

2015 WORK PLAN

for the
COMMUNITY ENVIRONMENTAL MONITORING PROGRAM
of the Eagle Mine
December 31, 2014



Submitted by



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Commonly Used Acronyms and Abbreviations

CEMP	Community Environmental Monitoring Program
CWB	Contact Water Basins
DEQ	Michigan Department of Environmental Quality
Eagle	Eagle Mine
EPA	U.S. Environmental Protection Agency
GW	Groundwater
GWDP	Groundwater Discharge Permit
HTDF	Humboldt Tailings Disposal Facility
MCCF	Marquette County Community Foundation
MP	Mine Permit
PM	Particulate Matter (dust) measured in microns
SWP	Superior Watershed Partnership
TBD	To Be Determined
TDRSA	Temporary Development Rock Storage Area
TWIS	Treated Water Infiltration System
WTP	Water Treatment Plant

Diagram of Eagle Mine Facilities



Diagram of Humboldt Mill Facilities



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Introduction

The Community Environmental Monitoring Program (CEMP) of the Eagle Mine is implemented by two community-based organizations; the Superior Watershed Partnership (SWP) and the Marquette County Community Foundation (MCCF). The CEMP is defined and governed by formal agreements between these organizations and Lundin Mining, who purchased the Eagle Mine from Rio Tinto during 2013. The CEMP is designed to build a comprehensive and accurate picture of any environmental impacts that may be a result of Eagle Mine's operations at the mine site, the Humboldt Mill, and along the designated Transportation Route. The CEMP is independent, transparent, and based on the highest scientific standards.

The CEMP consists of four main components: 1) Verification Monitoring, which includes verifying the environmental monitoring done by Eagle Mine as required by its permits 2) Additional monitoring, which includes environmental monitoring done by SWP over and above the monitoring that Eagle Mine is required to do under its permits; and 3) Publication of results and ratings of Eagle Mine's environmental performance; and 4) Community Outreach, to inform the public and provide opportunities for the community to provide input regarding CEMP activities.

The *Annual Work Plan* is organized into three sections that describe CEMP activities 1) Annual Monitoring Objectives, 2) Monitoring Results and Performance Ratings, and 3) Community Input and Public Outreach. The 2015 Work Plan marks the first year of environmental monitoring of Eagle Mine under the "operational" phase of production. A summary of the annual monitoring objectives including work plan tasks, standards and schedule for activities is provided in Table 1. Community Environmental Monitoring Program monitoring locations and parameters for laboratory analyses are provided in Figures 1-14 and Tables 2-13 respectively.

1. Annual Monitoring Objectives***1.1. Verification Monitoring and Data Review******1.1.1. Baseline Data Review***

The SWP will continue to review and evaluate pre-mining (baseline) environmental data as it relates to data generated during monitoring of mining operations. The SWP

recognizes that baseline data in and around the Eagle Mine includes data collected prior to September 2011. Data collected from the Humboldt Mill, Powell Township Air and Meteorological Station, and along the transportation route will be considered baseline through September 2014.

1.1.2. Operations Data Review

Eagle Mine will continue to provide SWP with operational data in the form of reports, a data base or summary format. SWP will review operations data from three perspectives. The first is to verify the validity (precision, accuracy representativeness) of the environmental monitoring data. The second is to analyze data for indications of impacts from the mining operations. The last is to analyze data from background (including upgradient, baseline and reference watershed monitoring points) for indications of local (e.g., logging), regional (e.g., atmospheric deposition) or global (e.g., climate change) impact related to other non-mine activity.

1.1.3. Procedures Review/Observations

SWP will continue to review and observe data collection at Eagle Mine and the Humboldt Mill during 2015. The objective of the procedures review and data collection observations are to verify that the procedures used are appropriate and will result in the generation of data sets that are representative of environmental conditions. SWP will carry out observations (flora/fauna, fisheries, and aquatic macroinvertebrates) at permit required monitoring sites at the Eagle Mine site (Figures 5 and 6) and the Humboldt Mill in conjunction with Eagle Mine's scheduled monitoring.

1.1.4. Interpretations Review

SWP will continue to interpret results of Eagle Mine's permit required environmental monitoring data. The interpretations review will focus primarily on assigning likely root cause (mine impacts, data quality issues or unrelated impacts) to monitoring point values that exceed permit specified benchmarks or thresholds. The SWP will utilize relevant baseline and secondary data (data from other sources) where appropriate to document

interpretations of results and/or make comparisons to other local or regional environmental data.

1.1.5. Split Sampling

SWP will carry out split sampling at permit required monitoring sites at the Eagle Mine site and the Humboldt Mill (groundwater, surface water, sediment and facilities) in conjunction with Eagle Mine's scheduled monitoring. Split sampling is when a sample taken from a single source (e.g. a groundwater well) is divided in two, with each sample analyzed by a different certified laboratory. Split samples will be conducted at Eagle Mine and the Humboldt Mill at the locations shown in Figures 1-3 and Figures 12-13 respectively, and described in Table 2. Samples will be submitted to an independent laboratory for analyses. Analytical parameters, methods and laboratory reporting limits for split sampling are presented in Tables 3-11. The samples may be analyzed for the full parameter list or a subset of the parameters specified for that monitoring point. The objective of the split sampling is to verify that the laboratories used are appropriate and the results are representative of environmental conditions.

1.2. Additional Monitoring

1.2.1. Powell Township Air Quality

During November of 2012, an air quality and meteorological station was installed in Powell Township per the *CEMP Agreement*. The station is located in the community of Big Bay behind Crams General Store (Figures 7 and 8). The air monitoring equipment measures particulate matter (dust) in the 10 micron size range (PM10) on a continuous basis and particulate matter in the 2.5 micron size range (PM2.5) on a biweekly basis following a schedule and standards established by the U.S. EPA's Ambient Air Monitoring Program. Particulate matter filters are also retained for quarterly laboratory analysis of metal concentrations (Table 12). The meteorological station measures wind speed and direction, temperature, barometric pressure, precipitation, solar radiation, and relative humidity. The objective of the Powell Township air quality monitoring station is to generate data that can be used to identify potential air quality impacts in the

community that may be a result of mining operations. Data collected from the Powell Township station will be considered baseline through September 2014.

1.2.2. Eagle Mine Air Quality

Air quality monitoring in and around the Eagle Mine site includes the collection of air quality monitoring data using a portable particulate monitoring device that measures particulate matter in the 10 micron size range (PM10). The equipment also has the capability to monitor particulate matter as small as 1 micron in size (PM1). Additional secondary data that will be evaluated includes air quality (PM10) and meteorological data from the Eagle Mine air/meteorological station (data provided by Eagle Mine) located just west of the surface facility (Figure 7 and 8). The objective of the portable air quality monitoring at the mine site is to provide data for evaluation of potential air quality impacts from mining operations. Data collected using the portable air monitoring equipment will be compared to National Air Quality Standards and will be considered baseline through September 2014.

1.2.3. Transportation Route Monitoring

Environmental monitoring along the transportation route includes collection of water quality data at 28 road stream crossing sites (Figure 14, Table 13), air quality data (particulate matter) using a portable monitoring device (Figures 7, 9, and 10), and noise monitoring (TBD). Additional secondary data that may be evaluated and/or collected along the transportation route includes weather and traffic data. The objective of the surface water quality, portable air quality, and noise monitoring along the transportation route is to evaluate potential impacts from transportation of ore during mining operations. Data collected along the transportation route will be considered baseline through September 2014.

1.2.4 Humboldt Mill Air Quality

Additional environmental monitoring at the Humboldt Mill includes the collection of air quality monitoring data using a portable particulate monitoring device that measures particulate matter in the 10 micron size range (PM10) (Figures 7, 11). The equipment

also has the capability to monitor particulate matter as small as 1 micron in size (PM₁). Additional secondary data includes meteorological data from Eagle Mine's floating meteorological station located on the water surface at the north end of the Humboldt Tailings Disposal Facility (HTDF). The objective of the portable air quality monitoring at the mill site is to provide data for evaluation of potential air quality impacts from mill operations. Data collected using the portable air monitoring equipment will be considered baseline through September 2014.

1.2.5 Other Based on Results or New Activities

The SWP may also collect additional data near the mine, mill, and along the transportation route during 2015 based on results or new information, community input, and/or new activities. SWP will provide Eagle Mine with a plan (including locations, procedures, methodologies and standards) for any additional monitoring prior to commencing with monitoring activities.

2. Monitoring Results and Performance Ratings

2.1 Data Processing/Publication

2.1.1 Data Processing

SWP laboratory(s) will deliver monitoring results in electronic format to SWP no later than 45 days of receipt of samples and the data will be processed by SWP within 5 working days of receipt from the laboratory. Primary processing will consist of verification that samples, parameters, analytical methods, and detection limits were completed as requested. Secondary processing will consist of the evaluation of laboratory quality control data and duplicate data for evidence of quality control issues. Tertiary processing will consist of comparison of data to appropriate baseline data, permit specified criteria/benchmarks, or other agreed upon state or federal criteria. The final data processing step will follow receipt of Eagle data and consist of the assessment of data precision by comparison Eagle's laboratory derived values with values produced by SWP's laboratory(s). Data processing procedures will be conducted in a manner consistent with the *CEMP Agreement*, the *CEMP Notification Plan* and other agreed upon standards/operating procedures.

2.1.2 Data Publication/Notification

Data publication and notification processes are defined in the *CEMP Agreement*, as amended, and the *CEMP Notification Plan*. This includes procedures for 1) sharing information related to data anomalies and/or other events; 2) serious risks and/or breaches of permits or other applicable environmental regulations; 3) release of information; and 4) other results received by SWP or Eagle Mine.

Once data has been received from the laboratory and processed according to the procedures described above, SWP will make results available to the public on the CEMP website (www.cempmonitoring.com). The CEMP website/data portal is designed to build a comprehensive and accurate picture of Eagle Mine's environmental data and to make this information available to the public in a format that is easy to use and easily understood.

The website includes an interactive GIS-based data portal that can display data spatially, graphically or in tabular formats. Data can also be downloaded from the site in excel or pdf formats. Spatial displays show environmental monitoring locations relative to topography, structures, hydrology and aerial imagery. Spatial displays also highlight environmental monitoring locations where parameters have been detected at concentrations that exceed permit specified criteria/benchmarks.

Graphical displays consist of charts that illustrate which parameters were sampled at a monitoring location or which environmental monitoring stations have data for a parameter. For a specified monitoring period, users can plot reported concentrations of one or two parameters at one environmental monitoring location or for one parameter at multiple environmental monitoring locations. Tables can be produced for each graphical display conveying the information in the chart along with additional information such as data source, sampling time, or laboratory reporting limits. During 2015, updates to the CEMP website/data portal include addition of environmental monitoring data for the Humboldt Mill and Transportation Route.

2.2 Performance Ratings

2.2.1 CEMP Report Card

The CEMP Report Card is located on the CEMP website and includes a red light, yellow light, and green light system used by SWP to rate Eagle Mine on its environmental performance. Performance ratings, based on environmental monitoring results, will be completed on a quarterly basis or more frequently by location (Mine, Mill, or Transportation Route) and type of monitoring (facilities, groundwater, surface water, flora/fauna, etc. air, etc.). The red light used in the rating indicates potential harm to the environment/potential permit violation; a yellow light indicates an area of concern, data discrepancy, or area that is being tracked; and a green light indicates no known risks to the environment. A white or blank light indicates an area that was not rated. The Report Card webpage also includes a link to the interactive data portal for those who wish to view or download the environmental monitoring data. During 2015, updates to the CEMP website/data portal include addition of performance ratings for the Humboldt Mill and Transportation Route.

2.2.2 CEMP Monitoring Reports

At a glance, the CEMP Report Card indicates if there is an area of concern related to Eagle Mine's environmental performance with either yellow or red light ratings. These "lights" also serve as links (via a click and a pop-up box) to an explanation or summary of the reason(s) for the concern/color rating(s) or a more detailed Monitoring Report. Monitoring Reports will be continued to be developed as new issues arise, using language that is easy to understand for a broad audience. The objective of the monitoring reports is to describe the issue, potential risk to the environment, and measures taken by the CEMP program and Eagle Mine to address the situation. In addition, monthly summary reports describing the previous month's monitoring activities will continue to be posted to the CEMP website and distributed via CEMP mail lists and social media.

2.2.3 Eagle Mine Scorecard

The SWP will also rate Eagle Mine on its environmental performance with a simplified version of the CEMP Report Card for inclusion in Eagle's Community Scorecard. A

figure (slide and/or diagram) depicting the CEMP Report Card will be provided to Eagle Mine at least 30 days before its scheduled community forums in a format that can be easily incorporated into Eagle's Scorecard. The Eagle Mine Scorecard will be presented at Eagle's community forums, public mine tours; posted to Eagle Mine's website (www.eaglemine.com) and published in the local newspaper.

3. Community Outreach

3.1 Community Meetings and Forums

During 2015, the SWP will host community forums in the City of Marquette, Powell Township (Big Bay), Humboldt Township, and Michigamme Township to inform the public about the CEMP and to gather input regarding community concerns and suggestions for additional monitoring activities. The community forum meeting dates/times will be determined in cooperation with the CEMP Technical Committee and Policy Group and will be publicized on the CEMP website, and through local media outlets and notification lists. The SWP will also present CEMP information upon request from local schools and university departments, community groups, and at other public events/forums.

3.2 Public Outreach Activities

During 2015, the SWP will continue to conduct public outreach using the CEMP website (www.cempmonitoring.com), local news/media outlets, social media (Facebook and Twitter), printed materials, video, and publications to inform the public about CEMP activities. The SWP will respond to questions and inquiries and gather public input from public meetings, the CEMP website (via email), and the CEMP Hotline (906) 228-6095 Ext. 20; and participate in broad (regional and international) distribution of the CEMP *Case Studies* and other program information and findings to other communities and interested parties.






Community Environmental Monitoring Program 2015 BUDGET	
MANAGEMENT FEE	
Marquette County Community Foundation Management Fee (5%)	\$ 15,000
TOTAL MCCF	\$ 15,000
PROJECT MANAGEMENT and STAFFING	
Monitoring	\$142,130
Senior Planner (468 hrs @ \$95 Fee for Service Rate*)	
Field Technician (1,456 hrs @ \$45 Fee for Service Rate)	
Field Technician (520 hrs @ \$45 Fee for Service Rate)	
Executive Director (70 hrs @ \$125 Fee for Service Rate)	
Public Outreach / Meetings	\$ 47,750
Public Outreach Coordinator (520 hrs @ \$75 Fee for Service Rate)	
Executive Director (70 hrs @ \$125 Fee for Service Rate)	
Administrative Assistance	\$ 16,820
Administrator (208 hrs @ \$40 Fee for Service Rate)	
Executive Director (68 hrs @ \$125 Fee for Service Rate)	
TOTAL PROJECT MANAGEMENT AND STAFFING	\$206,700
CONTRACTUAL	
Laboratory Analysis (Water)	\$ 42,450
Laboratory Analysis (Air - Particulates)	\$ 1,500
Laboratory Analysis (Air - Metals)	\$ 2,800
Maintenance/Calibration (Air - BAM)	\$ 500
Maintenance/Calibration (Air - MET)	\$ 800
Lease Fee Powell Township Air Station	\$ 900
Consultant - Technical Support	\$ 10,000
Consultant – Website Hosting	\$ 3,600
Training/Certifications	\$ 1,200
Website Maintenance	\$ 4,680
TOTAL CONTRACTUAL	\$ 68,430
SUPPLIES AND MATERIALS	
Printing (educational materials, reports, etc.)	\$ 300
Public Meetings (media announcements, room rental, etc.)	\$ 500
Field and Office supplies/materials	\$ 800
FedEx Shipping	\$ 3,000
Monitoring Equipment (Purchase/Rental)	\$ 750
TOTAL OUTREACH & SUPPLIES	\$ 5,350
TRAVEL	
Travel to meetings, field sites, etc.	\$ 4,520
TOTAL TRAVEL	\$ 4,520
TOTAL 2015 FUNDING	\$300,000

Note: Fee for Service Rates for SWP staff includes 10-40% in fringe benefits (health insurance, social security, workers compensation, retirement, etc.) and approximately 35% in overhead costs (lease, utilities, office equipment, etc.).



Mine Permit Surface Water Monitoring Locations

Legend

-  SW Monitoring Station
-  Mine Facilities
-  Road
-  Hydrography
-  Watershed Boundary

Reference

Projection & Datum: UTM NAD 83 Zone 16N

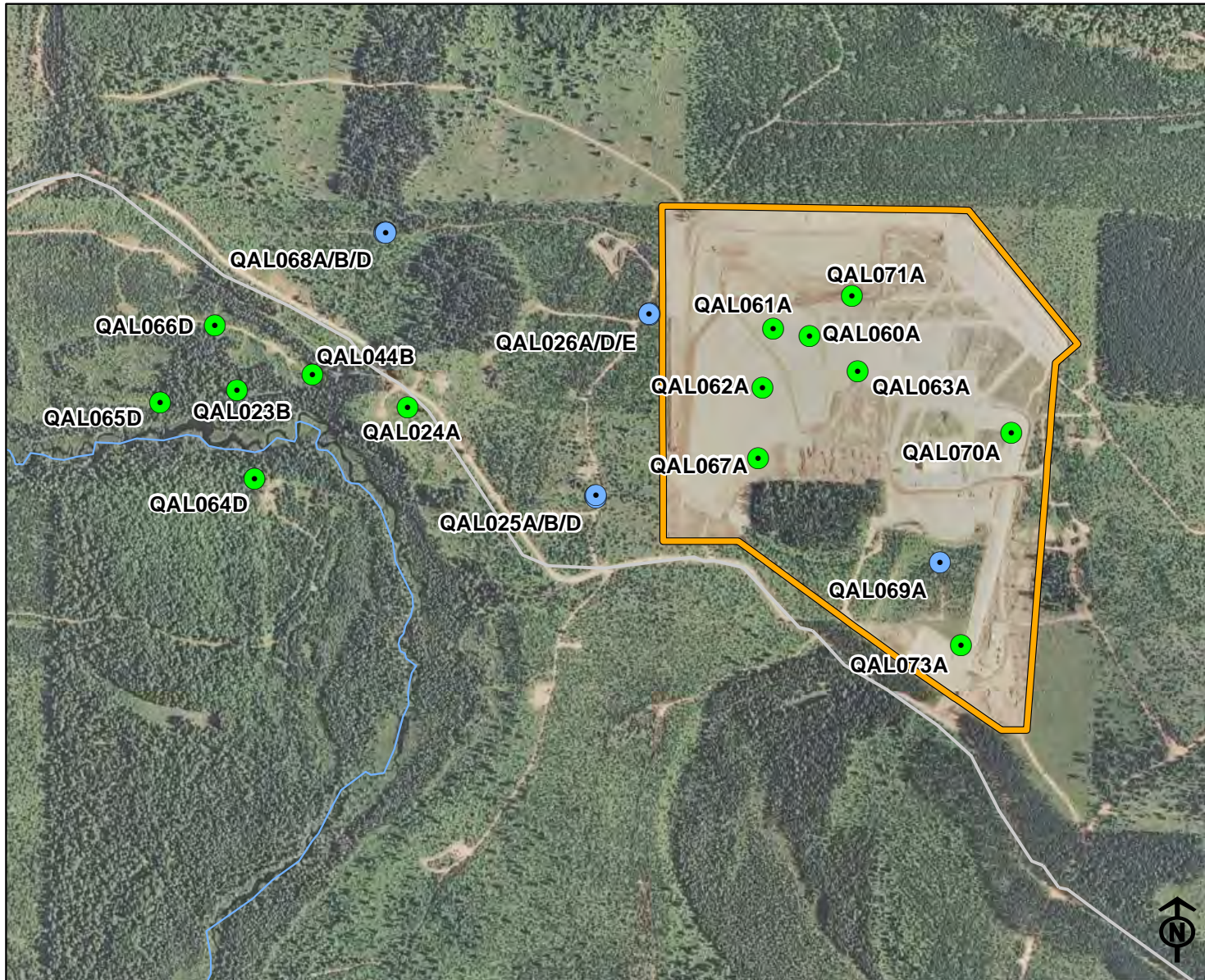
0 1.25 2.5 5 Miles

1:200,000



Community Environmental
Monitoring Program

Figure: 1



Mine Permit Groundwater Monitoring Locations

Legend

- Background Well
- Compliance Well
- Mine Facilities
- Road
- ~ Hydrography

Reference

Projection & Datum: UTM NAD 83 Zone 18N

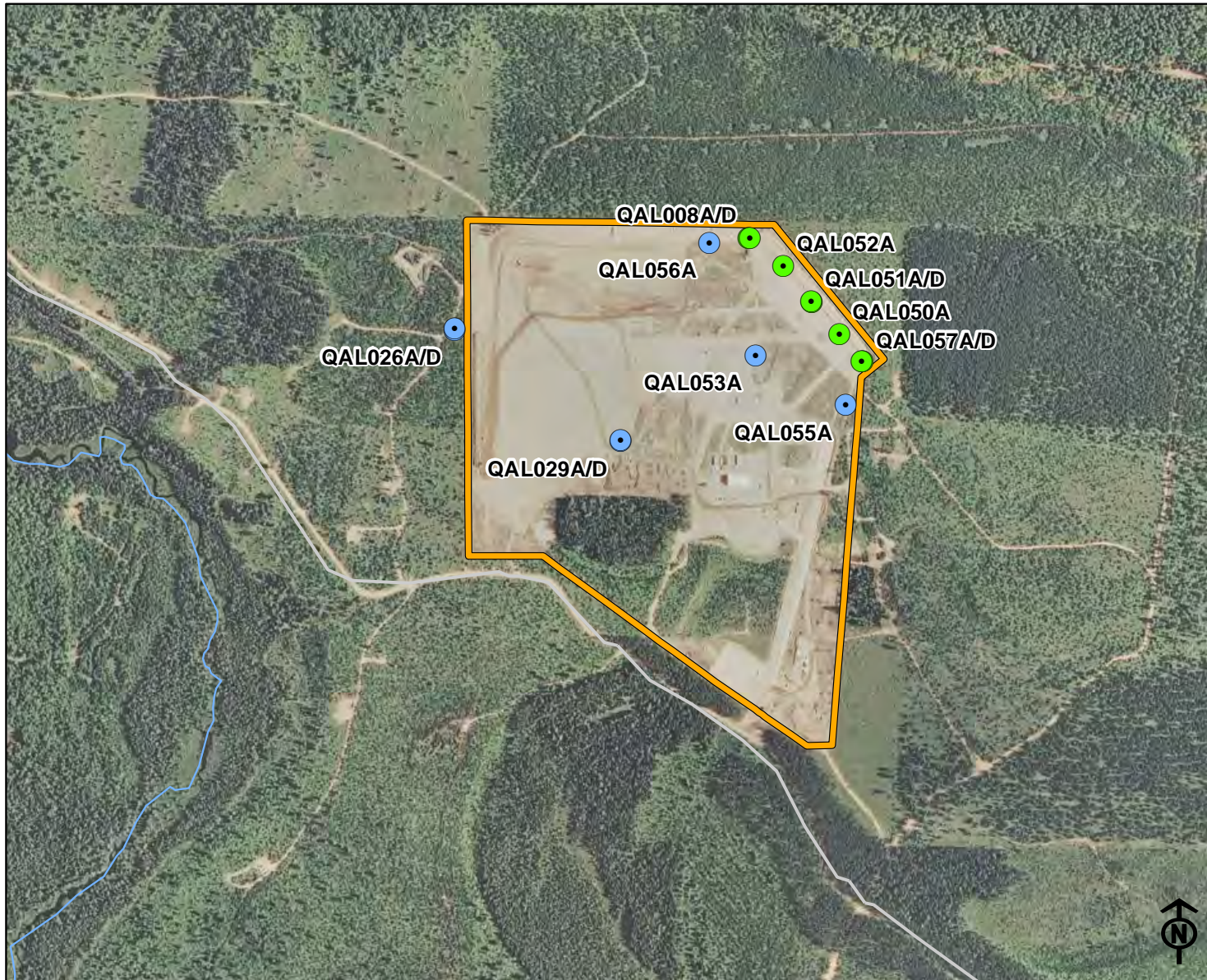
0 0.05 0.1 0.2 Miles

1:12,000



Community Environmental
Monitoring Program

Figure: 2



Groundwater Discharge Permit Monitoring Locations

Legend

- Compliance Well
- Background Well
- Mine Facilities
- Road
- ~ Hydrography

Reference

Projection & Datum: UTM NAD 83 Zone 16N

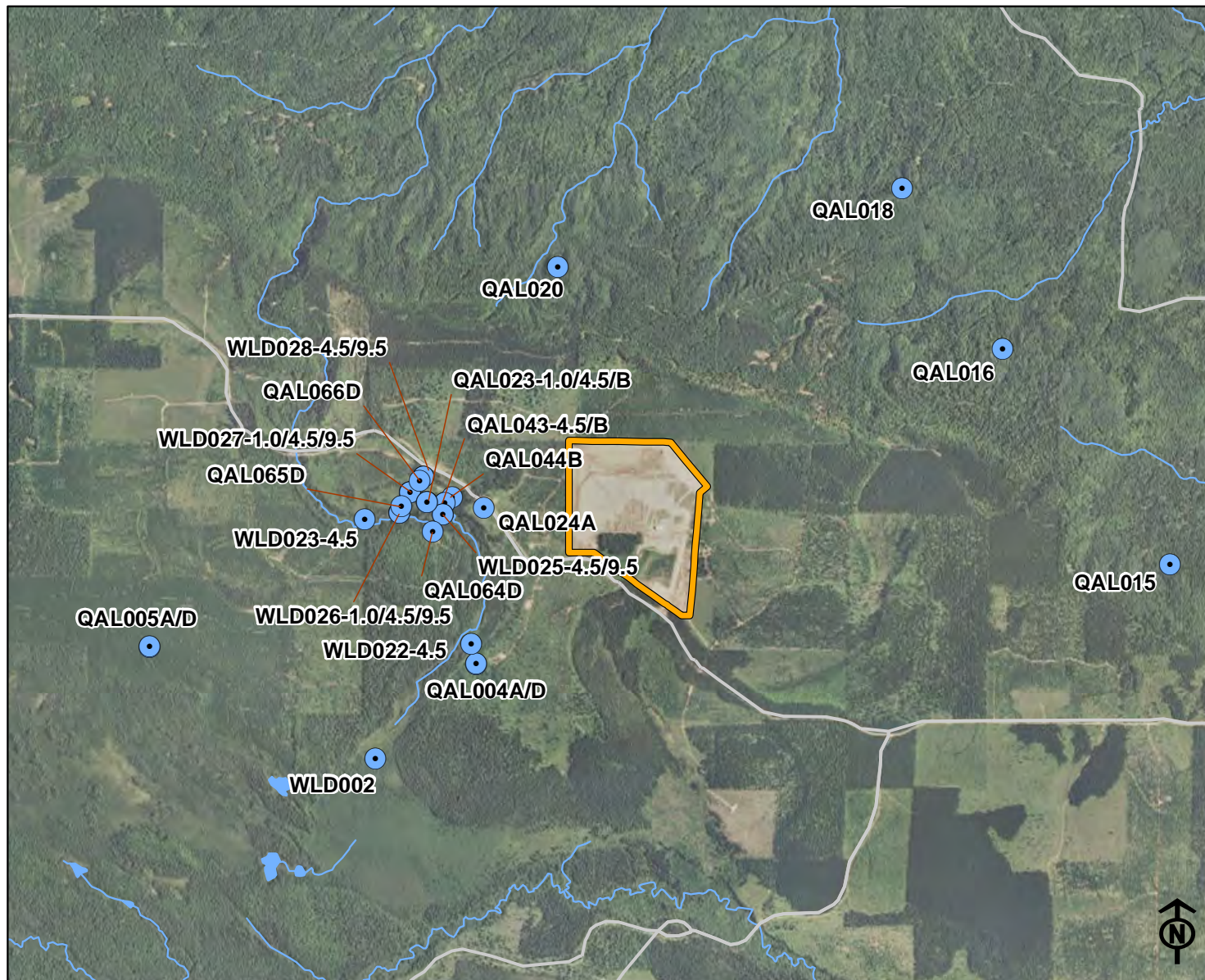
0 0.05 0.1 0.2 Miles

1:12,000



Community Environmental
Monitoring Program

Figure: 3



Mine Permit Groundwater Elevation Monitoring Locations

Legend

- GW Elevation Monitoring Well
- Mine Facilities
- Road
- ~ Hydrography

Reference

Projection & Datum: UTM NAD 83 Zone 18N

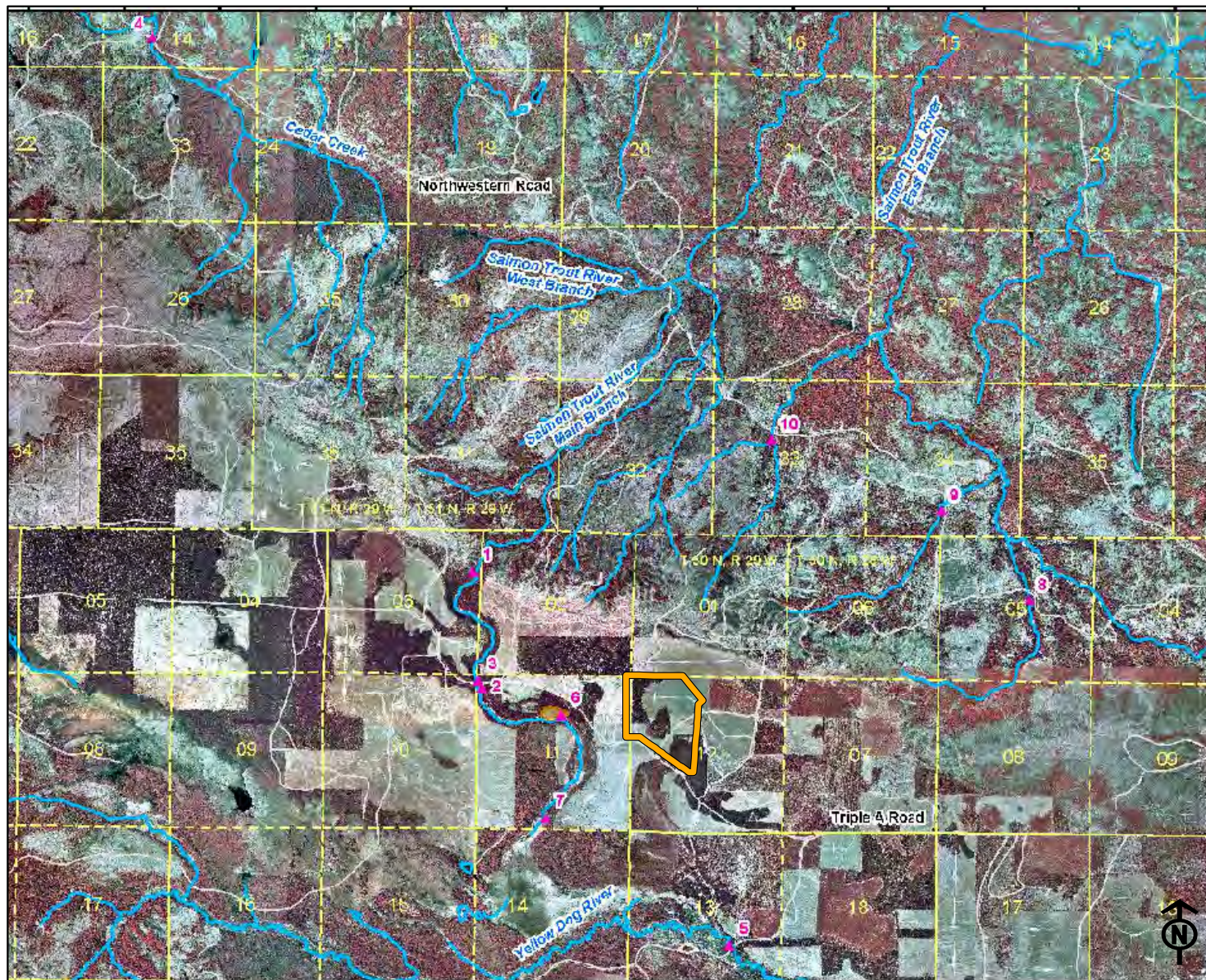
0 0.2 0.4 0.8 Miles

1:36,000



Community Environmental
Monitoring Program

Figure: 4



Aquatic Sampling Monitoring Locations

Legend

- ▲ Aquatic Sampling Monitoring Station
- Mine Facilities
- Road
- ~ Hydrography

Reference

Projection & Datum: UTM NAD 83 Zone 16N

0 0.375 0.75 1.5 Miles

1:65,000



Community Environmental
Monitoring Program

Figure: 5

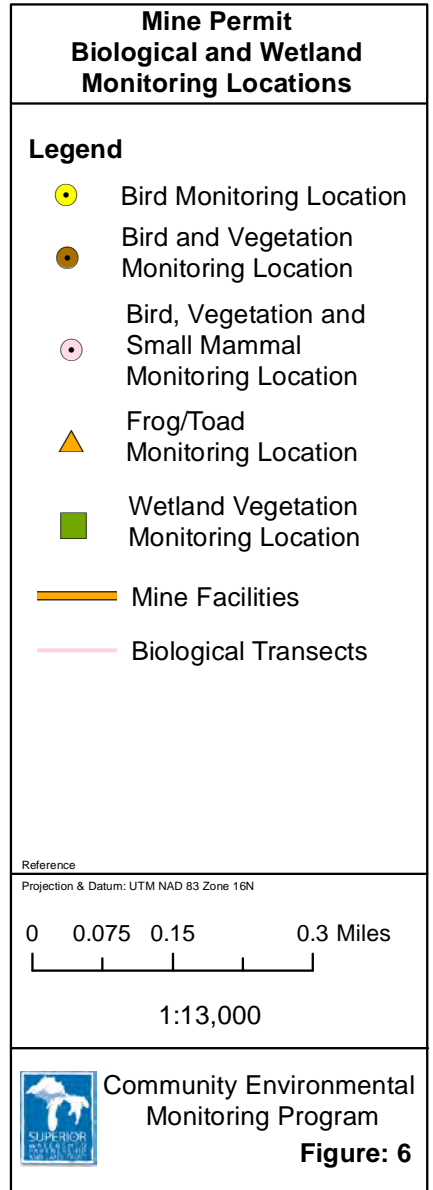
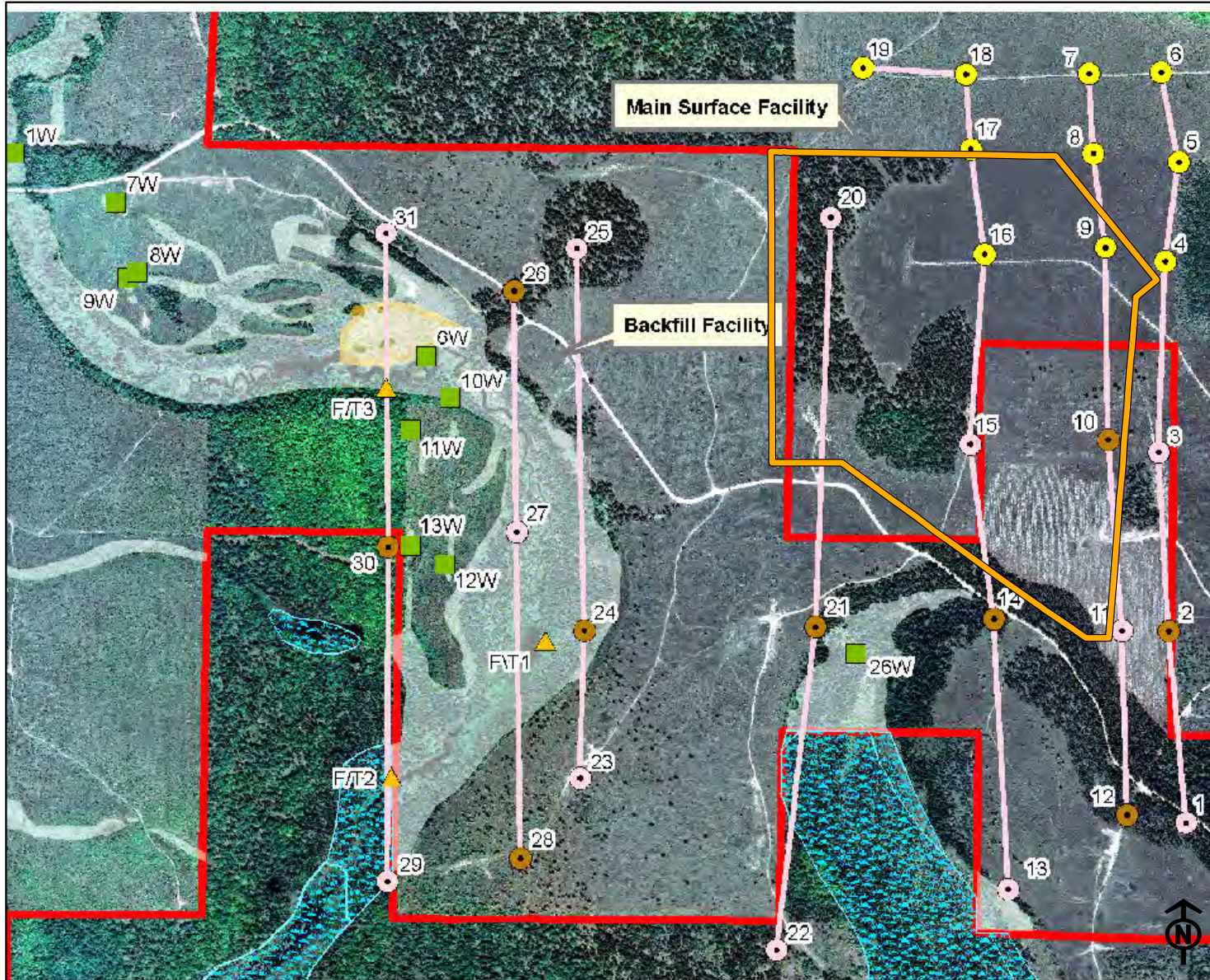
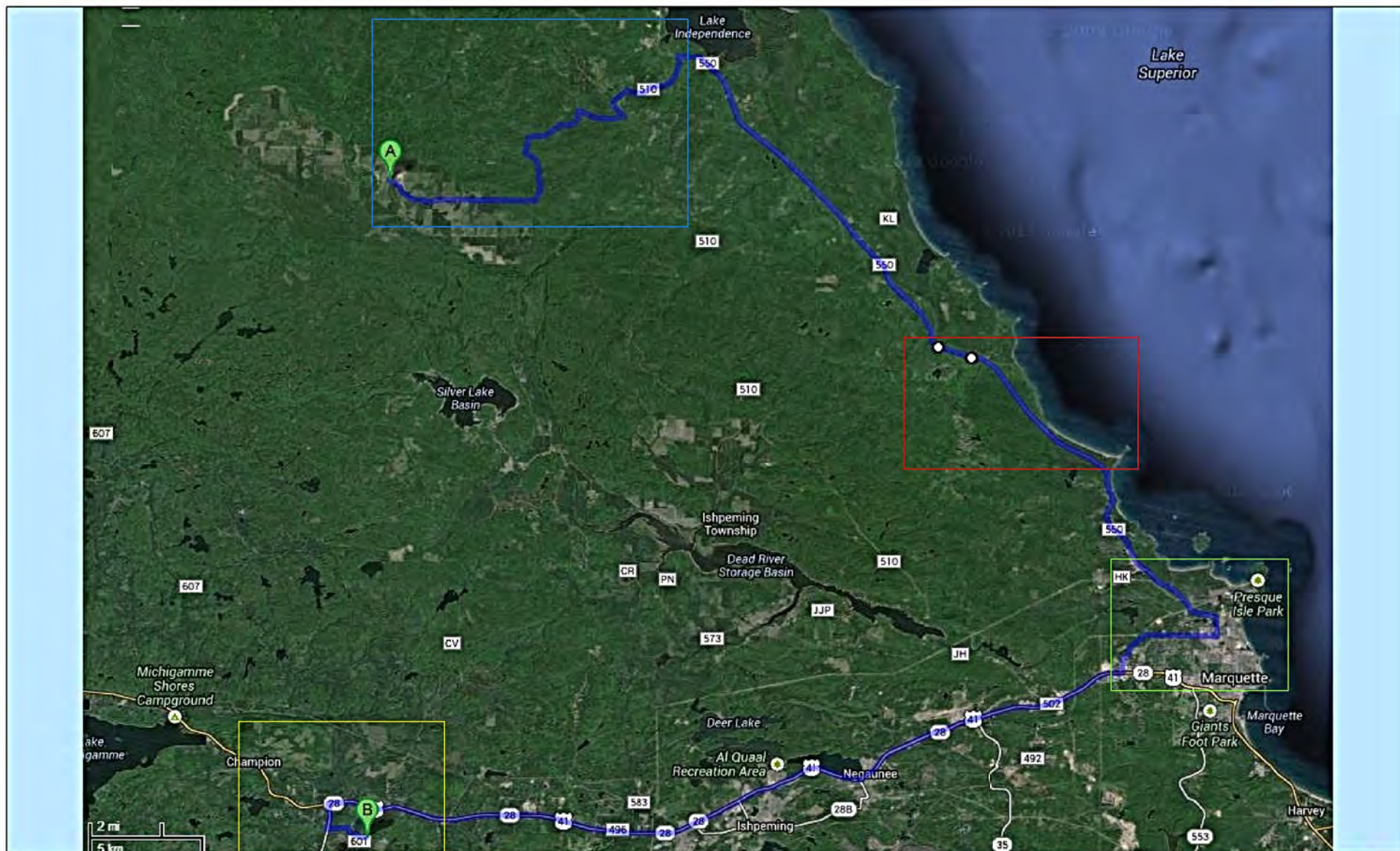


Figure 7

CEMP Portable Air Quality Monitoring Sites Locator Map

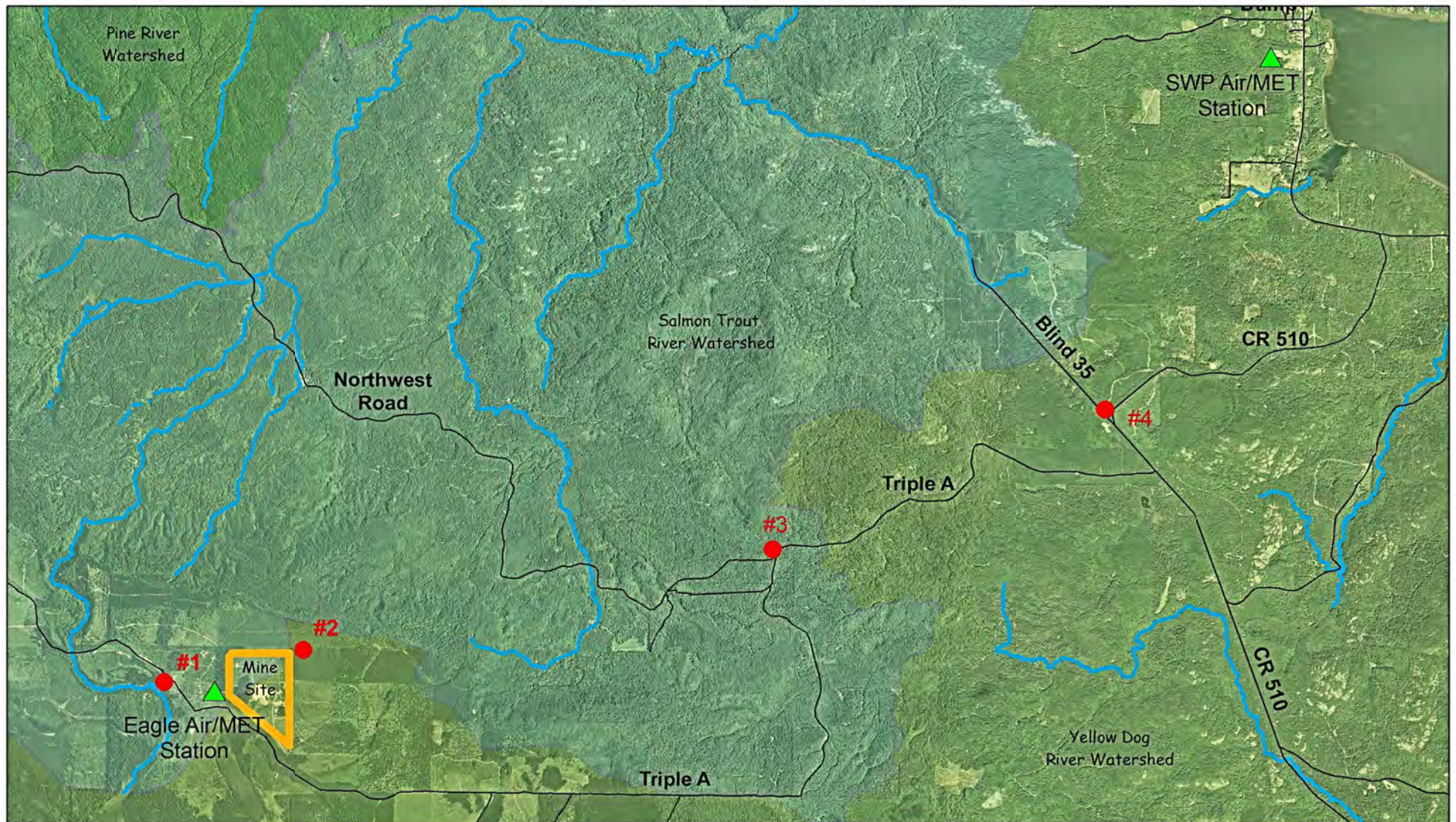


Mine Sites	Co. Rd. 550 Sites
Mill Sites	City of Marquette Sites



Figure 8

CEMP Portable Air Quality Monitoring Sites



0 0.375 0.75 1.5 2.25 3 Miles

- #1.....Vent Raise
- #2.....Northeast of Fence at Mine
- #3.....Intersection of Triple A and Northwest Road
- #4.....Intersection of Co.Rd. 510 and Blind 35
- Fixed.....Fixed Air Station in Big Bay



Figure 9

CEMP Portable Air Quality Monitoring Sites



0 0.2 0.4 0.8 1.2 1.6 Miles

#5.....MCRC Wetland Restoration Site

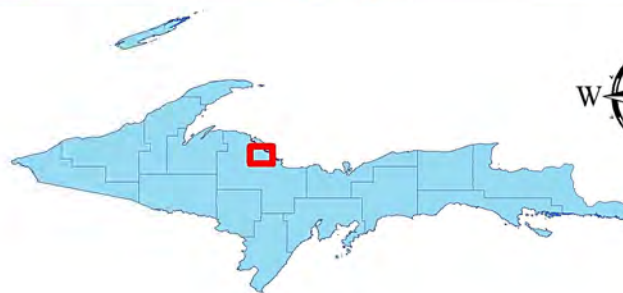


Figure 10

CEMP Portable Air Quality Monitoring Sites

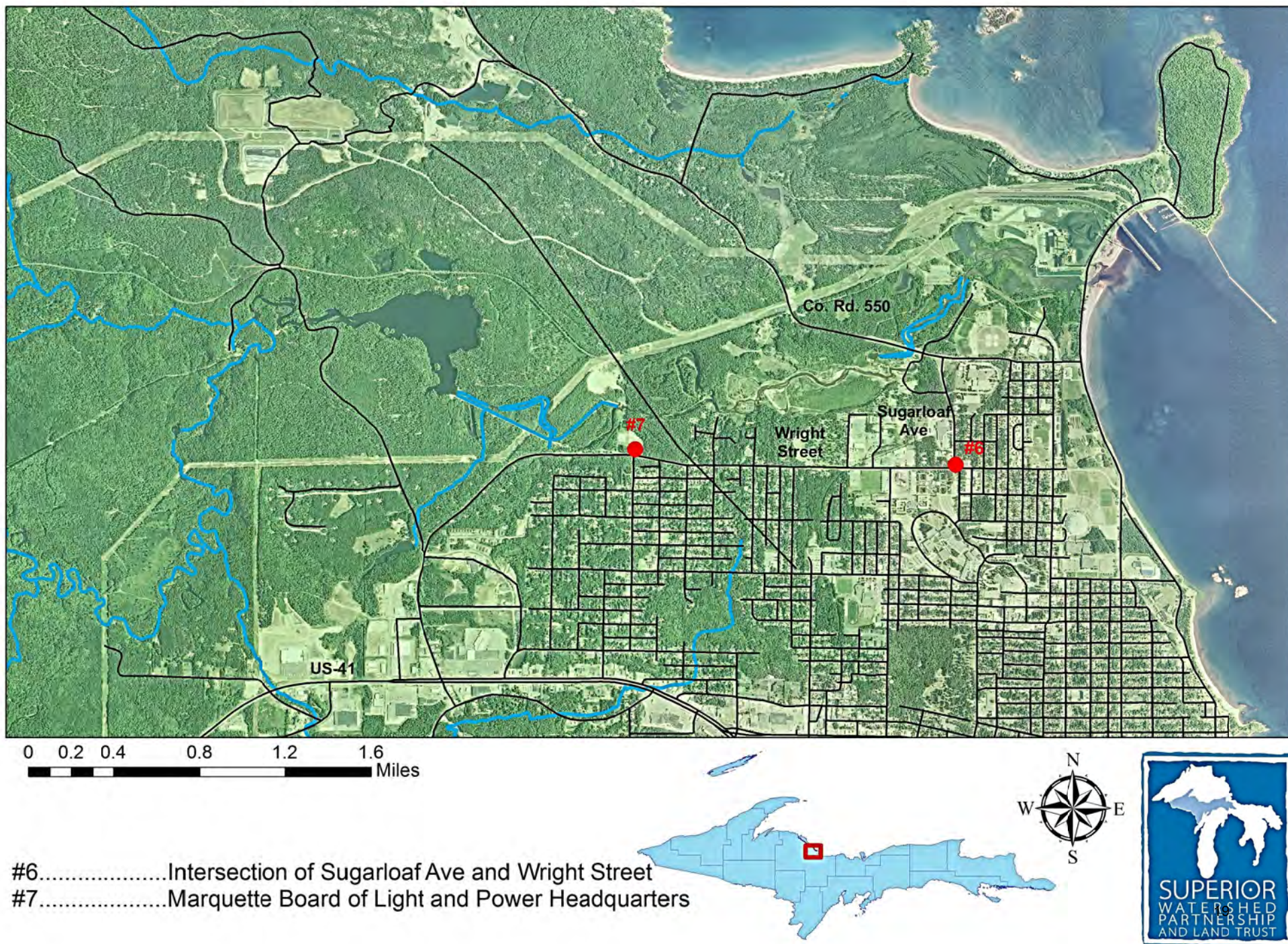
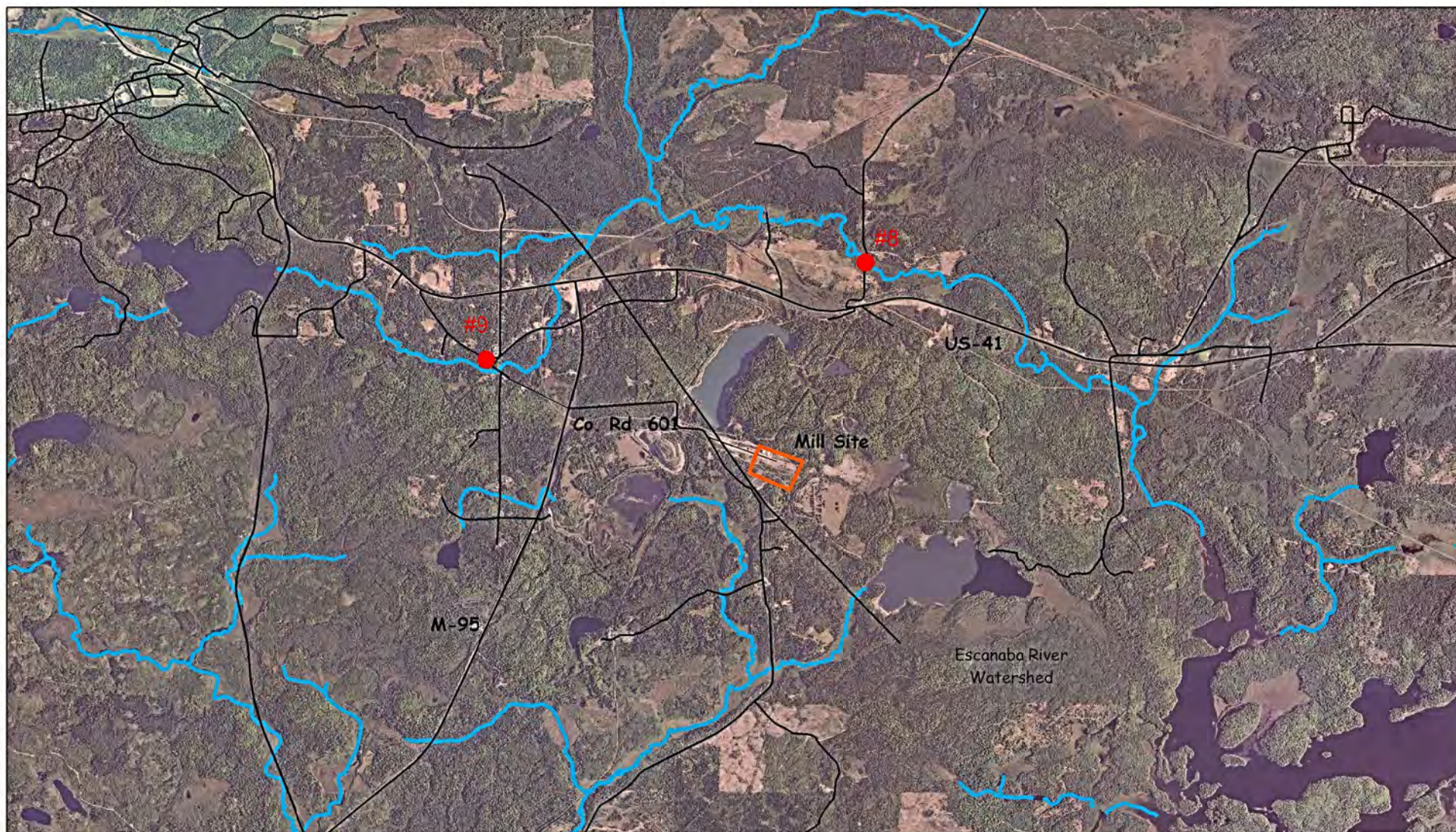


Figure 11

CEMP Portable Air Quality Monitoring Sites

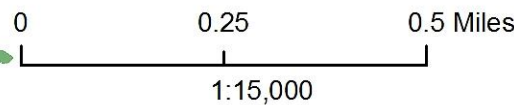
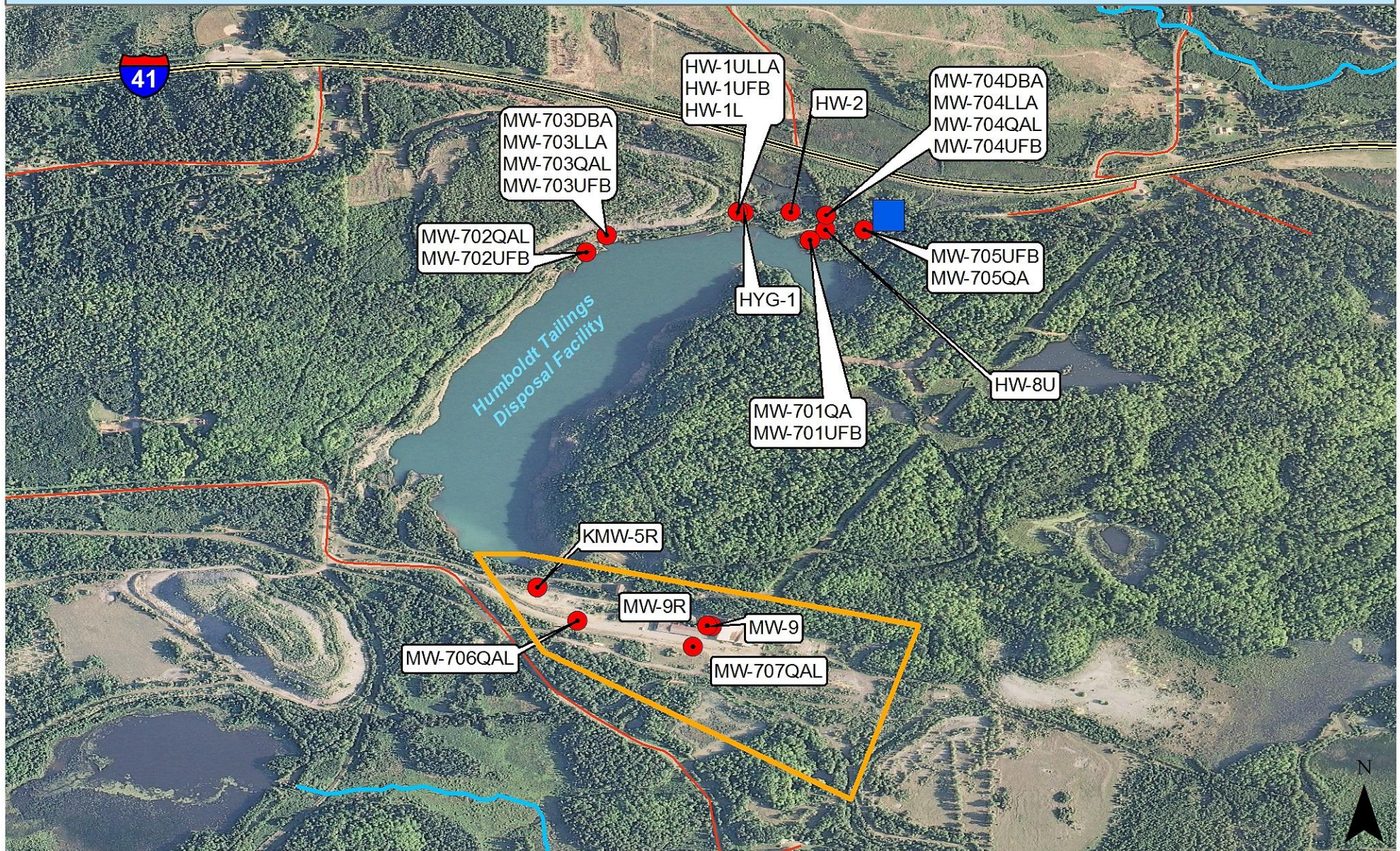


- #8.....Wolf Lake Road at the Middle Branch Escanaba River
#9.....Co. Rd. 601 at Humboldt Cemetery



Figure 12

Humboldt Mill Mine Permit Groundwater Monitoring Locations

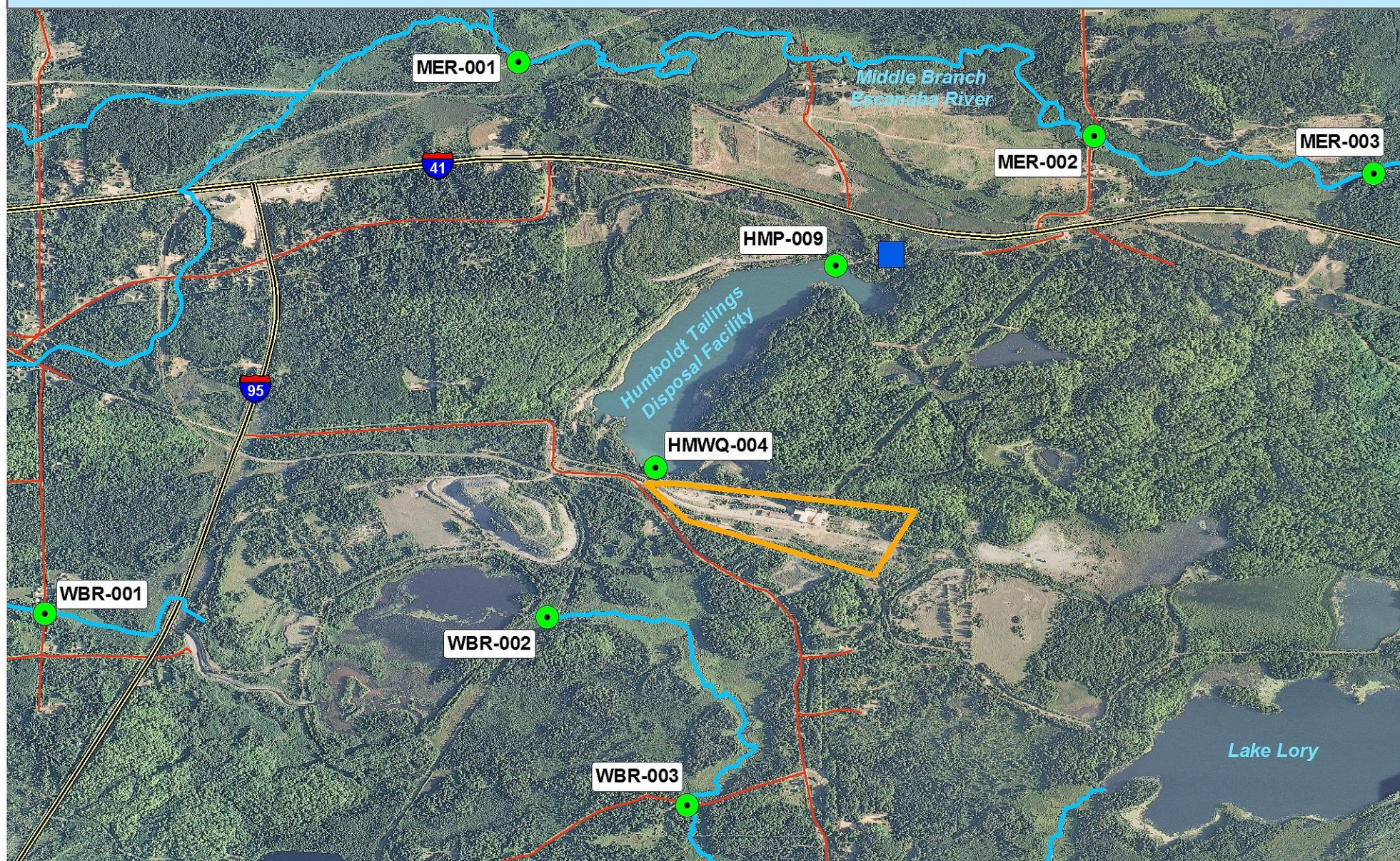


- All Roads
- River
- == State Roads
- Groundwater Monitoring Sites
- Humboldt Mill Water Treatment Plant
- Humboldt Mill



Figure 13

Humboldt Mill Mine Permit Surface Water/Sediment Monitoring Locations



0 0.25 0.5 Miles
1:24,000

— All Roads
— River
== State Roads

● Surface Water/Sediment Sites
■ Humboldt Mill Water Treatment Plant
□ Humboldt Mill



Transportation Route Surface Water Quality Monitoring Sites

Figure 14



- Surface Water Monitoring Sites
- Transportation Route
- Lake/River/Reservoir
- City
- Township
- Eagle Mine/Mill

0 5 10 Miles
1:220,000



Table 1.
Summary of 2015 Annual Monitoring Objectives

WORK PLAN TASK	SITE(S)	PARAMETERS	STANDARDS	PERIOD	FREQUENCY
Verification Monitoring and Data Review					
Baseline Data Review	Permit compliance and background monitoring sites (Mine and Mill)	Review of pre-mining data (groundwater, surface water, air, aquatics, and flora and fauna)	Part 632 Rule and Applicable Permits (Mining, Groundwater Discharge, Inland Lakes and Streams, and NPDES)	Mine data collected prior to September 2011, Mill data through September 2014	Ongoing
Operations Data Review	Permit compliance and background monitoring sites (Mine and Mill)	Review of operations data (groundwater, surface water, and wastewater, solid waste, air, aquatics, flora and fauna)	Part 632 Rule and Applicable Permits (Mining, Groundwater Discharge, Inland Lakes and Streams, and NPDES)	Mine data collected after September 2011, Mill data collected after September 2014	Ongoing, based on Eagle Mine scheduled monitoring
Procedures Review/Observations	Permit compliance and background monitoring sites (Mine and Mill)	Review of procedures and field data collection (groundwater, surface water, and wastewater, solid waste, air, aquatics, flora and fauna)	Part 632 Rule and Applicable Permits (Mining, Groundwater Discharge, Inland Lakes and Streams, and NPDES)	2015	Ongoing, based on Eagle Mine scheduled monitoring
Interpretation Review	Permit compliance and background monitoring sites (Mine and Mill)	Interpretation of results: groundwater, surface water, and facilities wastewater (quantity, elevation, flow, and quality); solid waste (quantity, quality); flora and fauna, aquatics (diversity and numbers)	Part 632 Rule and Applicable Permits (Mining, Groundwater Discharge, Inland Lakes and Streams, and NPDES)	2015	Ongoing, based on Eagle Mine scheduled monitoring
Split Sampling	Permit compliance and background monitoring sites (Mine and Mill)	Groundwater, surface water, and facilities wastewater, solid waste	Part 632 Rule and Applicable Permits (Mining, Groundwater Discharge, Inland Lakes and Streams, and NPDES)	2015	Ongoing, based on Eagle Mine scheduled monitoring

Table 1.
Summary of 2015 Annual Monitoring Objectives

WORK PLAN TASK	SITE(S)	PARAMETERS	STANDARDS	PERIOD	FREQUENCY
Additional Monitoring					
Powell Township Air Quality	Stationary Air/Meteorological Station in Big Bay	PM10, PM2.5, metals, wind speed and direction, air temperature, relative humidity, and solar radiation	National Ambient Air Quality Standards and Michigan Air Toxic Screening Levels	2015; Data represents "operations" phase of production	Continuous (PM10, meteorological data), EPA biweekly schedule (PM2.5), Quarterly (Metals)
Eagle Mine Air Quality	2 sites near Eagle Mine	Portable Air Quality Monitoring (PM10); Meteorological/Particulate Matter data from permanent stations at Big Bay and Eagle Mine (Secondary Data)	National Ambient Air Quality Standards	2015; Data represents "operations" phase of production	Quarterly
Transportation Route Air Quality	3 sites along Transportation Route	Portable Air Quality Monitoring (PM10); Wind/weather data from NOAA and/or Meteorological/Particulate Matter data from permanent stations at Big Bay and Eagle Mine (Secondary Data); Traffic Counts (Secondary Data)	National Ambient Air Quality Standards	2015; Data represents "operations" phase of production	Quarterly
Transportation Route Noise	5-10 sites along Transportation Route	Noise monitoring; Traffic Counts (Secondary Data)	Michigan Noise Standards (MIOSHA)	2015; Data represents "operations" phase of production	Quarterly
Transportation Route Surface Water Quality	28 sites along Transportation Route	Surface water quality at road stream crossings	Michigan/EPA Surface Water Quality Standards	2015; Data represents "operations" phase of production	Annually
Humboldt Mill Air Quality	2 sites near Humboldt Mill	Portable Air Quality Monitoring (PM10); Meteorological data from floating station at Humboldt Tailings Disposal Facility	National Ambient Air Quality Standards	2015; Data represents "operations" phase of production	Quarterly

Table 1.
Summary of 2015 Annual Monitoring Objectives

WORK PLAN TASK	SITE(S)	PARAMETERS	STANDARDS	PERIOD	FREQUENCY
Other Based on Community Input, Results and/or New Activities	Sites (TBD) near Eagle Mine, Humboldt Mill, and/or Transportation Route	TBD	TBD	2015; Data represents "operations" phase of production	TBD
Monitoring Results and Performance Ratings					
Data Processing/Publication	N/A	Results from CEMP laboratory/Eagle Mine data posted to website/data portal	CEMP Agreement and Notification Plan	2015	Monthly
Performance Ratings	N/A	CEMP Report Card, Monitoring Reports, Eagle Mine Scorecard	CEMP Agreement and Notification Plan	2015	Quarterly or as needed (Report Card/Monitoring Reports), Biannually (Eagle Scorecard)
Community Outreach					
Community Meetings/Forums	N/A	Community Forums, other meetings/presentations to community groups, etc.	CEMP Agreement and Notification Plan	2015	Ongoing
Public Outreach Activities	N/A	CEMP website, local news/media, email updates, social media, CEMP hotline, etc.	CEMP Agreement and Notification Plan	2015	Ongoing

Table 2
Summary of Permit Required “Split Sampling” Monitoring Sites at
Eagle Mine and the Humboldt Mill

Monitoring Location/Type	Permit	Frequency	Total Number of Monitoring Sites
EAGLE MINE			
Surface Water	Mine Permit	Quarterly	11
Groundwater	Mine Permit	Quarterly	24 (10 background and 14 compliance)
Facilities: Temporary Development Rock Storage Area (TDRSA) Contact Water Sump and Leak Detection Sump, Contact Water Basins/WTP Influent, and Underground	Mine Permit	Quarterly	4
Facilities: Water Treatment Facility	Groundwater Discharge Permit	Monthly	1
Groundwater	Groundwater Discharge Permit	Quarterly	15 (7 background and 8 compliance)
Total Eagle Mine Sites			55
HUMBOLDT MILL			
Groundwater	Mine Permit	Quarterly	23
Surface Water	Mine Permit	Quarterly	8
Sediment	Mine Permit	Quarterly	7
Facilities: Water Treatment Facility	Surface Water Discharge Permit	Monthly	1
Total Humboldt Mill Sites			39

Table 3
Eagle Mine - Mine Permit Surface Water Monitoring
Parameters, Frequency, Analytical Method and Laboratory Reporting Limits

Parameters	Frequency	Analytical Method ¹	Laboratory Reporting Limit	Units
Field				
Temperature	Quarterly	Field	na	°C
Dissolved Oxygen	Quarterly	Field	na	mg/L
pH	Quarterly	Field	na	SU
Specific Conductance	Quarterly	Field	na	umhos/cm
Flow	Quarterly	Field	na	cfs
Anions				
Alkalinity, Bicarbonate	Annual	310.1/SM 2320 B	2.0	mg/L
Alkalinity Carbonate	Annual	310.1/SM 2320 B	2.0	mg/L
Chloride	Annual	EPA-325.2/4599-CL E	1.0	mg/L
Flouride	Annual	SM 4500 F-C	0.10	mg/L
Nitrate Nitrogen	Annual	EPA-353.2/4500 NO3F	0.050	mg/L
Sulfate	Quarterly	EPA-375.4/9038	1.0	mg/L
Cations				
Calcium	Annual	EPA-200.7/6010B	0.50	mg/L
Potassium	Annual	EPA-200.7/6010B	0.50	mg/L
Magnesium	Annual	EPA-200.7/6010B	0.50	mg/L
Sodium	Annual	EPA-200.7/6010B	0.50	mg/L
Total Dissolved Solids	Quarterly	EPA-160.1	50	mg/L
Metals				
Aluminum	Annual	EPA-200.7/6010B	50	ug/L
Lithium	Annual	EPA-200.7/6010B	10	ug/L
Antimony	Annual	EPA-200.8/6020	2.0	ug/L
Arsenic	Quarterly	EPA-200.8/6020	1.0	ug/L
Barium	Annual	EPA-200.8/6020	10	ug/L
Iron	Quarterly	EPA-200.7/6010B	20	ug/L
Beryllium	Annual	EPA-200.8/6020	1.0	ug/L
Boron	Quarterly	EPA-200.8/6020	50	ug/L
Cadium	Annual	EPA-200.8/6020	0.20	ug/L
Chromium	Annual	EPA-200.8/6020	1.0	ug/L
Copper	Quarterly	EPA-200.8/6020	1.0	ug/L
Cobalt	Quarterly	EPA-200.8/6020	10	ug/L
Lead	Annual	EPA-200.8/6020	1.0	ug/L
Manganese	Quarterly	EPA-200.8/6020	10	ug/L
Molybdenum	Annual	EPA-200.8/6020	10	ug/L
Nickel	Quarterly	EPA-200.8/6020	1.0	ug/L
Selenium	Quarterly	EPA-200.8/6020	2.0	ug/L
Silver	Annual	EPA-200.8/6020	0.20	ug/L
Zinc	Quarterly	EPA-200.8/6020	10	ug/L
Mercury ¹	Quarterly	EPA-1631E	0.00025	ug/L

¹ Acceptable by MDEQ to use 0.005 ug/L as reporting limit for mercury.

Table 4
Eagle Mine - Mine Permit Groundwater Monitoring
Parameters, Frequency, Analytical Methods, and Laboratory Reporting Limits

Parameters	Frequency of Analysis	Analytical Method ²	Laboratory Reporting Limit	Units
Field				
Static Water Elevation	Quarterly	Field	--	ft/msl
Redox	Quarterly	Field	--	meV
Temperature	Quarterly	Field	--	°C
Dissolved Oxygen	Quarterly	Field	--	mg/L
pH	Quarterly	Field	--	su
Specific Conductance	Quarterly	Field	--	umhos/cm
Anions				
Alkalinity, Bicarbonate	Quarterly	310.1	2.0	mg/L
Alkalinity Carbonate	Quarterly	310.1	2.0	mg/L
Nitrate Nitrogen	Quarterly	EPA-353.2	0.050	mg/L
Sulfate	Quarterly	EPA-375.4	2.0-5.0	mg/L
Flouride	Annual	SM 4500 F-C	0.10	mg/L
Chloride	Quarterly	EPA-325.2	1.0	mg/L
Cations				
Calcium	Annual	EPA-6010B	0.50	mg/L
Sodium	Quarterly	EPA-6010B	0.50	mg/L
Magnesium	Annual	EPA-6010B	0.50	mg/L
Potassium	Annual	EPA-6010B	0.50	mg/L
Metals				
Aluminum	Annual	EPA-6010B	50	ug/L
Antimony	Annual	EPA-6020	5.0	ug/L
Arsenic	Quarterly	EPA-6020	2.0	ug/L
Barium	Annual	EPA-6020	20	ug/L
Beryllium	Annual	EPA-6020	1.0	ug/L
Boron	Quarterly	EPA-6010B	100	ug/L
Cadmium	Annual	EPA-6020	0.50	ug/L
Chromium	Annual	EPA-6020	5.0	ug/L
Cobalt	Annual	EPA-6010B	10	ug/L
Copper	Quarterly	EPA-6020	5.0	ug/L
Iron	Quarterly	EPA-6010B	20	ug/L
Lead	Annual	EPA-6020	1.0	ug/L
Lithium	Annual	EPA-6010B	8.0	ug/L
Manganese	Quarterly	EPA-6010B	20	ug/L
Mercury ¹	Quarterly	EPA-1631E	0.00025	ug/L
Molybdenum	Annual	EPA-6020	10	ug/L
Nickel	Quarterly	EPA-6020	25	ug/L
Selenium	Quarterly	EPA-6020	1.0	ug/L
Silver	Annual	EPA-6020	0.20	ug/L
Strontium	Annual	EPA-6010B	50	ug/L
Thallium	Annual	EPA-200.8/6020	2.0	ug/L
Vanadium	Annual	EPA-200.8/6020	10	ug/L
Zinc	Quarterly	EPA-6020	10	ug/L

¹ Acceptable by MDEQ to use 0.005 ug/L as reporting limit for mercury

² Acceptable to use equivalent or improved analytical methods

-- Indicates the permit does not specify this information.

Table 5
Eagle Mine - Mine Permit Facilities (TDRSA and CWB) Monitoring
Parameters, Frequency, Analytical Methods, and Laboratory Reporting Limits

Parameters	Frequency of Analysis	Analytical Method ¹	Laboratory Reporting Limit	Units
Static Water Elevation	Quarterly	Field	0.01	ft
Alkalinity, Bicarbonate	Quarterly	310.1/SM 2320 B	2	mg/L
Alkalinity Carbonate	Quarterly	310.1/SM 2320 B	2	mg/L
Nitrate Nitrogen	Annual	EPA-353.2/4500 NO3F	0.05	mg/L
pH	Quarterly	Field	--	su
Specific Conductance	Quarterly	Field	--	umhos/cm
Sulfate	Quarterly	EPA-375.4/9038	1	mg/L
Chloride	Quarterly	EPA-325.2/4599-CL E	1	mg/L
Sodium	Annual	EPA-200.7/6010B	0.5	mg/L
Antimony	Annual	200.8/6020	2	ug/L
Arsenic	Quarterly	200.8/6020	1	ug/L
Barium	Annual	200.8/6020	10	ug/L
Beryllium	Annual	200.8/6020	1	ug/L
Boron	Quarterly	200.8/6020	50	ug/L
Cadium	Annual	200.8/6020	0.2	ug/L
Calcium	Annual	200.7/6010B	0.5	mg/L
Chromium	Annual	200.8/6020	1	ug/L
Cobalt	Annual	200.8/6020	10	ug/L
Copper	Quarterly	200.8/6020	1	ug/L
Flouride	Annual	SM 4500 F-C	0.1	mg/L
Iron	Quarterly	200.7/6010B	20	ug/L
Lead	Annual	200.8/6020	1	ug/L
Lithium	Annual	200.7/6010B	10	ug/L
Magnesium	Annual	200.7/6010B	0.5	mg/L
Manganese	Quarterly	200.8/6020	10	ug/L
Mercury	Quarterly	1631/----	0.00025	ug/L
Molybdenum	Annual	200.8/6020	10	ug/L
Nickel	Quarterly	200.8/6020	1	ug/L
Potassium	Annual	200.7/6010B	0.5	mg/L
Selenium	Quarterly	200.8/6020	2	ug/L
Silver	Annual	200.8/6020	0.2	ug/L
Strontium	Annual	200.8/6020	50	ug/L
Thallium	Annual	200.8/6020	2	ug/L
Vanadium	Annual	200.8/6020	10	ug/L
Zinc	Quarterly	200.8/6020	10	ug/L

¹ Acceptable to use equivalent or improved analytical methods.

-- Indicates the permit does not specify this information.

Table 6
Eagle Mine - Groundwater Discharge Permit WTP Effluent Monitoring
Parameters, Frequency, Analytical Methods, and Laboratory Reporting Limits

Parameters	Frequency of Analysis	Analytical Method ¹	Laboratory Reporting Limit	Units
Influent Flow	Daily	--	--	GPD
Effluent Flow	Daily	--	--	GPD
Biochemical Oxygen	Weekly	--	--	mg/l
Dissolved Oxygen	Monthly	--	--	mg/l
Ammonia Nitrogen	Monthly	--	--	mg/l
Nitrate Nitrogen	Monthly	--	--	mg/l
Nitrite Nitrogen	Monthly	--	--	mg/l
pH (Minimum)	Continuous Measurement	--	--	S.U.
pH (Maximum)	Continuous Measurement	--	--	S.U.
Total Phosphorus	Monthly	--	--	mg/l
Specific Conductance	Continuous Measurement	--	--	umhos/cm
Total Aluminum	Monthly	--	--	mg/l
Total Antimony	Monthly	200.8/6020	1	ug/l
Total Arsenic	Weekly	200.8/6020	1	ug/l
Total Barium	Monthly	200.8/6020	5	ug/l
Total Beryllium	Monthly	200.8/6020	1	ug/l
Total Boron	Weekly	200.8/6020	20	ug/l
Total Cadmium	Weekly	200.8/6020	0.2	ug/l
Total Chloride	Monthly	--	--	mg/l
Total Chromium	Monthly	200.8/6020	1	ug/l
Total Cobalt	Monthly	200.8/6020	15	ug/l
Total Copper	Weekly	200.8/6020	1	ug/l
Total Fluoride	Monthly	--	--	ug/l
Total Iron	Monthly	--	--	ug/l
Total Lead	Monthly	200.8/6020	1	ug/l
Total Lithium	Monthly	200.8/6020	8	ug/l
Total Manganese	Monthly	200.8/6020	5	ug/l
Total Mercury	Weekly	1631/----	0.0005	ug/l
Total Molybdenum	Monthly	200.8/6020	25	ug/l
Total Nickel	Monthly	200.8/6020	2	ug/l
Total Potassium	Monthly	--	--	ug/l
Total Selenium	Weekly	200.8/6020	1	ug/l
Total Silver	Weekly	200.8/6020	0.2	ug/l
Total Sodium	Monthly	--	--	mg/l
Total Strontium	Monthly	200.8/6020	5	ug/l
Total Sulfate	Monthly	--	--	ug/l
Total Thallium	Monthly	200.8/6020	2	ug/l
Total Vanadium	Monthly	200.8/6020	2	ug/l
Total Zinc	Monthly	200.8/6020	10	ug/l

¹ Acceptable to use equivalent or improved analytical methods.

-- Indicates the permit does not specify this information.

Table 7
Eagle Mine - Groundwater Discharge Permit Groundwater Monitoring
Parameters, Analytical Methods, and Laboratory Reporting Limits

Parameters	Frequency of Analysis	Analytical Method ¹	Laboratory Reporting Limit	Units
Field				
Static Water Elevation	Quarterly	Field	--	USGS-Ft
Dissolved Oxygen	Quarterly	Field	--	mg/l
pH (Minimum)	Quarterly	Field		S.U.
pH (Maximum)	Quarterly	Field		S.U.
Specific Conductance	Quarterly	Field	--	mmhos/cm
Anions				
Bicarbonate	Quarterly	--	--	mg/l
Chloride	Quarterly	--	--	mg/l
Ammonia Nitrogen	Quarterly	--	--	mg/l
Nitrate Nitrogen	Quarterly	--	--	ug/l
Nitrite Nitrogen	Quarterly	--	--	ug/l
Total Phosphorus	Quarterly	--	--	mg/l
Sulfate	Quarterly	--	--	mg/l
Cations				
Calcium	Quarterly	--	--	mg/l
Sodium	Quarterly	--	--	mg/l
Magnesium	Quarterly	--	--	mg/l
Potassium	Quarterly	--	--	mg/l
Metals				
Antimony	Quarterly	200.8/6020	1	ug/l
Arsenic	Quarterly	200.8/6020	1	ug/l
Barium	Quarterly	200.8/6020	5	ug/l
Beryllium	Quarterly	200.8/6020	1	ug/l
Boron	Quarterly	200.8/6020	20	ug/l
Cadium	Quarterly	200.8/6020	0.2	ug/l
Chromium	Quarterly	200.8/6020	1	ug/l
Cobalt	Quarterly	200.8/6020	15	ug/l
Copper	Quarterly	200.8/6020	1	ug/l
Iron	Quarterly	--	--	mg/l
Lead	Quarterly	200.8/6020	1	ug/l
Lithium	Quarterly	200.8/6020	8	ug/l
Manganese	Quarterly	200.8/6020	5	mg/l
Mercury	Quarterly	1631/----	0.0005	ug/l
Molybdenum	Quarterly	200.8/6020	25	ug/l
Nickel	Quarterly	200.8/6020	2	ug/l
Selenium	Quarterly	200.8/6020	1	ug/l
Silver	Quarterly	200.8/6020	0.2	ug/l
Strontium	Quarterly	200.8/6020	5	ug/l
Thallium	Quarterly	200.8/6020	2	ug/l
Vanadium	Quarterly	200.8/6020	2	ug/l
Zinc	Quarterly	200.8/6020	10	ug/l

¹ Acceptable to use equivalent or improved analytical methods.

-- Indicates the permit does not specify this information.

Table 8
Humboldt Mill - Mine Permit Groundwater Monitoring
Parameters, Frequency of Analysis, Analytical Methods, and Laboratory Reporting Limits

Parameters	Frequency of Analysis	Sample Type	Analytical Method	Laboratory Reporting Limit	Units
Field					
Static Water Elevation	Quarterly	Measured	Field	NA	ft/msl
Redox	Quarterly	Measured	Field	NA	meV
Temperature	Quarterly	Measured	Field	NA	°C
Dissolved Oxygen	Quarterly	Measured	Field	NA	mg/L
pH	Quarterly	Grab	Field	NA	su
Turbidity	Quarterly	Grab	Field	NA	NTU
Specific Conductance	Quarterly	Grab	Field	--	umhos/cm
Anions					
Alkalinity, Bicarbonate	Quarterly	Grab	310.2/SM 2320 B	2	mg/L
Alkalinity Carbonate	Quarterly	Grab	310.2/SM 2320 B	2	mg/L
Nitrate Nitrogen	Quarterly	Grab	353.2/4500 NO3F	0.05	mg/L
Nitrite Nitrogen	Quarterly	Grab	354.1/4500 NO3F or 353.2	0.05	mg/L
Nitrogen, Ammonia	Quarterly	Grab	350.1/4500 NH3 G	0.025	mg/L
Sulfate	Quarterly	Grab	ASTMD516-90(02)	100	mg/L
Sulfide	Quarterly	Grab	376.1/4500 S2-D	0.2	mg/L
Fluoride	Quarterly	Grab	SM 4500 F-C	1	mg/L
Chloride	Quarterly	Grab	325.2/4500-CLE	1	mg/L
Cations					
Sodium	Quarterly	Grab	EPA-6010B	0.5	mg/L
Calcium	Quarterly	Grab	EPA-6010B	0.5	mg/L
Potassium	Quarterly	Grab	EPA-6010B	0.5	mg/L
Magnesium	Quarterly	Grab	EPA-6010B	0.5	mg/L
Other					
Hardness (calculated) as CaCO3	Quarterly	Grab	SM2340B	NA	mg/L
Metals					
Aluminum	Annual	Grab	EPA-6010B	50	ug/L
Antimony	Annual	Grab	EPA-6020	2	ug/L
Arsenic	Quarterly	Grab	EPA-6020	2	ug/L
Barium	Annual	Grab	EPA-6020	20	ug/L
Beryllium	Annual	Grab	EPA-6020	1	ug/L
Boron	Annual	Grab	EPA-6010B	100	ug/L
Cadium	Annual	Grab	EPA-6020	0.5	ug/L
Chromium	Annual	Grab	EPA-6020	5	ug/L
Cobalt	Annual	Grab	EPA-6010B	10	ug/L
Copper	Quarterly	Grab	EPA-6020	4	ug/L
Iron	Quarterly	Grab	EPA-6010B	200	ug/L
Lead	Quarterly	Grab	EPA-6020	1	ug/L
Lithium	Annual	Grab	EPA-6010B	8	ug/L
Manganese	Quarterly	Grab	EPA-6020	20	ug/L
Mercury	Quarterly	Grab	EPA-1631E	0.0005	ug/L
Molybdenum	Annual	Grab	EPA-6020	10	ug/L
Nickel	Quarterly	Grab	EPA-6020	20	ug/L
Selenium	Annual	Grab	EPA-6020	1	ug/L
Silver	Annual	Grab	EPA-6020	0.2	ug/L
Thallium	Annual	Grab	EPA-200.8/6020	2	ug/L
Vanadium	Annual	Grab	EPA-200.8/6020	4	ug/L
Zinc	Quarterly	Grab	EPA-6020	10	ug/L

Table 9
Humboldt Mill - Mine Permit Surface Water Monitoring
Parameters, Frequency of Analysis, Analytical Methods, and Laboratory Reporting Limits

Parameter	Frequency of Analysis	Sample Type	Analytical Method	Laboratory Reporting Limit	Units
Field					
Flow	Quarterly	Grab	Field	NA	cfs
Temperature	Quarterly	Grab	Field	NA	°C
Dissolved Oxygen	Quarterly	Grab	Field	NA	mg/L
Specific Conductance	Quarterly	Grab	Field	NA	µmhos/cm
pH	Quarterly	Grab	Field	NA	S.U.
Turbidity	Quarterly	Grab	Field	NA	NTU
Metals					
Aluminum	Quarterly	Grab	EPA 6010	50	µg/l
Antimony	Quarterly	Grab	EPA 6020	2.0	µg/l
Arsenic	Quarterly	Grab	EPA 6020	1.0	µg/l
Barium	Quarterly	Grab	EPA 6020	10.0	µg/l
Beryllium	Quarterly	Grab	EPA 6020	1.0	µg/l
Boron	Quarterly	Grab	EPA 6020	50.0	µg/l
Cadmium	Quarterly	Grab	EPA-1638	0.01	µg/l
Chromium	Quarterly	Grab	EPA 6020	1.0	µg/l
Cobalt	Quarterly	Grab	EPA-1638	0.10	µg/l
Copper	Quarterly	Grab	EPA-1638	0.05	µg/l
Iron	Quarterly	Grab	EPA 6010	20.0	µg/l
Lead	Quarterly	Grab	EPA-1638	0.05	µg/l
Lithium	Quarterly	Grab	EPA 6010	10.0	µg/l
Manganese	Quarterly	Grab	EPA 6020	10.0	µg/l
Mercury (low level)	Quarterly	Grab	EPA-1631C	0.0005	µg/l
Molybdenum	Quarterly	Grab	EPA 6020	10.0	µg/l
Nickel	Quarterly	Grab	EPA-1638	0.20	µg/l
Selenium	Quarterly	Grab	EPA-1638	0.05	µg/l
Silver	Quarterly	Grab	EPA 6020	0.2	µg/l
Thallium	Quarterly	Grab	EPA 6020	2.0	µg/l
Vanadium	Quarterly	Grab	EPA 6020	2.0	µg/l
Zinc	Quarterly	Grab	EPA-1638	0.20	µg/l
Anions					
Alkalinity, Bicarbonate	Quarterly	Grab	310.2/SM 2320 B	2.0	mg/l
Alkalinity, Carbonate	Quarterly	Grab	310.2/SM 2320 B	2.0	mg/l
Chloride	Quarterly	Grab	325.2/4500-CLE	1.0	mg/l
Fluoride	Quarterly	Grab	SM 4500 F-C	0.1	mg/l
Nitrate	Quarterly	Grab	353.2/4500 NO3F	0.5	mg/l
Nitrite	Quarterly	Grab	354.1/4500 NO3F or 353.2	0.5	mg/l
Nitrogen, Ammonia	Quarterly	Grab	350.1/4500 NH3 G	0.5	mg/l
Sulfate	Quarterly	Grab	ASTMD516-90(02)	1.0	mg/l
Sulfide	Quarterly	Grab	376.1/4500 S2-D	5.0	mg/l
Cations					
Calcium (Total)	Quarterly	Grab	EPA-200.7/6010B	0.50	mg/l
Sodium (Total)	Quarterly	Grab	EPA-200.7/6010B	0.50	mg/l
Magnesium (Total)	Quarterly	Grab	EPA-200.7/6010B	0.50	mg/l
Potassium	Quarterly	Grab	EPA-200.7/6010B	0.50	mg/l
General Chemistry					
Hardness, (calculated) as CaCO3	Quarterly	Grab	Freeze and Cherry, 1979	NL	mg/l
Total Dissolved Solids	Quarterly	Grab	EPA-160.2/SM 2540 C	50.0	mg/l
Total Suspended Solids	Quarterly	Grab	EPA-160.2/SM 2540 D	1 / 3.3	mg/l

Table 10
Humboldt Mill - Mine Permit Sediment Monitoring
Parameters, Frequency of Analysis, Analytical Methods, and Laboratory Reporting Limits

Parameter	Frequency of Analysis	Sample Type	Analytical Method	Laboratory Reporting Limit	Units
Metals					
Aluminum	Quarterly	Grab	SW-846-6010	1.0 / 10	mg/Kg
Antimony	Quarterly	Grab	SW-846-6020	0.3	mg/Kg
Arsenic	Quarterly	Grab	SW-846-6020	0.1	mg/Kg
Barium	Quarterly	Grab	SW-846-6020	1.0	mg/Kg
Beryllium	Quarterly	Grab	SW-846-6020	0.5	mg/Kg
Boron	Quarterly	Grab	SW-846-6020	8.0	mg/Kg
Cadmium	Quarterly	Grab	SW-846-6020	0.2	mg/Kg
Chromium	Quarterly	Grab	SW-846-6020	2.0	mg/Kg
Copper	Quarterly	Grab	SW-846-6020	1.0	mg/Kg
Cobalt	Quarterly	Grab	SW-846-6020	0.5	mg/Kg
Iron	Quarterly	Grab	SW-846-6010	5.0	mg/Kg
Lead	Quarterly	Grab	SW-846-6020	1.0	mg/Kg
Lithium	Quarterly	Grab	SW-846-6020	0.15 / 1	mg/Kg
Manganese	Quarterly	Grab	SW-846-6020	1.0	mg/Kg
Magnesium	Quarterly	Grab	SW-846-6020	1.0 / 50	mg/Kg
Molybdenum	Quarterly	Grab	SW-846-6020	1.0	mg/Kg
Nickel	Quarterly	Grab	SW-846-6020	1.0	mg/Kg
Selenium	Quarterly	Grab	SW-846-6020	0.2	mg/Kg
Silver	Quarterly	Grab	SW-846-6020	0.1	mg/Kg
Zinc	Quarterly	Grab	SW-846-6020	1.0	mg/Kg
Mercury	Quarterly	Grab	SW-846-7471A	0.05	mg/Kg
Thallium	Quarterly	Grab	SW-846-6020	0.5	mg/Kg
Vanadium	Quarterly	Grab	SW-846-6020	1.0	mg/Kg
Sulfide	Quarterly	Grab	SW-846 9034	1.0 / 10	mg/Kg

Table 11
Humboldt Mill - NPDES Permit Water Treatment Plant Effluent Monitoring
Parameters, Frequency of Analysis, Analytical Methods, and Laboratory Reporting Limits

WTP Effluent	Frequency of Analysis	Sample Type	Analytical Methods	Laboratory Reporting Limit	Units
Field					
Dissolved Oxygen	Daily	Grab	Field	NA	mg/l
pH	Daily	Grab	Field	NA	S.U.
Outfall Observation	Daily	Grab	Field	NA	NA
Other					
Total Suspended Solids	Weekly	Grab	2540D	NA	mg/L
Total Dissolved Solids	Weekly	Grab	2540C	NA	mg/L
Biochemical Oxygen Demand (BOD)	2 x Month	Grab	5210B	NA	mg/l
Acute Toxicity	Monthly	Grab		NA	TU _A
Chronic Toxicity	Monthly	Grab		NA	TU _C
Anions					
Ammonia Nitrogen	2 x Month	Grab	4500-NH3 G	0.05	mg/l
Total Phosphorus	Weekly	Grab	4500-P E	0.01	mg/l
Fluoride	2 x Month	Grab	4500-F C	100	ug/l
Sulfate	Weekly	Grab	ASTMD516-90(02)	5	mg/l
Metals					
Total Antimony	2 x Month	Grab	200.7/200.8	1.0	ug/l
Total Arsenic	Weekly	Grab	200.7/200.8	1.0	ug/l
Total Barium	2 x Month	Grab	200.7/200.8	5.0	ug/l
Total Boron	2 x Month	Grab	200.7/200.8	20.0	ug/l
Total Cadmium	Weekly	Grab	200.7/200.8	0.2	ug/l
Total Chromium	2 x Month	Grab	200.7/200.8	1.0	ug/l
Total Cobalt	Weekly	Grab	200.7/200.8	15.0	ug/l
Total Copper	Weekly	Grab	200.7/200.8	1.0	ug/l
Total Lead	Weekly	Grab	200.7/200.8	1.0	ug/l
Total Lithium	2 x Month	Grab	200.7/200.8	8.0	ug/l
Total Manganese	Weekly	Grab	200.7/200.8	5.0	ug/l
Total Mercury	Weekly	Grab	1631E	0.5	ng/L
Total Molybdenum	2 x Month	Grab	200.7/200.8	25.0	ug/l
Total Nickel	Weekly	Grab	200.7/200.8	2.0	ug/l
Total Selenium	Weekly	Grab	200.7/200.8	1.0	ug/l
Total Strontium	2 x Month	Grab	200.7/200.8	5.0	ug/l
Total Zinc	Weekly	Grab	200.7/200.8	10.0	ug/l

Table 12
Powell Township Air Station – Air Metals Monitoring
Parameters, Analytical Methods, and Laboratory Reporting Limits

Eastern Research Group
601 Keystone Park Drive
Suite 700
Morrisville, NC 27560



2013 Metals MDL - Compendium Method IO-3.5

Element	47 mm Teflon		8x10" Quartz	
	ng/filter	ng/m3 (assuming 24.04m3)	ng/filter	ng/m3 (assuming 2000 m3)
Aluminum	1481	61.6	41816	20.9
Antimony	1.14	0.048	30.0	0.015
Arsenic	4.77	0.198	140	0.070
Barium	3.14	0.130	5839	2.92
Beryllium	0.374	0.016	5.17	0.003
Cadmium	0.340	0.014	19.4	0.010
Calcium	2539	106	394287	197
Chromium	408	17.0	4912	2.46
Cobalt	0.560	0.023	31.4	0.016
Copper	10.2	0.424	2866	1.43
Iron	376	15.6	33496	16.7
Lead	2.44	0.102	241	0.121
Magnesium	193	8.05	79243	39.6
Manganese	3.25	0.135	260	0.130
Mercury	0.60	0.025	8.91	0.004
Molybdenum	2.44	0.102	278	0.139
Nickel	6.01	0.250	2481	1.24
Rubidium	0.241	0.010	22.4	0.011
Selenium	7.27	0.302	54.9	0.027
Strontium	2.02	0.084	475	0.238
Thallium	0.036	0.001	0.867	0.0004
Thorium	0.354	0.015	3.79	0.002
Uranium	0.020	0.001	11.6	0.006
Zinc	222	9.25	14372	7.19

2013 Hexavalent Chromium MDL - ASTM D7614

Element	ng/filter	ng/m3 (assuming 21.6 m3)
Hexavalent Chromium	0.0083	0.00384

Table 13
Transportation Route - Surface Water Quality Monitoring
Parameters, Frequency, Analytical Method and Laboratory Reporting Limits

Parameters	Frequency	Analytical Method ¹	Laboratory Reporting Limit	Units
Field				
Temperature	Quarterly	Field	na	°C
Dissolved Oxygen	Quarterly	Field	na	mg/L
pH	Quarterly	Field	na	SU
Specific Conductance	Quarterly	Field	na	umhos/cm
Flow	Quarterly	Field	na	cfs
Anions				
Alkalinity, Bicarbonate	Annual	310.1/SM 2320 B	2.0	mg/L
Alkalinity Carbonate	Annual	310.1/SM 2320 B	2.0	mg/L
Chloride	Annual	EPA-325.2/4599-CL E	1.0	mg/L
Flouride	Annual	SM 4500 F-C	0.10	mg/L
Nitrate Nitrogen	Annual	EPA-353.2/4500 NO3F	0.050	mg/L
Sulfate	Quarterly	EPA-375.4/9038	1.0	mg/L
Cations				
Calcium	Annual	EPA-200.7/6010B	0.50	mg/L
Potassium	Annual	EPA-200.7/6010B	0.50	mg/L
Magnesium	Annual	EPA-200.7/6010B	0.50	mg/L
Sodium	Annual	EPA-200.7/6010B	0.50	mg/L
Total Dissolved Solids	Quarterly	EPA-160.1	50	mg/L
Metals				
Aluminum	Annual	EPA-200.7/6010B	50	ug/L
Lithium	Annual	EPA-200.7/6010B	10	ug/L
Antimony	Annual	EPA-200.8/6020	2.0	ug/L
Arsenic	Quarterly	EPA-200.8/6020	1.0	ug/L
Barium	Annual	EPA-200.8/6020	10	ug/L
Iron	Quarterly	EPA-200.7/6010B	20	ug/L
Beryllium	Annual	EPA-200.8/6020	1.0	ug/L
Boron	Quarterly	EPA-200.8/6020	50	ug/L
Cadium	Annual	EPA-200.8/6020	0.20	ug/L
Chromium	Annual	EPA-200.8/6020	1.0	ug/L
Copper	Quarterly	EPA-200.8/6020	1.0	ug/L
Cobalt	Quarterly	EPA-200.8/6020	10	ug/L
Lead	Annual	EPA-200.8/6020	1.0	ug/L
Manganese	Quarterly	EPA-200.8/6020	10	ug/L
Molybdenum	Annual	EPA-200.8/6020	10	ug/L
Nickel	Quarterly	EPA-200.8/6020	1.0	ug/L
Selenium	Quarterly	EPA-200.8/6020	2.0	ug/L
Silver	Annual	EPA-200.8/6020	0.20	ug/L
Zinc	Quarterly	EPA-200.8/6020	10	ug/L
Mercury ¹	Quarterly	EPA-1631E	0.00025	ug/L

¹ Acceptable by MDEQ to use 0.005 ug/L as reporting limit for mercury.