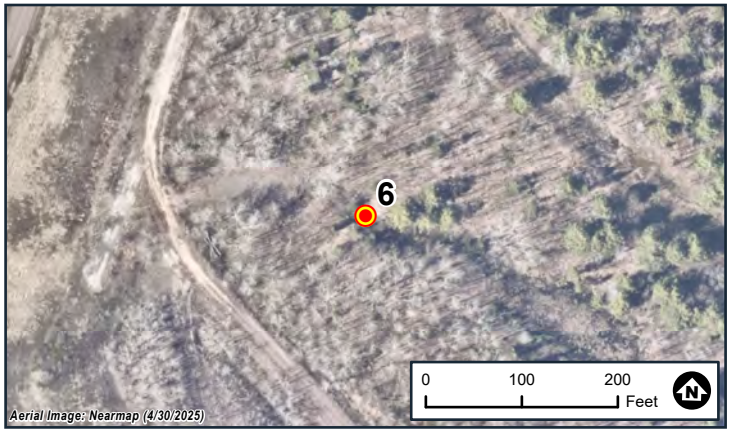


Photo 6-2





Page 6 of 23
820 WPN Facility
Wetland Delineation
Photo Locations
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, MI

BARR

Date: 8/18/2025

Photo 1 Caption:
WTL 277 W

Photo 2 Caption:
WTL 277 U

Note: Photo locations are approximate

Barr Footer: ArcGISPro 3.6.2, 2026-04-27 16:31 File: I:\Projects\22\66\1013\Maps\Reports\Wetland_Delineation_PhotoLog_2025\WhitePine_WetlandDelineation_Photolog.aprx Layout: WetlandDelineation_820_WPN_Facility_PhotoLog_202508 User: MAC2

Photo 7-1



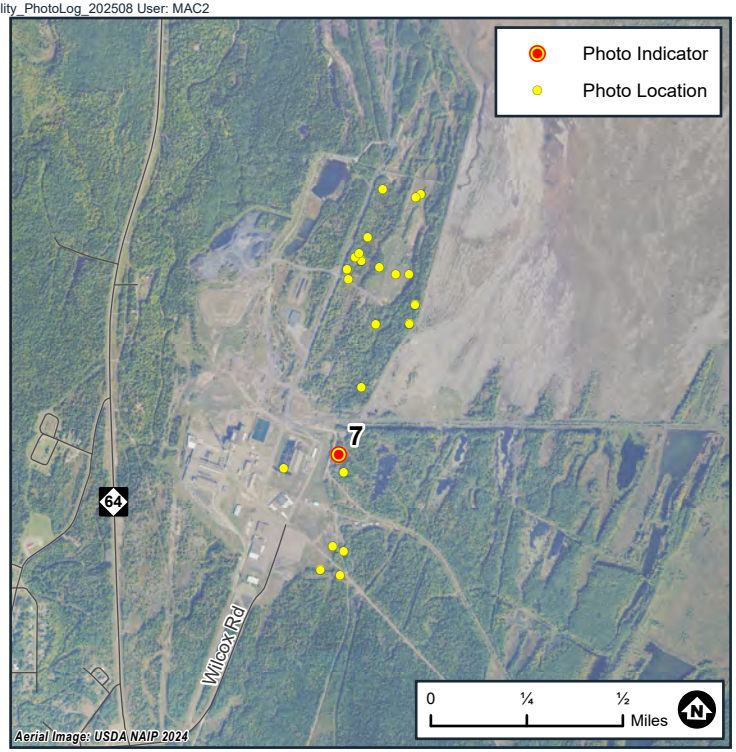
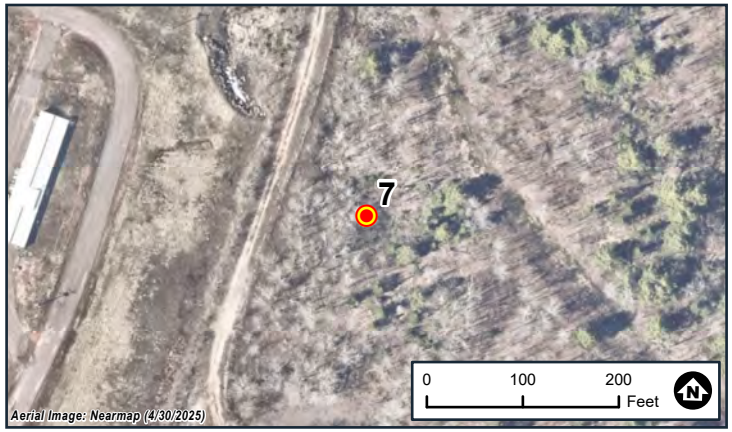


Photo 7-2





Page 7 of 23

820 WPN Facility
Wetland Delineation
Photo Locations
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, MI

BARR

Date: 8/18/2025

Photo 1 Caption:
WTL 281 W

Photo 2 Caption:
WTL 281 U

Note: Photo locations are approximate

Photo 8-1



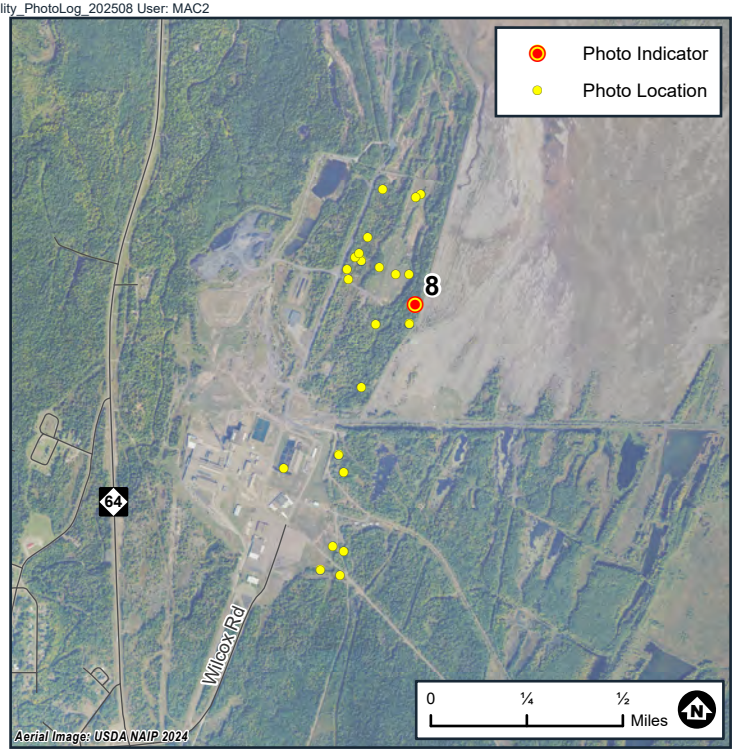
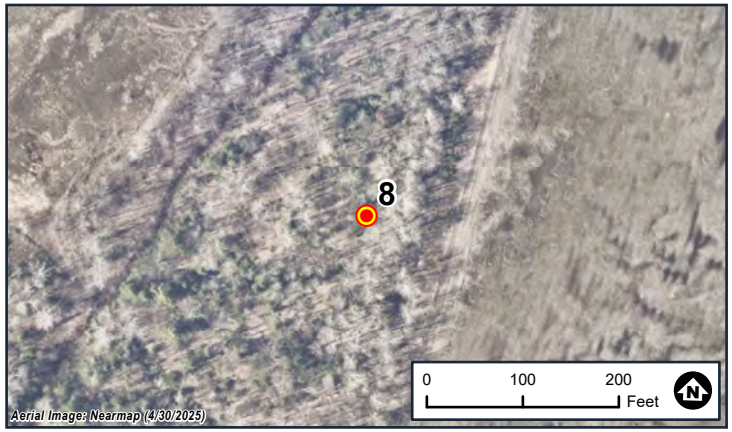


Photo 8-2





Page 8 of 23
820 WPN Facility
Wetland Delineation
Photo Locations
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, MI

BARR

Date: 8/18/2025

Photo 1 Caption:
WTL 285 W

Photo 2 Caption:
WTL 285 U

Note: Photo locations are approximate

Photo 9-1



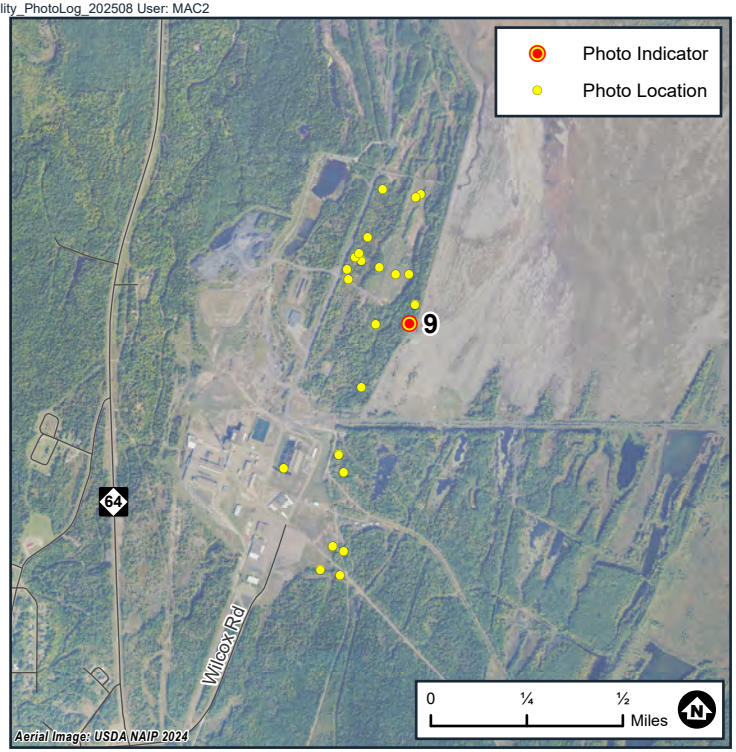
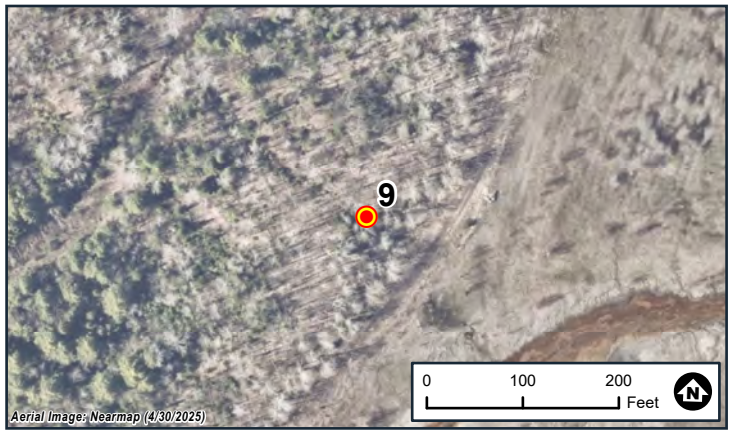


Photo 9-2





Page 9 of 23

820 WPN Facility
Wetland Delineation
Photo Locations
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, MI

BARR

Date: 8/18/2025

Photo 1 Caption:
WTL 287 W

Photo 2 Caption:
WTL 287 U

Note: Photo locations are approximate

Barr Footer: ArcGISPro 3.6.2, 2026-04-27 16:31 File: I:\Projects\22\66\1013\Maps\Reports\Wetland_Delineation_PhotoLog_2025\WhitePine_WetlandDelineation_Photolog.aprx Layout: WetlandDelineation_820_WPN_Facility_PhotoLog_202508 User: MAC2

Photo 10-1



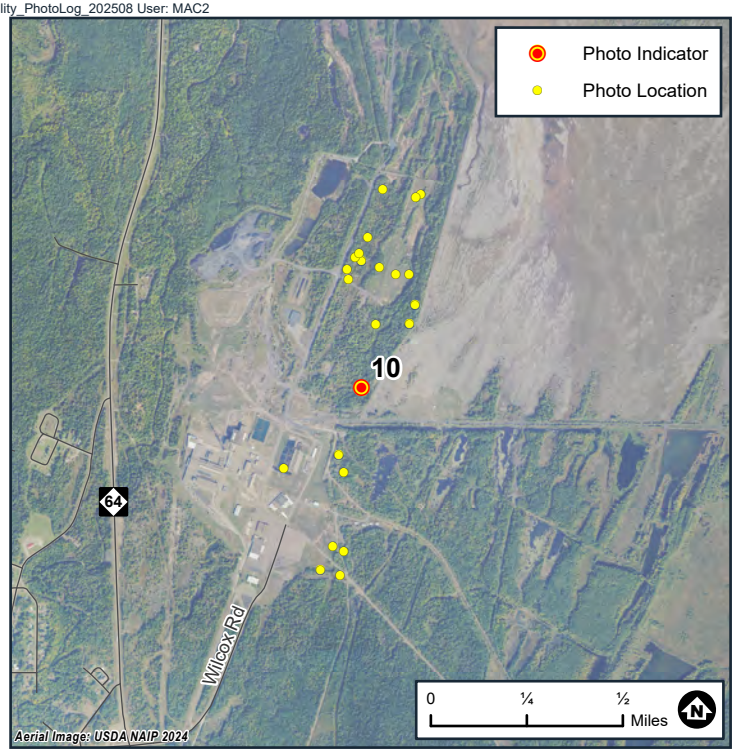
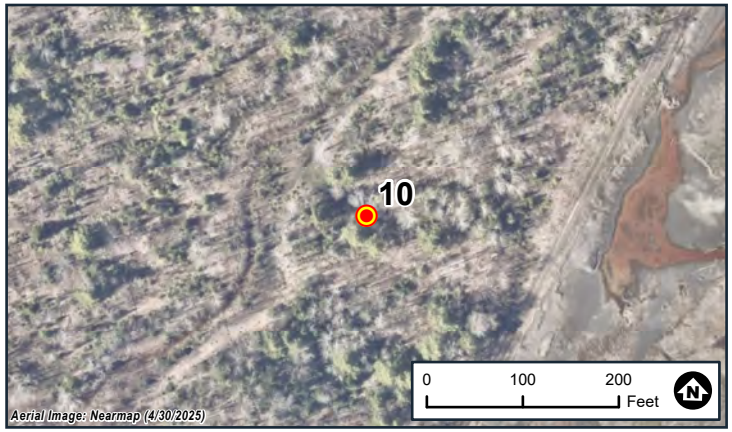


Photo 10-2





820 WPN Facility
Wetland Delineation
Photo Locations
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, MI

BARR

Date: 8/18/2025

Photo 1 Caption:
WTL 278 W

Photo 2 Caption:
WTL 278 U

Note: Photo locations are approximate

Barr Footer: ArcGISPro 3.6.2, 2026-04-27 16:31 File: I:\Projects\22\66\1013\Maps\Reports\Wetland_Delineation_PhotoLog_2025\WhitePine_WetlandDelineation_Photolog.aprx Layout: WetlandDelineation_820_WPN_Facility_PhotoLog_202508 User: MAC2

Photo 11-1



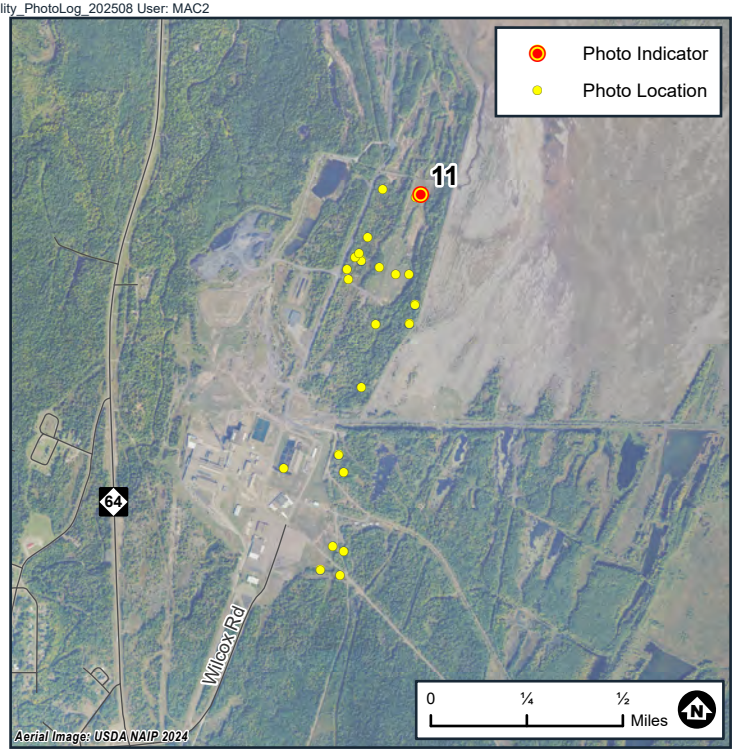
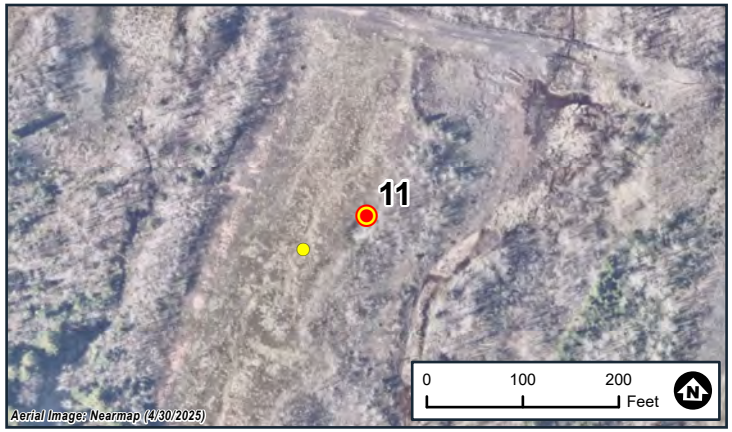


Photo 11-2





820 WPN Facility
Wetland Delineation
Photo Locations
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, MI

BARR

Date: 8/19/2025

Photo 1 Caption:
WTL 282 W

Photo 2 Caption:
WTL 282 U

Note: Photo locations are approximate

Barr Footer: ArcGISPro 3.6.2, 2026-04-27 16:31 File: I:\Projects\22\66\1013\Maps\Reports\Wetland_Delineation_PhotoLog_2025\WhitePine_WetlandDelineation_Photolog.aprx Layout: WetlandDelineation_820_WPN_Facility_PhotoLog_202508 User: MAC2

Photo 12-1



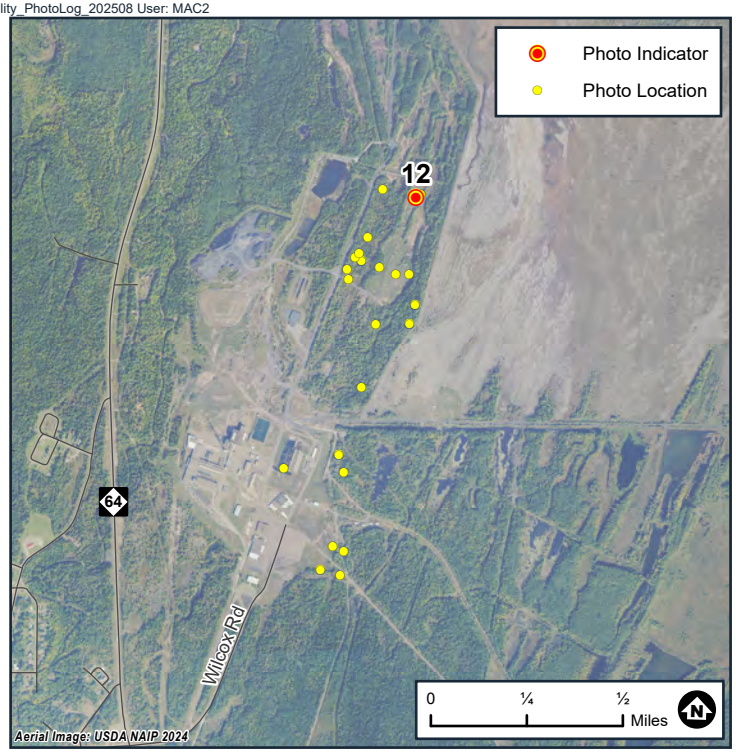
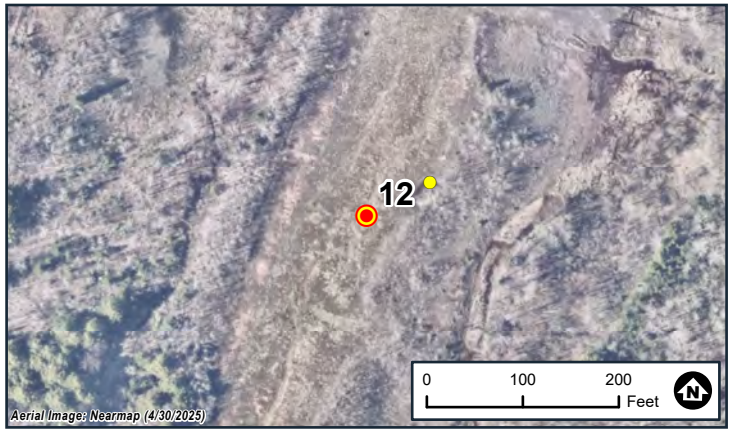


Photo 12-2





820 WPN Facility
Wetland Delineation
Photo Locations
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, MI

BARR

Date: 8/19/2025

Photo 1 Caption:
Upland linear feature

Photo 2 Caption:
Upland linear feature

Note: Photo locations are approximate

Photo 13-1



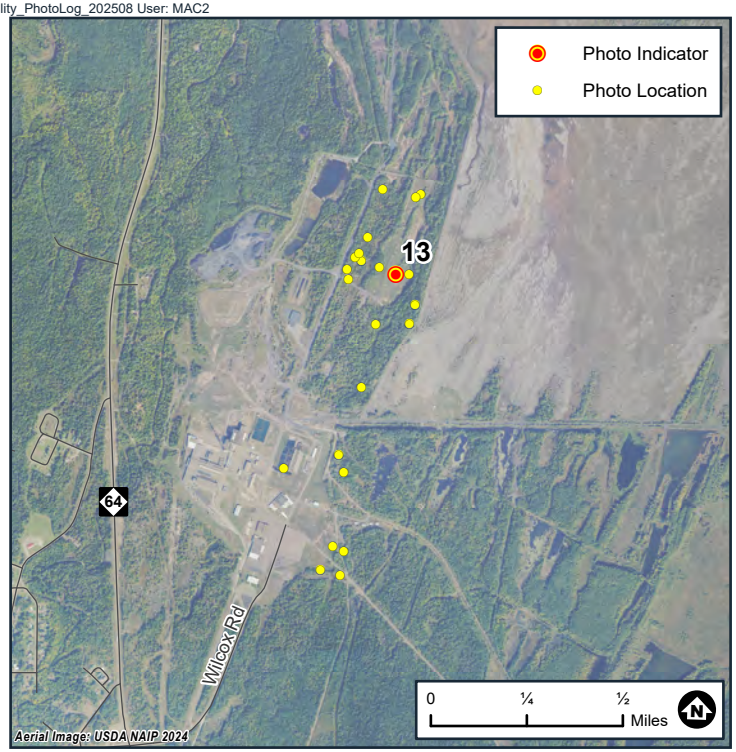
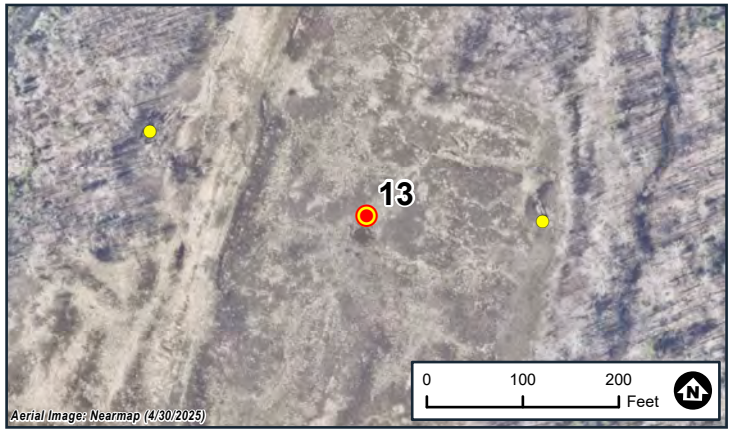


Photo 13-2





820 WPN Facility
Wetland Delineation
Photo Locations
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, MI

BARR

Date: 8/19/2025

Photo 1 Caption:
WTL 284 W

Photo 2 Caption:
WTL 284 U

Note: Photo locations are approximate

Photo 14-1



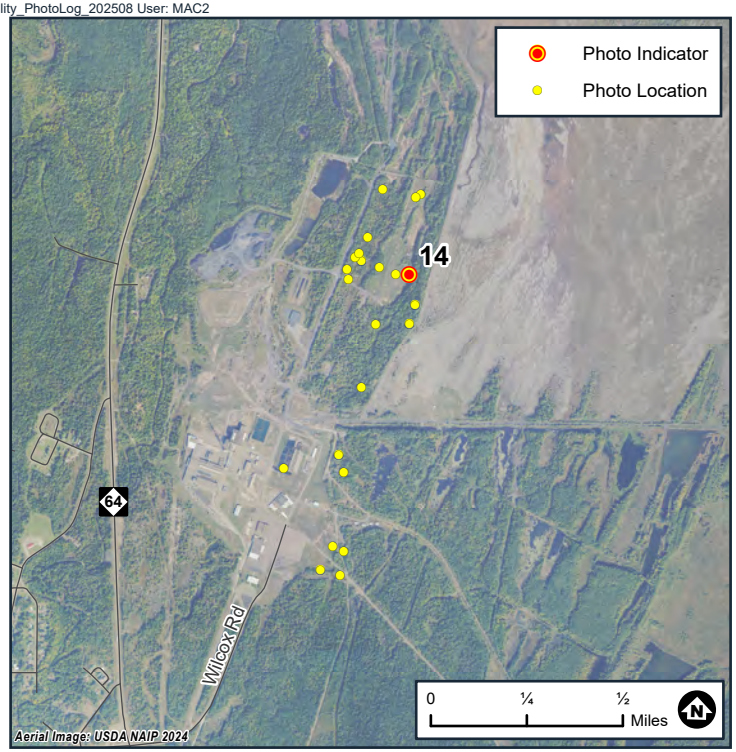
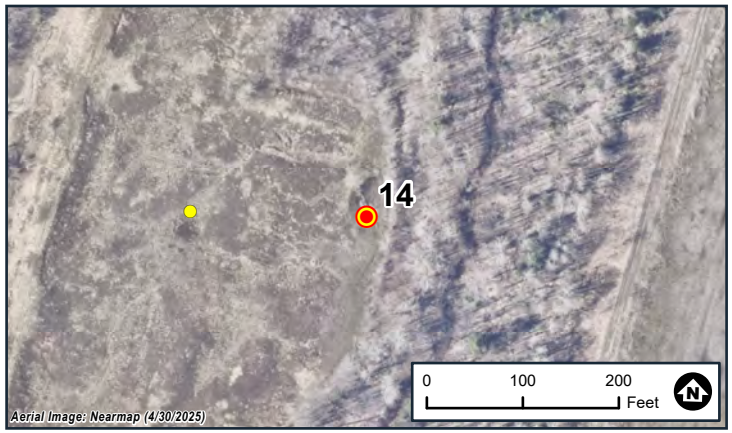


Photo 14-2





820 WPN Facility
Wetland Delineation
Photo Locations
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, MI

BARR

Date: 8/19/2025

Photo 1 Caption:
WTL 286 W

Photo 2 Caption:
WTL 286 U

Note: Photo locations are approximate

Photo 15-1



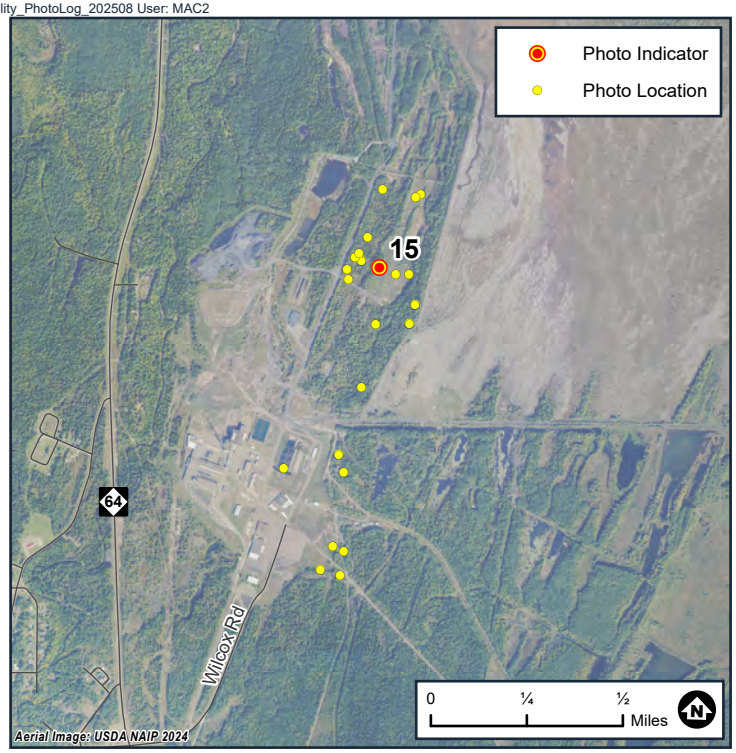
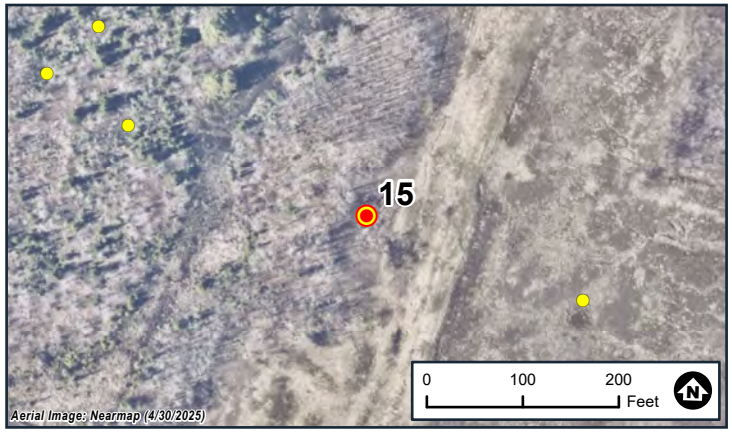


Photo 15-2





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820 WPN Facility
Wetland Delineation
Photo Locations
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, MI

BARR

Date: 8/19/2025

Photo 1 Caption:
WTL 288 W

Photo 2 Caption:
WTL 288 U

Note: Photo locations are approximate

Photo 16-1



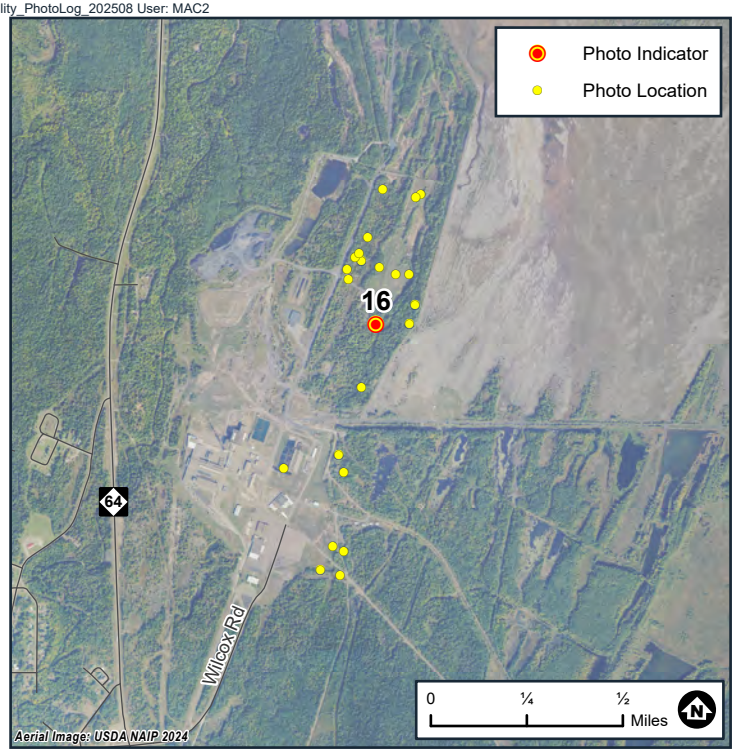
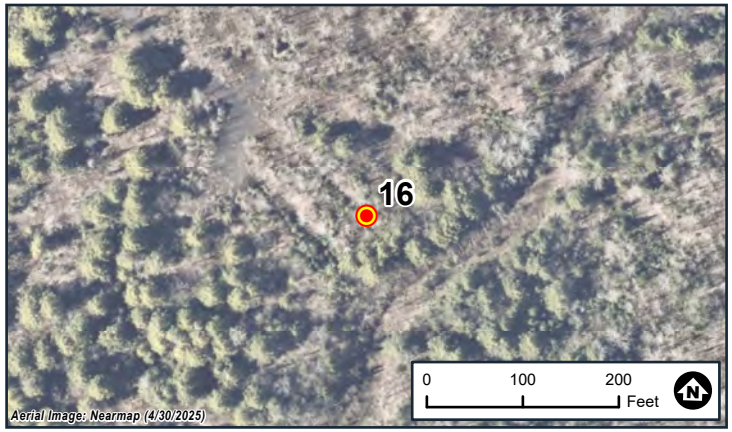


Photo 16-2





820 WPN Facility
Wetland Delineation
Photo Locations
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, MI

BARR

Date: 8/19/2025

Photo 1 Caption:
WTL 290 W

Photo 2 Caption:
WTL 290 U

Note: Photo locations are approximate

Barr Footer: ArcGISPro 3.6.2, 2026-04-27 16:31 File: I:\Projects\22\66\1013\Maps\Reports\Wetland_Delineation_PhotoLog_2025\WhitePine_WetlandDelineation_Photolog.aprx Layout: WetlandDelineation_820_WPN_Facility_PhotoLog_202508 User: MAC2

Photo 17-1



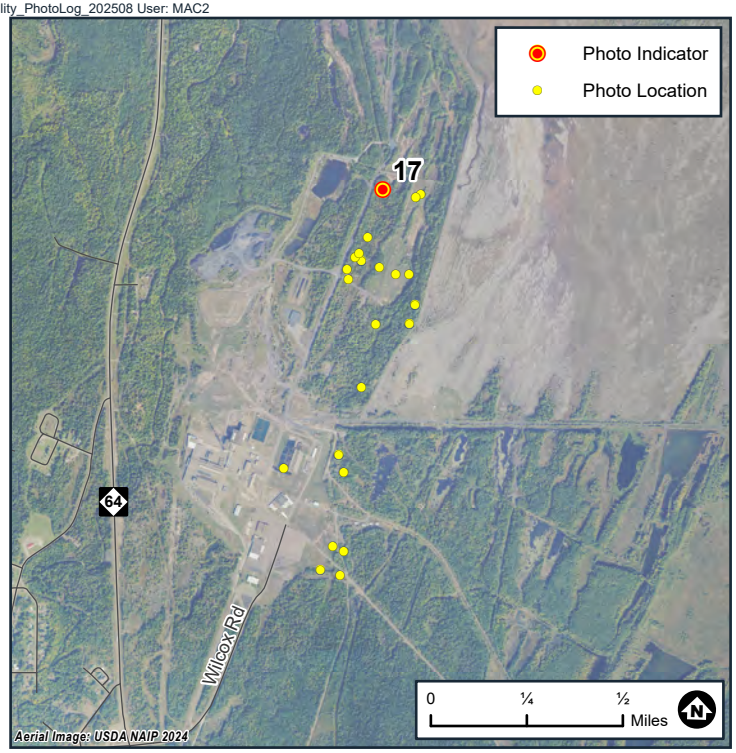
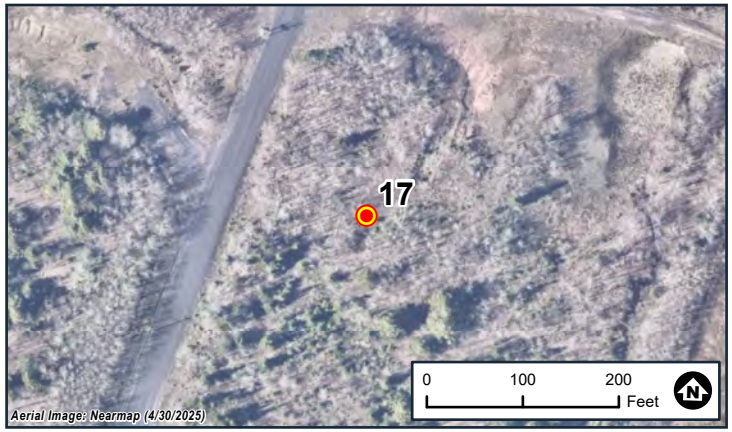


Photo 17-2





820 WPN Facility
Wetland Delineation
Photo Locations
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, MI

BARR

Date: 8/19/2025

Photo 1 Caption:
WTL 292 W

Photo 2 Caption:
WTL 292 U

Note: Photo locations are approximate

Photo 18-1



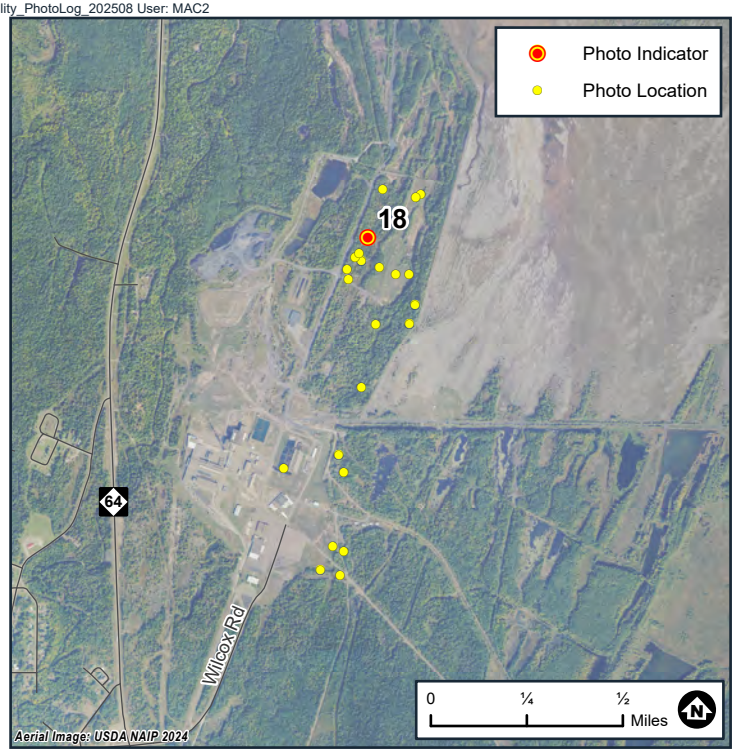
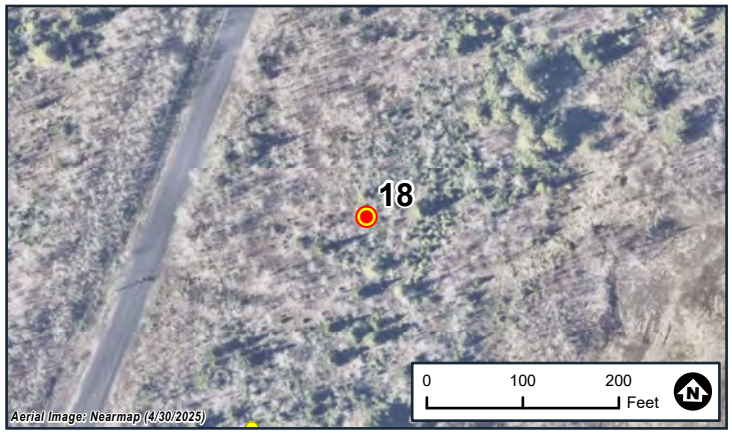


Photo 18-2





820 WPN Facility
Wetland Delineation
Photo Locations
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, MI

BARR

Date: 8/19/2025

Photo 1 Caption:
WTL 294 W

Photo 2 Caption:
WTL 294 U

Note: Photo locations are approximate

Barr Footer: ArcGISPro 3.6.2, 2026-04-27 16:31 File: I:\Projects\22\66\1013\Maps\Reports\Wetland_Delineation_PhotoLog_2025\WhitePine_WetlandDelineation_Photolog.aprx Layout: WetlandDelineation_820_WPN_Facility_PhotoLog_202508 User: MAC2

Photo 19-1



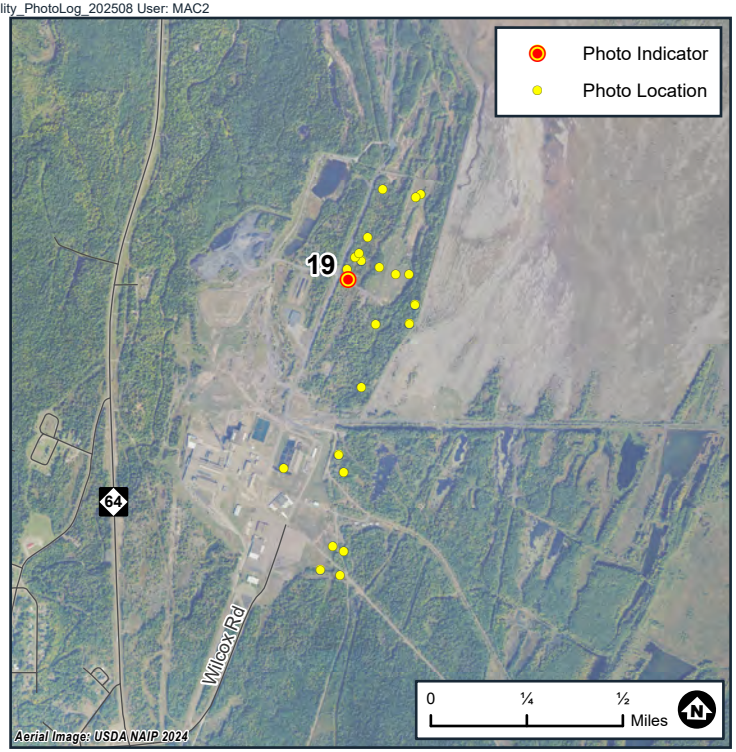
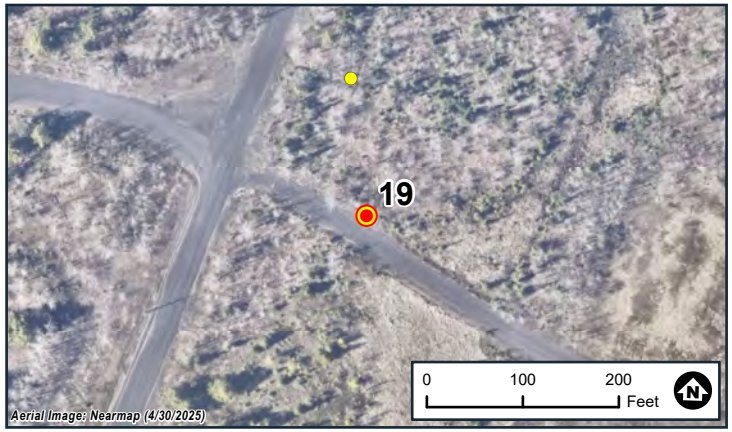


Photo 19-2





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820 WPN Facility
Wetland Delineation
Photo Locations
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, MI

BARR

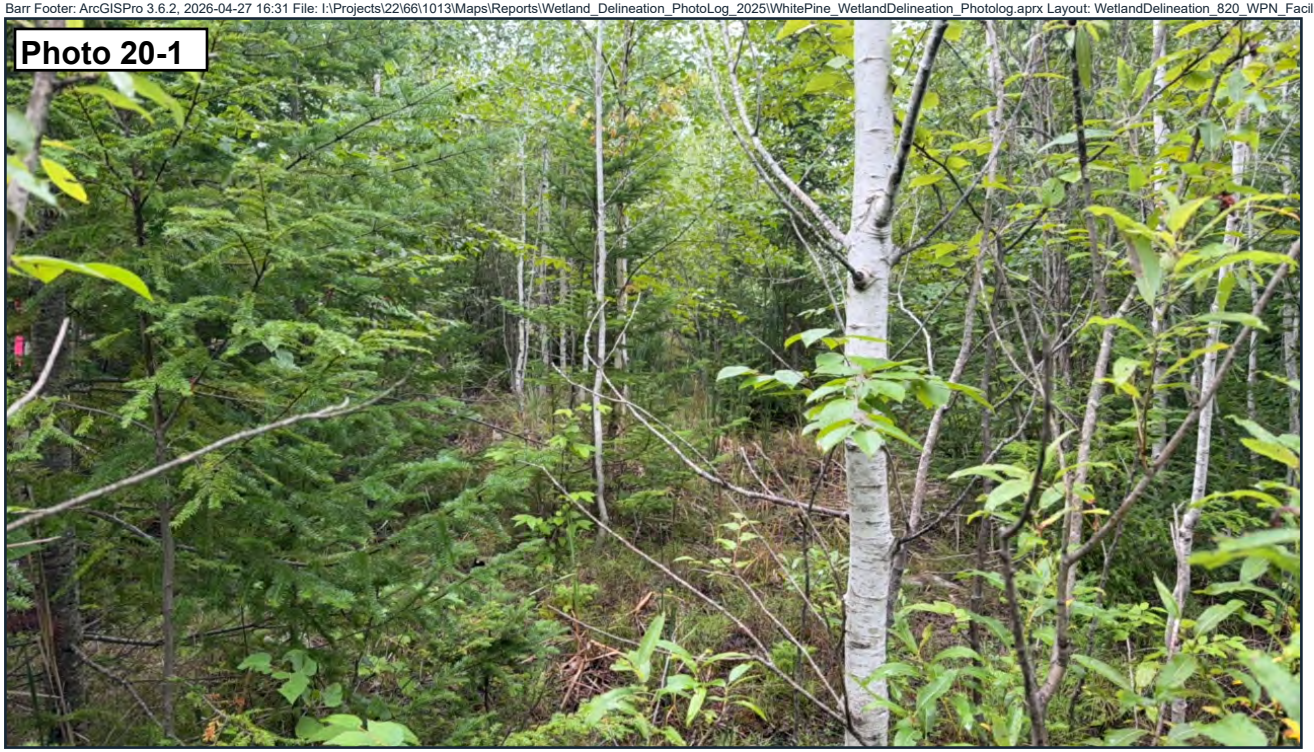
Date: 8/20/2025

Photo 1 Caption:
WTL 296 W

Photo 2 Caption:
WTL 296 U

Note: Photo locations are approximate

Photo 20-1



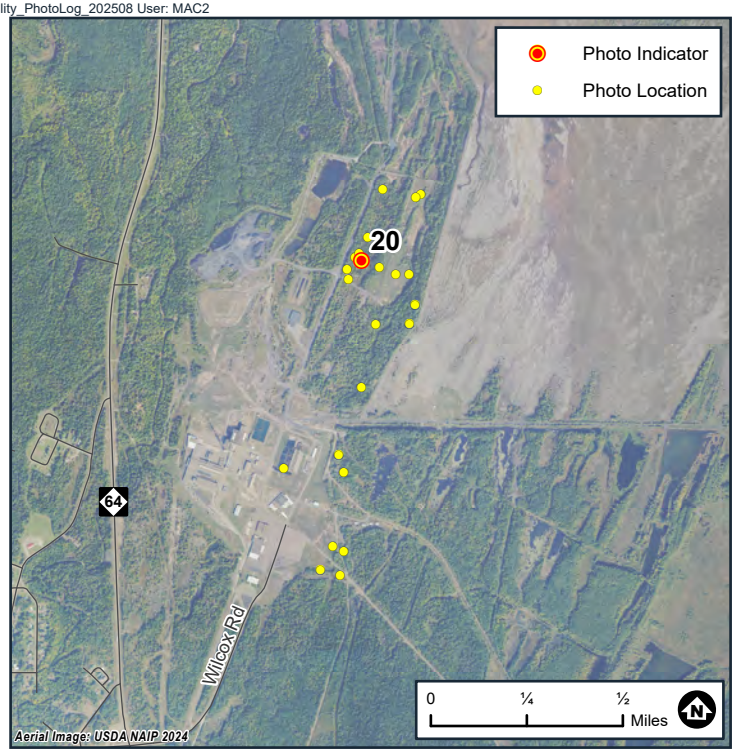
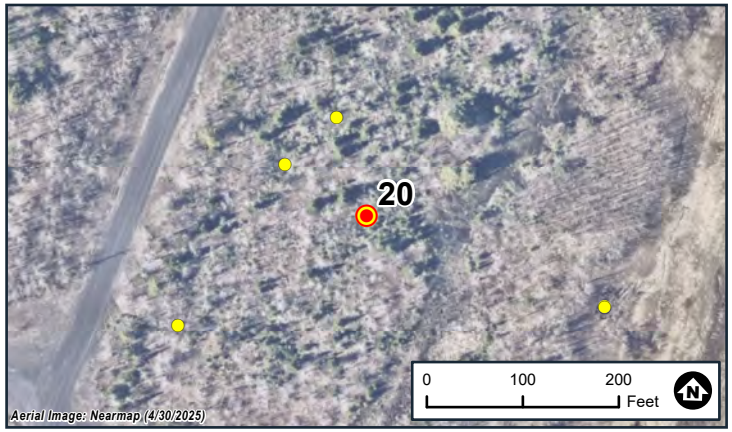


Photo 20-2





820 WPN Facility
Wetland Delineation
Photo Locations
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, MI

BARR

Date: 8/20/2025

Photo 1 Caption:
WTL 298 W

Photo 2 Caption:
WTL 298 U

Note: Photo locations are approximate

Photo 21-1



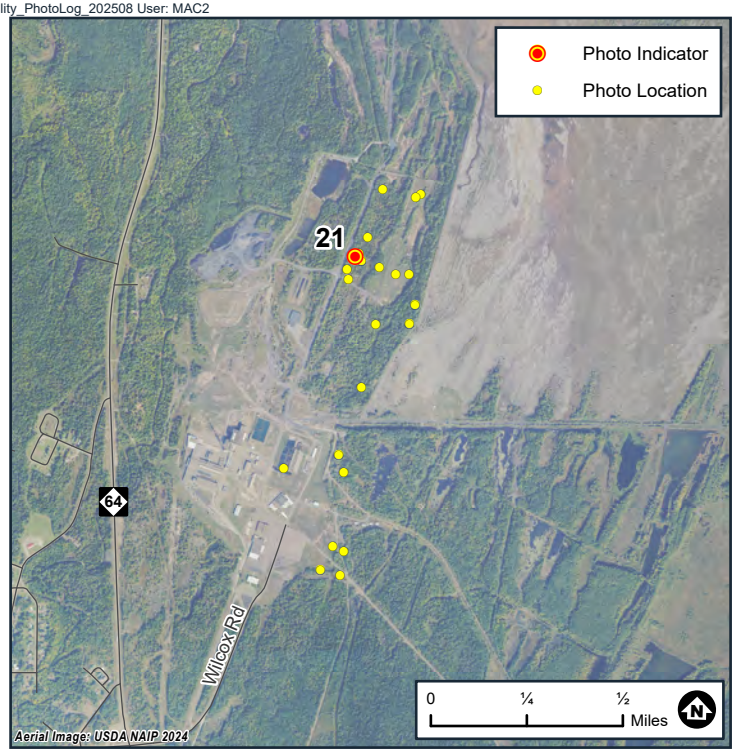
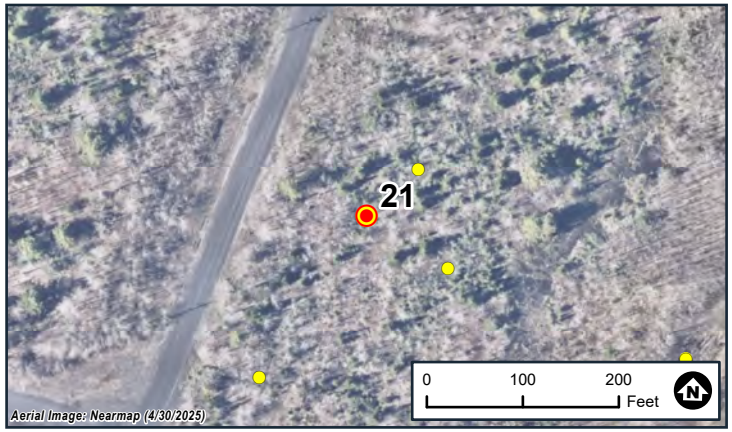


Photo 21-2





820 WPN Facility
Wetland Delineation
Photo Locations
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, MI

BARR

Date: 8/20/2025

Photo 1 Caption:
WTL 300 W

Photo 2 Caption:
WTL 300 U

Note: Photo locations are approximate

Barr Footer: ArcGISPro 3.6.2, 2026-04-27 16:31 File: I:\Projects\22\66\1013\Maps\Reports\Wetland_Delineation_PhotoLog_2025\WhitePine_WetlandDelineation_Photolog.aprx Layout: WetlandDelineation_820_WPN_Facility_PhotoLog_202508 User: MAC2

Photo 22-1



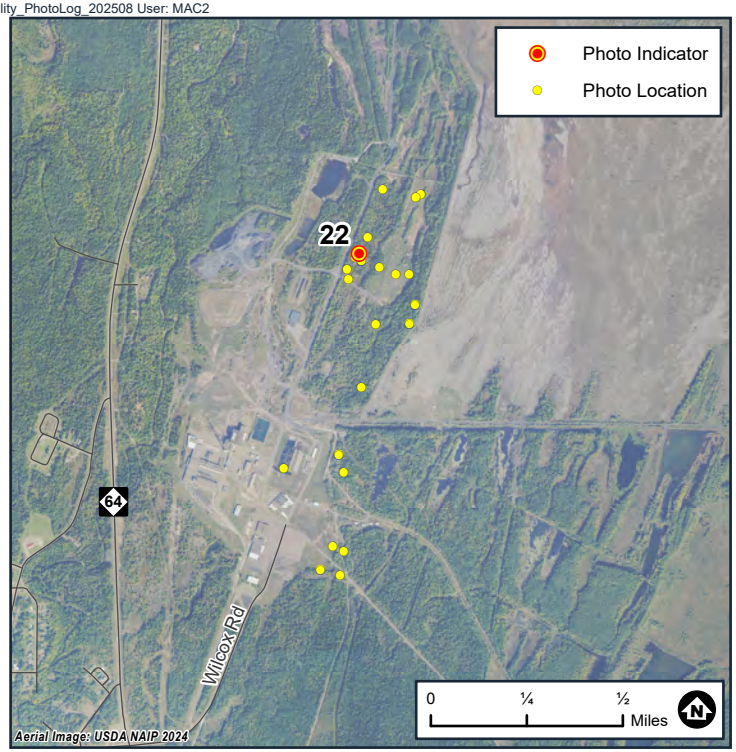
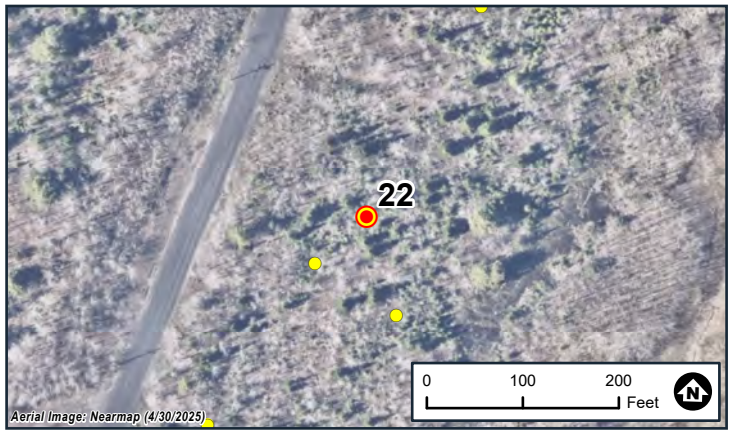


Photo 22-2





820 WPN Facility
Wetland Delineation
Photo Locations
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, MI

BARR

Date: 8/20/2025

Photo 1 Caption:
WTL 302 W

Photo 2 Caption:
WTL 302 U

Note: Photo locations are approximate

Photo 23-1



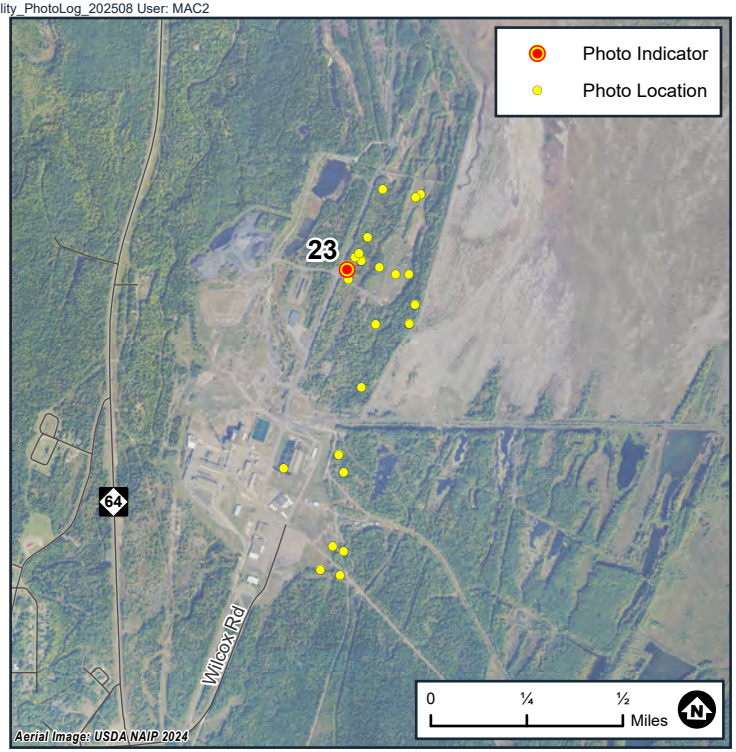
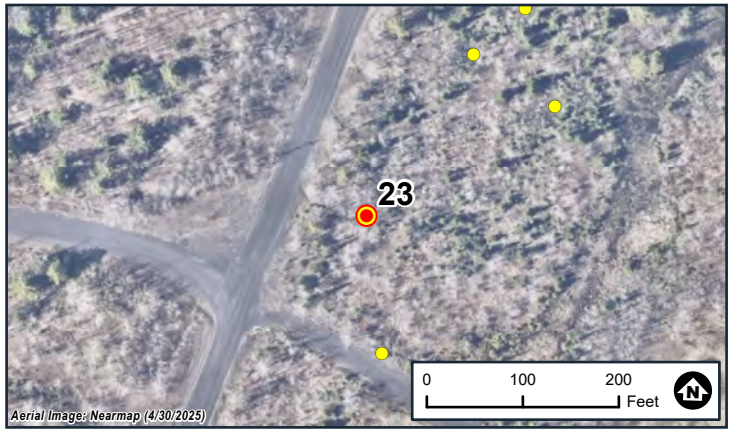


Photo 23-2





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820 WPN Facility
Wetland Delineation
Photo Locations
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, MI

BARR

Date: 8/20/2025

Photo 1 Caption:
WTL 304 W

Photo 2 Caption:
WTL 304 U

Note: Photo locations are approximate