

Elizabeth Mine Superfund Site 1898 Adit Closure & Sitewide Closure Activities

June 2021

This monthly update summarizes activities undertaken at the Elizabeth Mine Superfund Site (the “Site”) during June 2021. During this reporting period Nobis Group (Nobis) and Lockwood Remedial Technologies (LRT) completed primary and two subsequent dewatering events at the 1898 Adit. Water removed from the 1898 Adit was discharged into a 10,000-gallon frac tank where the pH was neutralized prior to discharging into the Underground Workings. Nobis and Maher Well Drilling (Maher) completed monitoring well decommissioning at the Site. Construction Drilling, Inc. (CDI) mobilized to the Site and successfully installed five boreholes into the 1898 Adit (i.e. BB-1, BB-2, BPG-1, PG-1, and PG-2).

Nobis performed daily monitoring of the Artesian Vent for field geochemistry and discharge and of the 1898 Adit potentiometric surface. Samples were collected from the 1898 Adit boreholes (i.e. AB-1 and AB-4) and Artesian Vent for laboratory analysis during dewatering events. Nobis also performed monthly performance monitoring of the Tailing Pile 1 (TP-1) Passive Treatment System (PTS). Major activities performed during this reporting period and activities anticipated in July 2021 are outlined below.

Major Activities Performed During June 2021:

- LRT dewatered, treated, and discharged ~214,000 gallons of water from the 1898 Adit into the Underground Workings.
- Maher decommissioned 19 monitoring wells.
- CDI mobilized drilling equipment to Site and successfully completed five boreholes.
- Nobis performed Sediment Toxicity Sampling at 4 locations in the Lord Brook Source Area.
- Nobis performed monthly PTS performance monitoring.

Major Activities Anticipated During July 2021:

- CDI to install/advance 17 additional boreholes into the 1898 Adit.
- LRT to mobilize the Phase II water treatment system prior to jet cleaning of the 1898 Adit.
- CDI to begin jet cleaning of the 1898 Adit.
- LRT to perform follow-up dewatering events at the 1898 Adit on an as-needed basis.
- LRT to operate the Phase II water treatment system during jet cleaning of the 1898 Adit.
- Nobis to perform monthly PTS performance monitoring.

MONTHLY UPDATE

• JUNE 1 – JUNE 30, 2021

EDITION 2



NOBIS	
DESCRIPTION OF WORK ACTIVITIES	
●	Performed Site and project management tasks.
●	Conducted field kick-off activities with subcontractors.
●	Conducted daily safety briefings.
●	Provided photo documentation of Site activities.
●	Conducted monthly performance monitoring for the TP-1 Passive Treatment System.
●	Collected geochemical field parameters, collected samples for laboratory analysis, and monitored discharge and background (i.e. non-pumping) potentiometric surfaces at the 1898 Adit boreholes and Artesian Vent during dewatering and background conditions.
●	Performed final round of groundwater sampling at new wells IC-16 & IC-17.
●	Performed sediment toxicity sampling at 4 locations in the Lord Brook Source Area (background/reference location, SM-01, SC-02, and SC-04).



Boulder encountered at borehole BB-2. This cobble-rich layer has been encountered intermittently between 11–13 feet below ground surface at boreholes installed between AB-1 and AB-4.

NOBIS / LRT	
DESCRIPTION OF WORK ACTIVITIES	
●	Completed primary dewatering on June 2 nd (totaling ~689,000 gallons), with pH adjustment and discharge into Underground Workings.
●	Performed two follow up (subsequent) dewatering events on June 11 th and 18 th (totaling ~90,300 gallons), with pH adjustment and discharge into the Underground Workings.
●	Performed daily analysis of 1898 Adit potentiometric surface and collected field geochemistry and discharge data from the Artesian Vent.



View of the dewatering pH adjustment system, frac tank, and high-head booster pump with North Open Cut visible in background; looking southwest.



Monitoring discharge and field geochemistry from the Artesian Vent during background conditions.



Discharge into the wet well during 1898 Adit dewatering activities.



View of the relocated wet well and generator for the 1898 Adit discharge system; looking south-southwest from the Mine Road / Coppersas Road intersection.

NOBIS / MAHER

DESCRIPTION OF WORK ACTIVITIES

- Maher mobilized to the Site on June 1st to commence monitoring well decommissioning activities.
- Maher completed decommissioning of 19 monitoring wells on-site, totaling over 3,300 feet.



View of monitoring well decommissioning west of the former South Open Cut Pit Lake; looking north.



View of monitoring well decommissioning northwest of the former South Open Cut Pit Lake; looking west.



Monitoring well decommissioning setup along Copperas Road for former IC-01; looking northeast.



Monitoring well decommissioning setup along Copperas Road for former IC-01; looking south.

NOBIS / CDI	
DESCRIPTION OF WORK ACTIVITIES	
●	CDI mobilized drilling equipment, casing, mixing tanks, pumps, and storage containers to the Site.
●	CDI set up / staged equipment, casing, and mixing tanks on Copperas Road south of the 1898 Adit drilling area.
●	CDI set up a water supply intake pump and 2-inch diameter poly water supply line from the water source pond east of TP-1 to the drilling location at the intersection of Copperas Road and Mine Road.
●	CDI installed/advanced five (5) large diameter boreholes (>11-3/8" diameter) that intercepted the 1898 Adit.



View of 2-inch poly conveyance line from water source pond; looking east along southern extent of TP-01.



View of mobilized jobsite trailers after being unloaded from trailer.



Offloading of Elletari MD 7000 drilling rig along Mine Road.



Checking plumbness during casing advancement of BPG-1; looking west-northwest from Mine Road / Copperas Road intersection.

WEATHER SUMMARY:

DATE	CONDITION	PRECIP. (Inches)	HIGH/LOW	WIND (mph)	WIND GUST (mph)	WIND DIRECTION
Tuesday, June 1, 2021	Fair	0.00	70°F/40°F	6	10	SW
Wednesday, June 2, 2021	Fair	0.00	78°F/40°F	3	4	WSW
Thursday, June 3, 2021	Fair	0.79	74°F/55°F	4.3	8	NW
Friday, June 4, 2021	Fair	0.19	78°F/58°F	2.7	4	S
Saturday, June 5, 2021	Sunny	0.01	85°F/52°F	5	6	SSW
Sunday, June 6, 2021	Sunny	0.01	88°F/61°F	3	5	SSW
Monday, June 7, 2021	Sunny	0.00	88°F/57°F	4	5	SSW
Tuesday, June 8, 2021	Overcast	0.19	85°F/63°F	3	3	SSW
Wednesday, June 9, 2021	Fair	0.00	82°F/54°F	5	7	SSW
Thursday, June 10, 2021	Sunny	0.00	74°F/46°F	3	5	SSW
Friday, June 11, 2021	Sunny	0.00	61°F/46°F	3	5	ENE
Saturday, June 12, 2021	Sunny	0.00	77°F/51°F	2	4	E
Sunday, June 13, 2021	Sunny	0.00	82°F/45°F	3	4	S
TWO-WEEK TOTAL		1.19				

Discharge line from 1898 Adit dewatering pH adjustment system to North Open Cut; looking west with Deep Adit Boreholes (AB-3 and AB-5) in foreground and North Open Cut in background.



WEATHER SUMMARY:

DATE	CONDITION	PRECIP. (Inches)	HIGH/LOW	WIND (mph)	WIND GUST (mph)	WIND DIRECTION
Monday, June 14, 2021	Overcast	0.28	62°F/49°F	3	6	E
Tuesday, June 15, 2021	Overcast	0.01	75°F/57°F	4	6	SSW
Wednesday, June 16, 2021	Partly Cloudy	0.00	66°F/44°F	5	10	SW
Thursday, June 17, 2021	Sunny	0.00	72°F/39°F	5	7	WSW
Friday, June 18, 2021	Sunny	0.01	80°F/40°F	2	4	WSW
Saturday, June 19, 2021	Partly Cloudy	0.10	82°F/59°F	5	7	SSW
Sunday, June 20, 2021	Partly Cloudy	0.00	82°F/52°F	4	5	S
Monday, June 21, 2021	Overcast	1.00	90°F/56°F	7	9	S
Tuesday, June 22, 2021	Overcast	0.13	68°F/53°F	2	5	SE
Wednesday, June 23, 2021	Partly Cloudy	0.00	68°F/42°F	3	5	S
Thursday, June 24, 2021	Partly Cloudy	0.00	78°F/40°F	5	6	WNW
Friday, June 25, 2021	Sunny	0.00	75°F/44°F	4	5	NW
Saturday, June 26, 2021	Sunny	0.00	76°F/61°F	5	8	NNW
Sunday, June 27, 2021	Sunny	0.00	86°F/63°F	3	6	S
Monday, June 28, 2021	Partly Cloudy	0.11	89°F/65°F	3	5	SSW
Tuesday, June 29, 2021	Overcast	0.42	89°F/65°F	4	5	S
Wednesday, June 30, 2021	Partly Cloudy	0.05	85°F/67°F	0	0	--
THREE-WEEK TOTAL		2.11				
JUNE MONTHLY TOTAL		3.30				

WEATHER SUMMARY:

- Weather caused a 15-minute delay / work stoppage on June 30, 2021 at end of day.



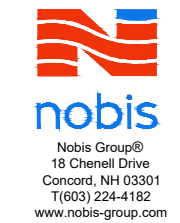
View of the drill rig setup along the west edge of Mine Road, ready to commence drilling at borehole PG-3.



View of the intake hose, double diaphragm pump, and 2-inch poly water line at the water source pond.



NOTES:
 1. GREEN BOREHOLES WITH GREEN TEXT ARE COMPLETE.



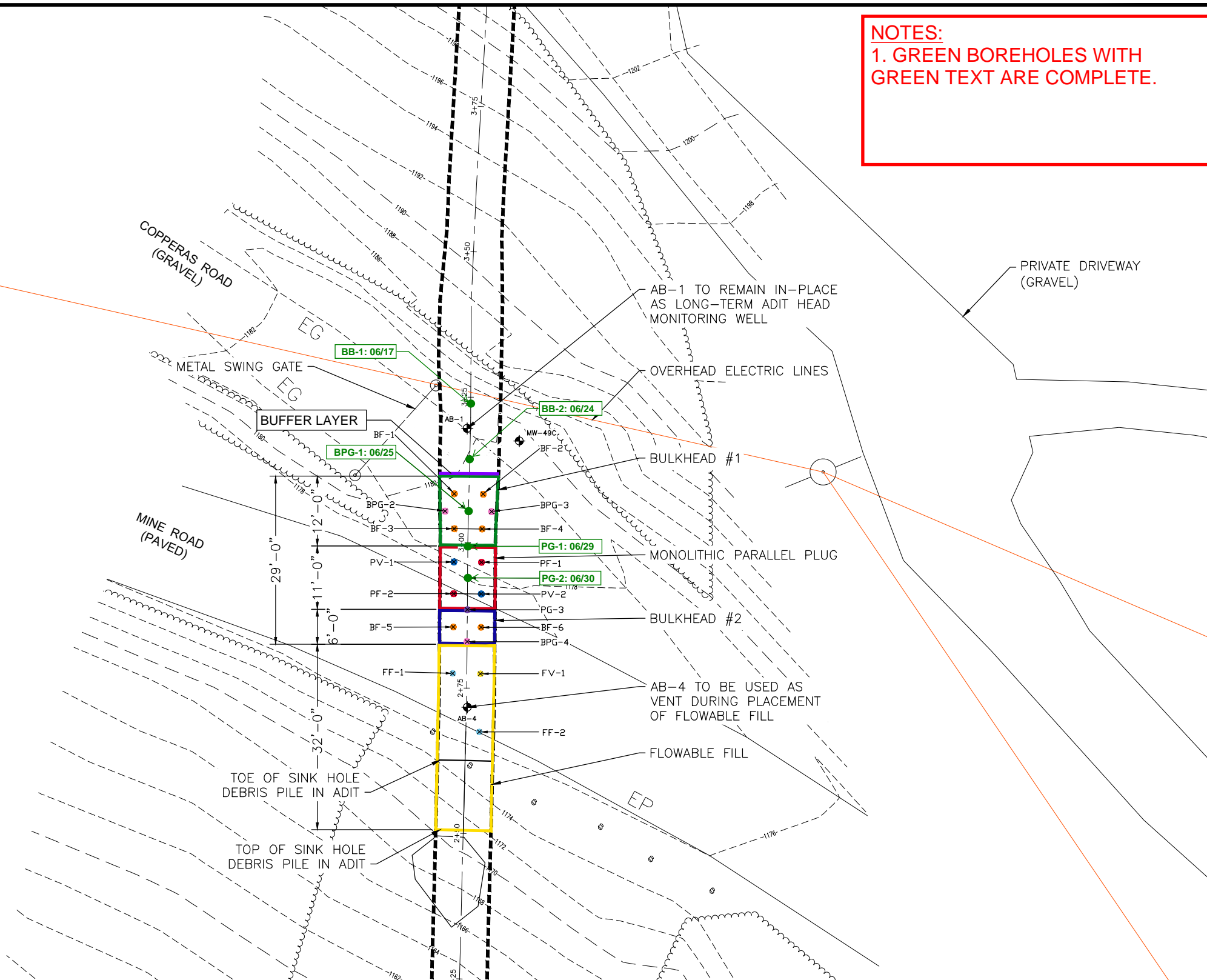
**NOBIS
 PROGRESS
 MARKUP AS OF
 JUNE 30, 2021**

ISSUED FOR
 CONSTRUCTION

ELIZABETH MINE
 SUPERFUND SITE

ADIT CLOSURE
 IMPLEMENTATION
 WORK PLAN

SOUTH STRAFFORD,
 VERMONT



NOTES:
 1. ADIT ALIGNMENT IS BASED ON THE HISTORICAL PROFILE PLAN, PREPARED FOR THE VERMONT COPPER CO. BY WALKER & GALLISON OF MONTPELIER AND BARRE, VERMONT, DATED OCTOBER 1907, AND SONAR DATA OBTAINED BY HAGER GEOSCIENCE INC. IN JUNE 2020.
 2. TOPOGRAPHY AND PHYSICAL FEATURES BASED ON FIELD SURVEY CONDUCTED BY DOUCET SURVEY ON JANUARY 8, 9 & 10 2020.

LEGEND:
 - - - - - 1200 MAJOR CONTOUR
 - - - - - 1202 MINOR CONTOUR
 ~~~~~ EXISTING TREELINE  
 - - - - - APPROXIMATE LOCATION OF 1898 ADIT EXTENTS  
 - - - - - PROFILE ALIGNMENT

- BUFFER BOREHOLE (BB-#)
- PLUG GROUT BOREHOLE (PG-#)
- PLUG FILL BOREHOLE (PF-#)
- PLUG VENT BOREHOLE (PV-#)
- BULKHEAD PRESSURE GROUT BOREHOLE (BPG-#)
- BULKHEAD FILL BOREHOLE (BF-#)
- FLOWABLE FILL FILL BOREHOLE (FF-#)
- FLOWABLE FILL VENT BOREHOLE (FV-#)
- EXISTING MONITORING WELL

| NO.       | DATE | DESCRIPTION |
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0 10' 20'  
 GRAPHIC SCALE

|                    |                                |
|--------------------|--------------------------------|
| DATE:              | APRIL 23, 2021                 |
| NOBIS PROJECT NO.: | 94506.00                       |
| DRAWN BY:          | NZ                             |
| CHECKED BY:        | CA                             |
| CAD DRAWING FILE:  | 94501-ADIT-CLOSURE-IMP-OPT.dwg |
| SHEET TITLE        |                                |

**1898 ADIT AND  
 BOREHOLE  
 LAYOUT**

**FIGURE  
 1**





ARTESIAN VENT  
SAMPLE DEPTH: 260'

SOUTH VENT  
SAMPLE DEPTH: 420'

RES-15

RES-18

RES-16

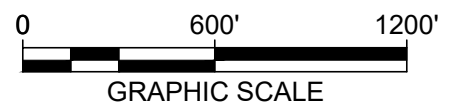
RES-01

**NOTES:**

- 1. SAMPLE DEPTHS ARE BELOW TOP OF CASING.

**LEGEND:**

● IC-11 MW SELECTED FOR IC ZONE RECLASSIFICATION GROUNDWATER MONITORING



IC-11  
SHALLOW SAMPLE DEPTH: 31'  
DEEP SAMPLE DEPTH: 64'

IC-12  
SHALLOW SAMPLE DEPTH: 27'  
DEEP SAMPLE DEPTH: 71'

IC-15  
SHALLOW SAMPLE DEPTH: 27'  
DEEP SAMPLE DEPTH: 77'

IC-03  
SHALLOW SAMPLE DEPTH: 17'  
DEEP SAMPLE DEPTH: 95'

IC-14  
SHALLOW SAMPLE: 33'  
DEEP SAMPLE: 70'

IC-13  
SHALLOW SAMPLE DEPTH: 32'  
NO DEEP SAMPLE

IC-16  
SHALLOW SAMPLE DEPTH: 28'  
DEEP SAMPLE DEPTH: 66'

IC-17  
SHALLOW: 41'  
DEEP: 59'



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**FIGURE 2**

**IC ZONE RECLASSIFICATION  
GROUNDWATER MONITORING LOCATIONS  
ELIZABETH MINE SUPERFUND SITE  
SOUTH STRAFFORD, VERMONT**

DRAWN BY: NJZ

CHECKED BY: JCA

PROJECT NO. 94507.00

DATE: DECEMBER 30, 2020





ISSUED FOR  
CONSTRUCTION

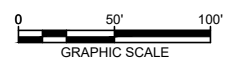
ELIZABETH MINE  
SUPERFUND SITE

ADIT CLOSURE  
IMPLEMENTATION  
WORK PLAN

SOUTH STRAFFORD,  
VERMONT

| NO. | DATE | DESCRIPTION |
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| DATE:             | APRIL 23, 2021             |
| NOBIS PROJECT NO. | 94506.00                   |
| DRAWN BY:         | NZ                         |
| CHECKED BY:       | CA                         |
| CAD DRAWING FILE: | 94501-ADIT-CLOSURE-IMP.dwg |

SHEET TITLE

GENERAL  
OVERVIEW OF  
DEWATERING  
SYSTEM SETUP

FIGURE  
**3**



**LEGEND:**

- ADIT BOREHOLE/  
MONITORING WELL
- DISCHARGE HOSE FROM  
ADIT TO WEIR TANK
- DISCHARGE HOSE FROM WEIR  
TANK TO TYSON MANWAY

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ARTESIAN VENT

SAMPLING, FIELD GEOCHEMISTRY MEASUREMENTS, AND FLOW MONITORING PRIOR TO STARTUP, DURING, AND FOLLOWING DEWATERING

MW-49C: GROUNDWATER ELEVATION MONITORING PRIOR TO STARTUP, DURING, AND FOLLOWING DEWATERING

AB-1: SAMPLING AND FIELD GEOCHEMISTRY MEASUREMENTS PRIOR TO STARTUP, DURING, AND FOLLOWING DEWATERING

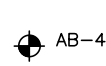
POST-TREATMENT: FIELD GEOCHEMISTRY AND FLOW MEASUREMENTS DURING DEWATERING

AB-2 & AB-5: GROUNDWATER ELEVATION MONITORING PRIOR TO STARTUP, DURING, AND FOLLOWING DEWATERING

VISUAL INSPECTION OF DEEP ADIT SHAFT AND TYSON MANWAY DURING AND FOLLOWING DEWATERING

AB-4

**LEGEND:**



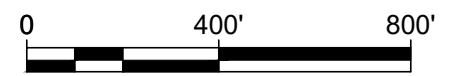
EXISTING MONITORING WELL / ADIT BOREHOLE



DISCHARGE HOSE FROM ADIT TO TREATMENT SYSTEM



DISCHARGE HOSE FROM ADIT TO TREATMENT SYSTEM



GRAPHIC SCALE

FIGURE 4

SAMPLING AND MONITORING LOCATIONS  
ADIT CLOSURE IMPLEMENTATION WORK PLAN  
ELIZABETH MINE SUPERFUND SITE  
SOUTH STRAFFORD, VERMONT

DRAWN BY: NJZ

CHECKED BY: JCA

PROJECT NO. 94506.00

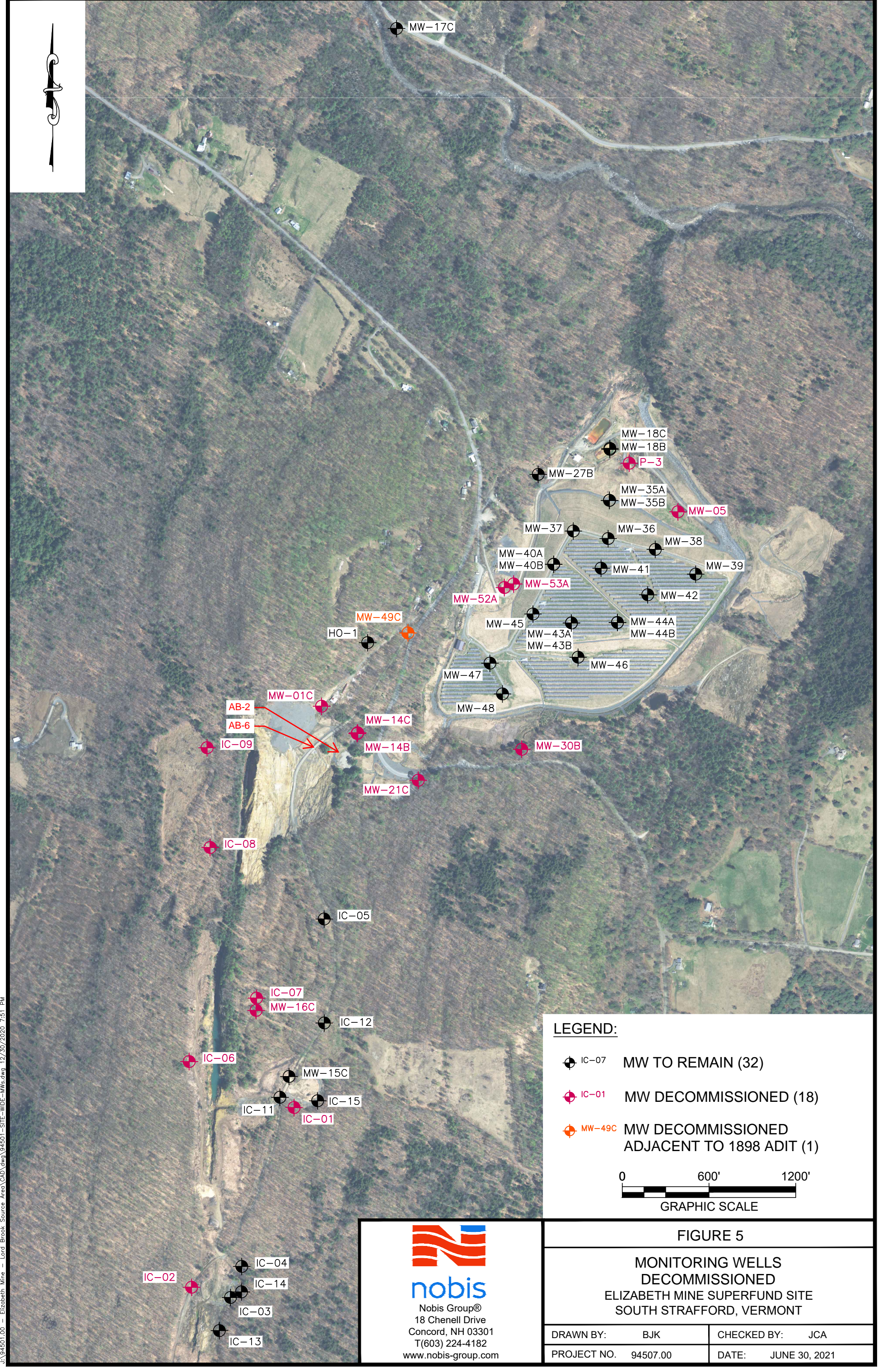
DATE: FEBRUARY 5, 2021



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J:\94501.00 - Elizabeth Mine - Lord Brook Source Area\CAD\dwg\94501-SITE-WIDE-MW.dwg 12/30/2020 7:51 PM

**LEGEND:**

-  IC-07 MW TO REMAIN (32)
-  IC-01 MW DECOMMISSIONED (18)
-  MW-49C MW DECOMMISSIONED ADJACENT TO 1898 ADIT (1)

0 600' 1200'  
GRAPHIC SCALE



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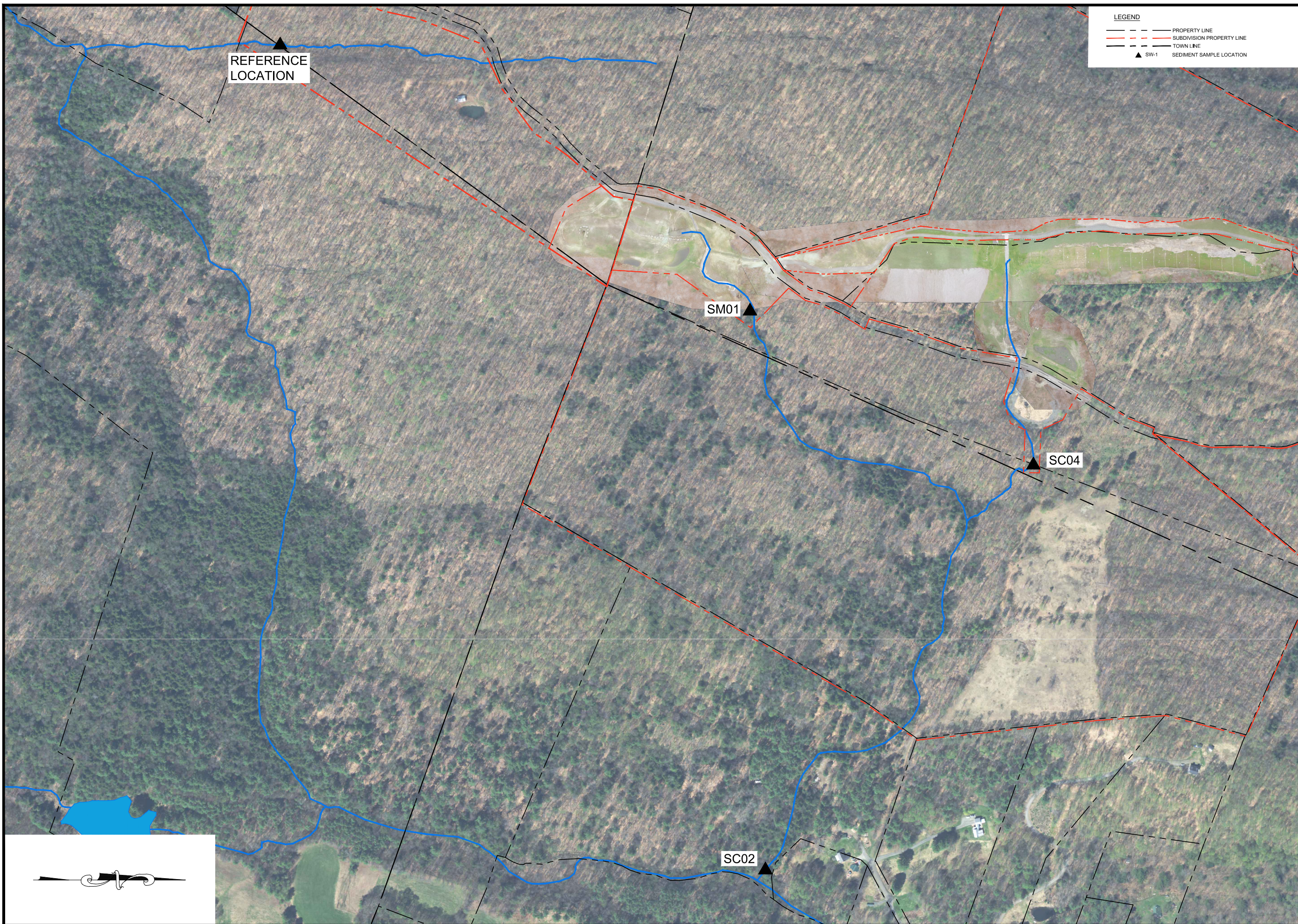
**FIGURE 5**

**MONITORING WELLS DECOMMISSIONED**  
**ELIZABETH MINE SUPERFUND SITE**  
**SOUTH STRAFFORD, VERMONT**

|                      |                     |
|----------------------|---------------------|
| DRAWN BY: BJK        | CHECKED BY: JCA     |
| PROJECT NO. 94507.00 | DATE: JUNE 30, 2021 |



J:\94507\_CO - Elizabeth Mine - Lead Break Source Area\CAD\Drawings\94507-PROPOSED WELL LOCATIONS SOC.dwg 1/28/2021 2:20 PM  
 PLOT FILE: J:\94507\_CO - Elizabeth Mine - Lead Break Source Area\CAD\Drawings\94507-PROPOSED WELL LOCATIONS SOC.dwg  
 PLOT DATE: 1/28/2021 2:20 PM  
 PLOT SCALE: 1:1  
 PLOT SIZE: 24" x 36"



**LEGEND**

- — — — — PROPERTY LINE
- — — — — SUBDIVISION PROPERTY LINE
- — — — — TOWN LINE
- ▲ SW-1 SEDIMENT SAMPLE LOCATION

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**ELIZABETH MINE SUPERFUND SITE**  
  
 NON-TIME CRITICAL REMOVAL ACTION  
  
 MINE ROAD SOUTH STRAFFORD, VERMONT

| NO. | DATE | DESCRIPTION |
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REVISIONS



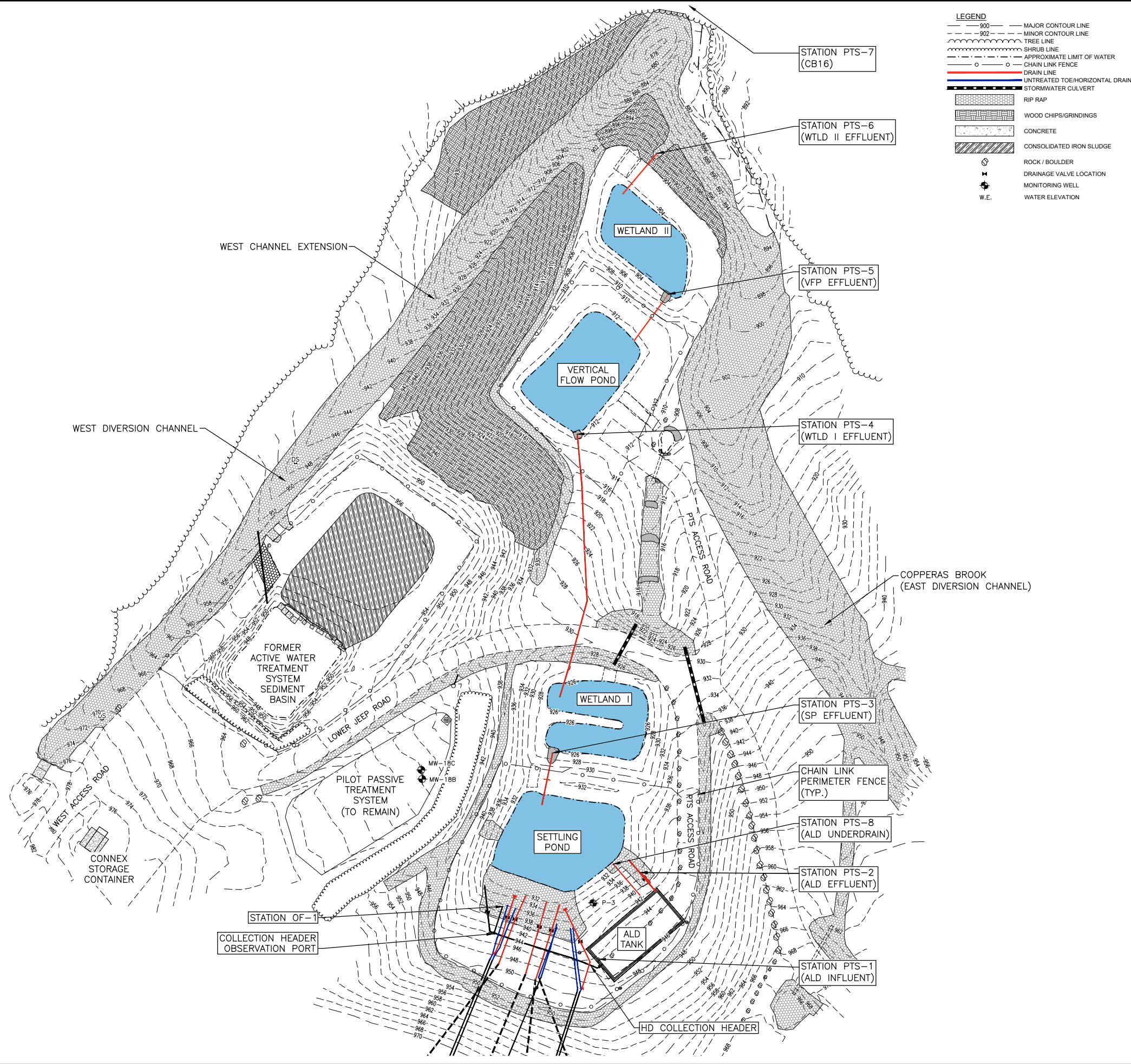
DATE: DEC. 30, 2020  
 NOBIS PROJECT NO. 94507.00  
 DRAWN BY: NZ  
 CHECKED BY: BK  
 CAD DRAWING FILE:  
 94507-PROPOSED WELL LOCATIONS SOC

SHEET TITLE

**SEDIMENT SAMPLING LOCATIONS**

FIGURE  
**6**





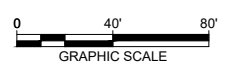
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**ELIZABETH MINE SUPERFUND SITE**

NON-TIME CRITICAL REMOVAL ACTION

MINE ROAD SOUTH STRAFFORD, VERMONT

| NO.       | DATE | DESCRIPTION |
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| REVISIONS |      |             |
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| DATE:             | DEC. 14, 2020                        |
| NOBIS PROJECT NO. | 94507.00                             |
| DRAWN BY:         | NZ                                   |
| CHECKED BY:       | CA                                   |
| CAD DRAWING FILE: | 94501-PTS-MODIFICATIONS AS-BUILT.dwg |
| SHEET TITLE       | PTS MONITORING LOCATIONS             |

**PTS MONITORING LOCATIONS**

FIGURE 7

J:\94501.00 - Elizabeth Mine - Land Brook Source Area\CAD\Drawings\Passive Treatment System\94501-PTS-MODIFICATIONS AS-BUILT.dwg 12/14/2020 3:55 PM

- NOTES:
- FIELD SURVEY PERFORMED BY DOUCET SURVEY ON NOVEMBER 4 & 5 2019 AND AUGUST 11 & 12 2020 USING A TRIMBLE S7 TOTAL STATION, A TRIMBLE R10 SURVEY GRADE GPS UNIT WITH A TRIMBLE TSC3 DATA COLLECTOR, AND A TRIMBLE DIMI DIGITAL AUTO LEVEL. TRAVERSE ADJUSTMENT BASED ON LEAST SQUARE ANALYSIS.
  - THIS DATA SET WAS TESTED TO MEET ASPRS POSITIONAL ACCURACY STANDARDS FOR DIGITAL GEOSPATIAL DATA (2014) FOR A 2.5 (CM) RMSEX / RMSEY HORIZONTAL ACCURACY CLASS. ACTUAL POSITIONAL ACCURACY WAS FOUND TO BE RMSEX = 1.9 CM AND RMSEY = 1.4 CM WHICH EQUATES TO POSITIONAL HORIZONTAL ACCURACY = +/-3.9 CM AT 95% CONFIDENCE LEVEL.
  - THIS DATA SET WAS TESTED TO MEET ASPRS POSITIONAL ACCURACY STANDARDS FOR DIGITAL GEOSPATIAL DATA (2014) FOR A 2.5 (CM) RMSEZ VERTICAL ACCURACY CLASS. ACTUAL NVA ACCURACY WAS FOUND TO BE RMSEZ = 1.2 CM, EQUATING TO +/- 2.4 CM AT 95% CONFIDENCE LEVEL.
  - HORIZONTAL DATUM BASED ON VERMONT STATE PLANE NAD83(CORS96) DERIVED FROM REDUNDANT GPS OBSERVATIONS UTILIZING THE KEYNET GPS VRS NETWORK.