Report

Amended Contingency Plan

Back Forty Project

Project I.D.: 17A021

Aquila Resources Inc.
Stephenson, Michigan

March 2019

AQUILA RESOURCES

Foth

Amended Contingency Plan
Back Forty Project

Project ID: 17A021

Prepared for

Aquila Resources Inc.

Stephenson, Michigan

Prepared by

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List of Abbreviations, Acronyms, Symbols

Aquila	Aquila Resources Inc.
BMP	Best Management Practices
CMP	Cyanide Management Plan
CWB	Contact Water Basin
E-OSA	East Ore Storage Area
EM	Environmental Manager
Foth	Foth Infrastructure & Environment, LLC
IC	Incident Commander
ICS	Incident Command System
L	liter
LLCS	Leachate and Leak Collection Systems
LP	propane
m	meter
MDEQ	Michigan Department of Environmental Quality
MDNR	Michigan Department of Natural Resources
MDOT	Michigan Department of Transportation
MPA	Mining Permit Application
MPAA	Mining Permit Amendment Application
MSHA	Mine Safety and Health Administration
NWRF	North Waste Rock Facility
OMS	Operations, Maintenance, and Surveillance
OSA	Ore Storage Area
PIPP	Pollution Incident Prevention Plan
PMP	Probable Maximum Precipitation
Project	Back Forty Project
SDS	Safety Data Sheets
SPCC Plan	Spill Prevention, Control, and Countermeasure Plan
SWRF	South Waste Rock Facility
TMF	Tailings Management Facility
USGS	United States Geological Survey
W-OSA	West Ore Storage Area
WRF	Waste Rock Facilities
WWTP	wastewater treatment plant

1 Introduction (R 425.205)

This Amended Contingency Plan has been prepared for the Aquila Resources Inc. (Aquila) Back Forty Project (Project). In accordance with Michigan's Nonferrous Metallic Mining Regulations – Part 632 R 425.205, a Mining Permit Application (MPA) shall contain a Contingency Plan which will include an assessment of the risk to the environment or public health and safety resulting from the mining action.

A contingency plan was provided in the MPA (Foth, 2015a), and in 2016, Aquila received Mining Permit MP 01 2016 (Permit). The Project has been further optimized since the Permit was issued and an amended Permit is being sought. This Amended Contingency Plan addresses contingencies based on the optimized project configuration as listed in Section 8 of the Mining Permit Amendment Application (MPAA) (Foth, 2018a). This Amended Contingency Plan is intended to expand on contingency information provided in the MPAA as requested in the Michigan Department of Environmental Quality's (MDEQ) Request for Additional Information letter dated February 15, 2019 (MDEQ, 2019).

2 Contingency Items and Response Measures (205 (1)(a))

This plan describes risks associated with mining operations and the response measures that could be implemented should a failure occur. In addition, a description of the design features which mitigate potential risks are also noted.

2.1 Toxic and/or Acid-Forming Materials (205 (1)(a)(i))

Potentially reactive materials generated as a result of mining operations include the ore, waste rock, and tailings. A description of this material is provided in the MPAA (Foth, 2018a). These materials have the potential to leach mining-related constituents when exposed to air and water. As described in the following subsections, handling and storage of the waste rock, ore, and tailings have been carefully considered in the design of the Project to prevent the release of constituents to the environment. Prior to mine operations, Aquila will prepare spill procedures and plans including the following:

- Pollution Incident Prevention Plan (PIPP)
- Spill Prevention, Control, and Countermeasure Plan (SPCC Plan).
- Cyanide Management Plan (CMP).

These plans will describe in detail prevention and containment of hazardous materials including reagents, chemicals, ore, waste rock, and tailings. This section focuses on the potentially reactive ore, waste rock, and tailings, with the remaining hazardous materials addressed in Section 2.7.

The following is a list of Project facilities proposed to store potentially reactive materials and/or contact water generated as a result of mining operations:

- Tailings Management Facility (TMF): A permanent double-lined facility containing flotation and oxide tailings contained by a perimeter waste rock berm.

- North Waste Rock Facility (NWRF): A double-lined temporary waste rock facility adjacent to the TMF that is backfilled to the mine pit at closure.

- South Waste Rock Facility (SWRF): A double-lined temporary waste rock facility south of mine pit that is backfilled to the mine pit at closure.

- The NWRF and SWRF are noted together as the Waste Rock Facilities (WRF).

- Leachate and Leak Collection Systems (LLCS) and Ditches: Double-lined ponds and ditches that collect drainage water from the TMF and WRF.

- East Ore Storage Area (E-OSA): Composite-lined area containing five ore stockpiles, equipped with double-lined leachate collection sumps with leak detection.

- West Ore Storage Area (W-OSA): Composite-lined area containing two ore stockpiles, equipped with double-lined leachate collection sumps with leak detection.

The locations of these facilities are shown on Figure 2-1.

2.1.1 Tailings Management Facility and Waste Rock Facilities

As the result of ore processing, flotation and oxide tailings will be generated, thickened, and pumped the TMF. The tailings are potentially acid generating based on geochemical test work described in the MPA (Foth, 2015a). Waste rock will also be generated and be stored in the SWRF and NWRF.

Assessment of Risk

There is a potential for leachate or contact water generated from the tailings and waste rock that are stored in the engineered facilities to affect the surrounding environment in the following manners:

- Liner failure affecting surrounding groundwater quality.
- Failure of leak detection system affecting quality of groundwater.
- Overtopping of the perimeter ditches and collections sumps affecting quality of surrounding surface water.
- Stability failure of the TMF berms affecting quality of surrounding surface water.

Release of leachate or contact water to the environment could pose a threat to wildlife in and near the Project Area by impacting surface water and/or groundwater quality. The Project Area is located in a remote, sparsely populated area; therefore, an unlikely release of contact water to the environment would have minimal affect to local residents.

Mitigation of Risks

The design of the TMF and WRF provided in Appendix C of the MPAA (Foth, 2018a) has employed technologies that can effectively store and manage tailings, waste rock, and contact water, thereby reducing its risk of exposure to the environment or affect to public health. These technologies include:

- Engineered Double Liner System:
  - Includes associated leachate collection system and leak detection system to mitigate the risk of failure of the primary upper liner.
- Non-segregating thickened (dewatered) tailings:
  - The higher density slurry forms a stable mass upon deposition, thereby mitigating risk of stability failure of TMF.
  - Tailings processing removes water from tailings prior to deposition at the TMF, reducing the quantity of water to be managed within the TMF. This mitigates the risks of perimeter ditches or collection sumps overtopping as well as stability failure of the TMF.

- Moisture is retained for greater chemical stability and reduced potential for acidic leachate generation. This mitigates the risks associated with the presence of acid leachate in the TMF decant area, on the liner, in the perimeter ditches or collection sumps.
- Expeditious reclamation/covering of tailing beaches promotes drainage of non-contact storm water to the perimeter of TMF (via non-contact stormwater pond). This assists in maintaining the integrity of the structure and cover.

- Emergency Spillway:
  - A designed flow channel will convey contact water from the TMF decant area to the mine pit in the event of an extreme storm event, thereby mitigate the risk of stability TMF failure (and eliminating the risk of TMF berm overtopping).
  - The spillway is designed to safely convey the 24-hour, Probable Maximum Precipitation (PMP) event. The TMF decant area has been designed to safely contain storms as extreme as the 24-hour, 100-year event (more extreme events will trigger the emergency spillway and be conveyed to the mine pit).

- TMF Leachate Water Quality Modeling and Monitoring:
  - Geochemical data will continue to be analyzed and leachate qualities modeled to ensure a neutral pH will be maintained on the TMF liner throughout the mine life. This mitigates risks associated with acidic leachate existing on the liner, or in the perimeter ditches or collection sumps.
  - Geochemical monitoring during operations will be performed to confirm neutral pH on liner is maintained, thereby mitigating risks associated with acidic leachate existing on the liner, in the perimeter ditches, or collection sumps.
  - Modeling (and experience at the Eagle Mine among other projects) suggests that limestone amendment to the final stage of the TMF waste rock berms would be effective at controlling the pH of the leachate and maintaining a neutral pH on the liner. When the TMF reaches its full buildout during the final years of mine operations, the quantity of waste rock available to emit constituents to the leachate (seepage water) is greatest.

The WRF will be amended with limestone as an additional contingency measure to off-set the potential generation of acidic leachate. Additionally, all contact water will be collected via the lining and leachate collection systems, to be used or treated prior to discharge.

The locations of the TMF and WRF were selected with the goal of minimizing impacts to the environment. The following are some of the boundary and site criteria that govern the selection of the facility locations:

- The TMF and WRF will be located above the 100-year floodplain, mitigating the risk of flooding those structures.

- The mine pit will be located between the waste structures (TMF and WRF) and the Menominee River, mitigating the risk of contact water reaching the river.

Risk Response Measures
An Operations, Maintenance, and Surveillance (OMS) Manual will be prepared by the final design engineer for the TMF. The OMS describes monitoring of the TMF, its leachate collection system, leak detection system, perimeter berm slopes, perimeter ditches, and collection sumps. The OMS Manual will also outline planning and response measures for the final design of the TMF and its components.

In the unlikely event that contact water is released to the environment, Aquila will notify the MDEQ in accordance with the Permit and implement emergency spill response.

2.1.2 Contact Water Basin

Per R 425.203(c)(xxi) of the state of Michigan's Nonferrous Metallic Mining Regulations (Part 632), storm water runoff and leachates from ore, waste rock, overburden, and tailings determined to be reactive under R 425.203(c)(v) must be contained and treated. Contact areas at the Project include the pit, the TMF, the WRF, the process area, and roads connecting these areas. Runoff from these areas will be collected in the contact water basin (CWB) for storage, use in the mill, or treatment at the wastewater treatment plant (WWTP) prior to discharge. The CWB is designed to manage a 100-year rainfall event.

Assessment of Risks
There is a very low potential for contact water to reach the environment from the CWB. Release of contact water from the CWB could result from:

- Basin liner failure causing contact water to reach groundwater.
- Failure of the CWB pumping system causing contact water to reach the ground surface.
- Inundation due to flooding causing contact water to reach the ground surface.

The unlikely release of contact water to the environment could pose a slight risk to wildlife in and near the Project Area by impacting surface water and/or groundwater quality.

Mitigation of Risks
The CWB has been designed with the following engineering controls to contain and separate contact water from the public and environment. The engineering controls include the following:

- A composite liner system will mitigate the risk of contact water from impacting groundwater.

- Freeboard to prevent contact water from reaching the ground surface.

- A spillway from the CWB to the pit to prevent contact water from entering the environment.

Risk Response Measures
In the unlikely event that a runoff event exceeds capacity of the CWB, excess water will be routed via the spillway to into the mine pit. This is a passive control that fully reduces the risk that contact water from the CWB will enter the environment.

2.1.3 East and West Ore Storage Areas

The ore will be loaded in the mine pit onto off-road trucks which will transport the ore to the either the E-OSA or W-OSA. Blending and ore management will take place at the ore storage areas (OSA).

Assessment of Risks
Risks associated with the OSAs include:

- Dumping ore beyond the limits of the OSAs.
- Major precipitation event that causes contact water to overtop the collection system.
- Breach of the pad collection sump resulting in contact water release to subsoils.
- Mechanical failure of pumps of pipelines resulting in contact water release to noncontact areas.

Mitigation of Risks
Mine haul road design and construction will follow all applicable Mining Safety and Health Administration (MSHA) regulations for roadway slope grade, berm heights, and allowable vehicle speeds. The design of the OSAs addresses both contact water runoff, water from the stockpiles, and potential dust emissions.

The design provisions incorporated into the OSA that mitigate environmental risk include:

- A lined pad with a leachate collection sump will collect contact water associated with the ore. Contact water collected in the sump will be pumped into the CWB where it is stored prior to use or treatment.
- A leak detection system will be installed beneath each OSA sump.

Risk Response Measures
Any spilled coarse ore will be relatively easy to pick up with conventional earthmoving equipment, brooms, and shovels and placed back into a truck. If such an event should occur, removal action will take place as soon as possible. Although geochemical testing of the ore has shown that potential acidic conditions will not occur in this short time period, it will be important to respond appropriately to any spills. The PIPP will include regular inspection, maintenance, and spill response actions for ore stored at the OSAs.

If an accident results in ore spillage into an on-site water basin, specialized equipment such as temporary dams/cofferdams and large backhoes may be required to isolate the ore and remove the ore from the water.

2.1.4 Mine Open Pit

The open pit was designed in accordance with the best engineering practices and all appropriate Federal and State rules and regulations. The topographical surface area is shown on Figure 2-1. The maximum pit depth is approximately 227 meters (m) below the pit rim.

Assessment of Risks

There is a potential for contact water reaching the environment from contact water from the pit to reach the ground surface and/or the Menominee River. Contact water release to the environment from the pit could be the result of:

- Sideslope failure causing contact water to reach the ground surface and/or the Menominee River.
- Inundation of the pit due to flooding, excessive seepage from the pit wall, or pump failure causing diluted contact water to reach the ground surface and/or the river.
- Haul road failure causing contact water to reach the ground surface or the river.

Release of contact water to the environment could pose a threat to wildlife in and near the Project Area by impacting surface water and/or groundwater quality. The Project Area is located in a remote, sparsely populated area, but a release of contact water could potentially impact residents in the immediate vicinity of the Project Area by impacting surface water and/or groundwater quality.

Mitigation of Risks

To mitigate risks associated with the open mine operation, the mine design incorporated the following parameters:

- A 50 m offset from the river to provide contingency for open pit seepage to/from the Menominee River.
- Minimize ramps in the north high wall to provide contingency to the mine design stripping ratio by avoiding the steeper wall section of the pit.
- Place a double lane ramp to the 64 m level and then convert to a single lane ramp to the pit bottom to provide contingency to the mine plan by minimizing excessive waste stripping or loss of recoverable resource.
- Incorporate pit wall berms and batter angles based on defined geotechnical zones coded in the block model.

Risk Response Measures
Conduct daily monitoring of active mine pit walls to document any potential slumping of the rock pit wall. Inspections will be completed and documented as per MSHA regulations. Inspections will be completed after each blasting event to assure stability of the area prior to ore removal. In addition, groundwater infiltrating into the mine area will be pumped into the CWB for storage and treatment.

2.2 Storage and Handling of Explosives and Mine Blast Plan (205 (1)(a)(ii))

This section describes contingency related to the storage and handling of explosives and blasting activities.

2.2.1 Storage and Handling of Explosives

Blasting operations will be managed by Aquila. Figure 2-1 shows the location of explosives storage extending south from the E-OSA. All explosive and blasting materials required for pit development and ore production will be managed by trained and licensed Aquila personnel in accordance with formal protocols.

2.2.1.1 Blasting Activities

To free waste rock and ore material in the pit, blasting will be conducted on a schedule established by Aquila. Currently, Aquila is estimating a blast every two to three days during normal production.

Assessment of Risks
Risks associated with the blasting activities include:

- Potential for fly rock leaving the pit area, which could cause injury to people or animals in the vicinity of the pit during blasting.
- Ground seismic vibrations, which could cause ground shaking in the vicinity of the pit.
- Air blast during a blasting event, which could startle people or animals in the vicinity of the pit and potentially effect flat surfaces such as windows.
- Damage to the structural integrity of the cut-off wall during blasting operations along the west side of the pit, which could cause failure and release of materials to the Menominee River.
- Unplanned or accidental blasting outside the planned blasting zone or poorly implemented blasting activity within the blasting zone that places staff, the environment, or the public at risk.

Mitigation of Risks
- A blasting plan will be prepared as required by the Michigan's Blasting regulations and MSHA requirements. The blasting plan will address design parameters such as burden,

spacing, stemming depth, blast movement direction, powder factor, and powder loading per delay and how those values may be altered to aid mitigation. A responsible, credentialed blasting engineer will plan and supervise all blasting activities.

- Blast mats and other appropriate industrial standard measures will be deployed to prevent fly rock exiting the blast area during a blasting event.

- Seismographs will be installed and monitored in areas identified as vulnerable to blast vibrations in accordance with MSHA, Michigan's blasting regulations, and the Blast Management Plan.

- The cut-off wall integrity will be monitored before and after every blasting event in accordance with the Mining Permit.

- The blasting agents, primers and caps/initiation systems will be delivered to the site in amounts to serve a small number of blasts. Explosives will be purchased from approved, accredited vendors and delivered in Department of Transportation-approved over-the-road truck. Any blasting agents, primers and caps/initiation systems not used during a blast event will be immediately transported to the explosives storage.

- The explosives storage is a designed repository specifically suited to storing and securing explosives and associated equipment. The storage facility will be locked and monitored at all times other than during supervised transfer of explosive materials.

- Only trained personnel will handle explosives and supporting blasting materials.

- Vehicular and pedestrian traffic on River Road and in the vicinity of the pit will be halted for the short duration needed prior to and during blast activities.
- Permanent signage will be installed in the pit vicinity to warn the public of potential blasting activities.

- 24-hour notification to residents within a ¼ mile of mine, the public, and regulatory agencies will be provided.

- A distinctive air horn blast will sound 3 minutes prior to a blast.

Risk Response Measures

Response measures for blasting related incidents will be addressed in the Blast Management Plan, the overall mine safety and response plan, and in accordance with the Mining Permit and MSHA requirements. Emergency evacuation procedures addressing all emergency incidents will be in place and clearly communicated to staff and visitors. Notifications to local emergency personnel and organizations as well as agency notifications will be implemented as necessary and required.

2.3 Fuel Storage and Distribution (205 (1)(a)(iii))

Fuel for haul trucks, light vehicle fleet, and ancillary facilities will be dispensed from above-grade diesel fuel and gasoline storage tanks located near the plant near the truck shop (Figure 2-1). The tank farm will be constructed with secondary containment to house one 114,000 liter (L) diesel tank and one 4,000 L gasoline tank. The fuel tanks will provide sufficient storage for up to 10 days of operation. The fuel storage system will include loading and dispensing equipment that conforms to regulations and will be located in a contained area to control fuel spillage. A dedicated fuel service truck will transport diesel fuel to the mining equipment.

A 14-day supply of propane will also be included for heating of buildings. A 7,500 L (2,000 pound) propane (LP) tank will be located in the general mill area. Other propane tanks may be positioned near the administrative building, truck shop, and WWTP. Storage of propane does not require secondary containment since any leakage vaporizes and does not have the potential to contaminate surface or groundwater.

All fuels will be transported to the Project by tanker truck from local petroleum distributors. The probability of an accidental release during transportation depends on the location of the supplier(s) and the frequency of shipment. A fuel release resulting from a vehicular accident during transportation is judged to be a low-probability event. Fuel transport in tanker trucks does not pose an unusual risk to the region since tanker trucks currently travel throughout the region regularly to deliver a variety of fuels to the communities surrounding the Project.

Assessment of Risks

Three potential release events associated with the fuels are a bulk tank failure, mishandling/ leaking hoses, and a construction/reclamation phase release.

Bulk Tank Failure – A tank failure could potentially result from unusual thermal, mechanical, or chemical stresses. Chemical stresses are not anticipated as the storage tanks will be designed, constructed, and installed with materials compatible with the fuels. Mechanical stress is also not anticipated since the tanks will be located within a containment area offering protection from vehicles. Contingency measures required to mitigate a fuel spill will be provided in the PIPP/SPCC Plan to be developed prior to construction. The PIPP/SPCC Plan will include regular inspection and tank integrity testing to verify that the storage tanks and containment are adequate for service.

Mishandling/Leaking Hoses – A release might result from leaking hoses or valves or from operator mishandling. This type of release is likely to be small in volume and is judged to be a low probability event given that operators will be trained to manage these types of potential releases. These small spills will be cleaned up by using on-site spill response equipment such as absorbent materials and/or removing impacted soils.

Construction/Reclamation Phase Release – A major fuel spill during the construction or reclamation phases could occur from a mobile storage tank failure or mishandling of fuels. Such a release is considered to be a low probability event given that operators will be trained to manage these types of potential releases.

Mitigation of Risks
In general, fuel spills and leaks will be minimized by the following measures:

- All primary storage vessels will be of new construction and designed and constructed/installed in accordance with industry standards and practices.
- Adequate secondary containment provided for aboveground bulk storage tanks, oil product containers, and fuel and oil product transfer areas.
- Training of personnel responsible for handling fuel and oil products in proper procedures and emergency response.
- Regular equipment inspections of tanks, hoses, valves, nozzles, etc. and documentation of findings.
- On-site emergency response protocols and equipment to quickly respond to unanticipated spills or leaks.

Risk Response Measures
Specific procedures will be prepared as part of the facility's SPCC Plan. The SPCC Plan will be complement the PIPP. The Plan will address fuel transfer operations, tank overfill prevention, tank and container inspection, personnel training, and cleanup and reporting procedures. Plan implementation greatly reduces the risk that fuel will migrate off-site by a spill.

Absorptive materials may be used initially to contain a potential spill. After the initial response, soil impacted with residual fuel would be addressed. Remedial efforts could include, if necessary, the removal of soil to preclude migration of fuel to groundwater or surface water. The Project's PIPP/SPCC Plan will address fueling operations, fuel spill prevention measures, inspections, training, security, spill reporting, and equipment needs. All responses to a fuel spill, both large and small, will follow the plan procedures and regulatory requirements.

2.4 Fires (205 (1)(a)(iv))

This section discusses contingency measures to be taken in the event of either mine pit fire or surface facility fire.

2.4.1 Mine Pit Fire

Assessment of Risk
In the event that a mine fire develops, it would be expected to be localized and short lived. Locations on the west side of the pit, when the pit is shallow during initial mining, pose the greatest risk to the public who may be traveling on River Road.

Mitigation of Risks
Combustible materials are limited in the mining operation, primarily mobile equipment and fuel. Electrical fires in motors or electrical processing equipment is possible. As mentioned, these

potential sources are localized and will be contained in the pit area. Contingency measures include having the required safety equipment, appropriate personnel training, and standard operating procedures in firefighting procedures.

Risk Response Measures
In the event of any pit fire, River Road will be blocked at locations as soon as possible to reduce public access. Besides vehicle fuel tanks, there will be very little, if any, flammable and combustible material in the pit. Smoking will be allowed in designated areas only and not areas of mining operations. Pit fires are considered very unlikely.

2.4.2 Surface Area Fire

Assessment of Risk
Surface fires can be started by a variety of causes including vehicular accidents, accidental ignition of fuels or flammable chemical reagents, and lightning strikes. Smoking will only be allowed in designated areas on the site.

Mitigation of Risks
Contingency measures include having the required safety equipment, appropriate personnel training, and standard operating procedures. The surface facility will be provided with a firewater tank and diesel driven firewater pump (Figure 2-1). The tank is a combination freshwater and firewater tank, but designed with a stand pipe protecting the firewater supply exclusively to be used only for fire suppression. Emergency generators will provide power to the fire system pumping and controls in the event fire occurs during a power outage.

Flammable materials on-site include miscellaneous flammable and combustible oils and reagents and the fuels (Section 2.3). Proper container design, secondary containment, safety programs and practices, and availability of fire suppression equipment all contribute to minimizing fire risks. Stringent safety standards and training will be implemented during construction and operation of surface facilities. During the construction and operations, a fire control vehicle will be stationed on-site and all construction equipment and vehicles will be equipped with fire extinguishers. If controlled burning is required following site clearing activities, a permit will be obtained from the Michigan Department of Natural Resources (MDNR), which will specify measures to be taken for the prevention of unregulated fires.

Risk Response Measures
Emergency notification procedures as outlined in Section 3 will be followed. Given these measures, uncontrolled or large facility surface fires are considered a low probability event with low risk.

Because the Project is situated in a forested region, forest fires starting off-site could potentially impact the mine site. The cleared area in the vicinity of the surface facilities and excess soil berms will serve as a fire break to protect surface facilities. Notification measures discussed in Section 3 will be implemented in the event an off-site forest fire threatens the facility.

2.5 Wastewater Treatment System (205 (1)(a)(v))

Contact water collected from the mine pit, TMF, WRF, and contact areas will be routed to the CWB. Excess water in the CWB will be treated at the WWTP, and discharged to the Menomonee River. The CWB risk assessment was presented in Section 2.1.2. Risk assessment and mitigation regarding WWTP operation is presented in this section. The location of the WWTP is shown on Figure 2-1.

Assessment of Risk
The WWTP will be designed to handle various process upset conditions such as power disruption and maintenance of various process units. The two risks associated with the WWTP are:

- Equipment malfunction.
- An inundation of contact water within the CWB that exceeds the capacity of the WWTP.

Mitigation of Risks
The wastewater effluent will be monitored for key indicator parameters to verify the proper operation. Effluent not meeting treatment requirements will be pumped back to the CWB for re-treatment. Should water be unsuitable for discharge for an extended period, the CWB is sized and managed to accommodate prudent amount of water storage to allow resolution of process issues.

Should the CWB storage capacity be exceeded, the spillway to the mine pit (described in Section 2.1.2) will route excess water overflow. This minimizes the risk of contact water entering the environment.

Risk Response Measures
During operations, Aquila will maintain process monitoring and maintenance of WWTP, effluent monitoring, and water management to provide prudent storage availability to the CWB appropriate to the conditions.

2.6 Air Emissions (205 (1)(a)(vii))

Air emissions will be generated during the operation of the mine. The anticipated air emissions are detailed in the Project's air use permit (Foth, 2018b).

Assessment of Risk

- Uncontrolled emissions resulting from a failure of an emission control device in the ore processing building.

- Dust emissions resulting in vehicular traffic during periods of dry weather.

- Dust generated during a blast event.

Mitigation of Risk
All phases of the project will incorporate a combination of operating and work practices, maintenance practices, emission controls, and engineering design to minimize potential accidents or failures. The ore processing is equipped with dust control equipment. Excavated areas will be re-vegetated or covered. Areas that are disturbed by wind or excessive rainfall will have protective erosion mats installed and be re-vegetated as soon as possible. Temporary covers could also be used to protect soil stockpiles.

Risk Response Measures
Dust suppression for ore storage areas and vehicle roadways includes water spray and sweeping, where applicable. Dust generated during material handling activities can be addressed through water sprays applied as appropriate. Malfunctions of pollution control equipment will be addressed in a malfunction abatement program.

2.7 Hazardous Substance Spills (205 (1)(a)(viii))

Hazardous substances will be stored and utilized in the process, wastewater treatment, and maintenance of mobile equipment. The products range from fuel (addressed in Section 2.3) and process water management chemicals.

Assessment of Risk
Spillage or release of hazardous substances could occur during the delivery or during the transfer and/or usage of the product. Also, damage to the storage container from accident could cause leakage.

Mitigation of Risk
In general, spills and leaks will be minimized by the following measures:

- All primary storage vessels will be of new construction and designed and constructed/installed in accordance with industry standards and practices.
- Adequate secondary containment provided for chemical storage tanks, oil product containers, and fuel and oil product transfer areas.
- Personnel training for those responsible for handling products in proper procedures and emergency response.
- Regular equipment inspections of tanks, hoses, valves, nozzles, etc. and documentation of findings.
- On-site emergency response equipment to quickly respond to unanticipated spills or leaks.

Risk Response Measures
Secondary containment for the chemical containers and other hazardous substances are provided for the maintenance and process products and chemicals stored and used on-site. Product usage

and storage management will follow the guidelines established in the CMP and PIPP/SPCC Plan required by the Permit and other standard management requirements.

2.8 Natural Risks (205 (1)(a)(ix))

2.9.1 Earthquakes

The Upper Peninsula of Michigan is in a seismically stable area. The United States Geological Survey (USGS) seismic impact zone maps show the maximum horizontal acceleration to be less than 0.1 grams in 250 years at 90% probability. The mine site is not located in a seismic impact zone and the risk of an earthquake is minimal. Therefore, under such low potential seismicity, engineering controls for earthquakes are not needed.

2.9.2 Floods

High precipitation events discussed in previous sections described the design of the CWB and the TMFs. The impacts of a flood would be localized erosion and possible siltation of on-site wetlands. Contingency measures to control erosion include sandbag sediment barriers and temporary diversion berms; riprapping eroded areas; installing erosion control blankets to temporary mitigate erosion; and the use of other soil and erosion control Best Management Practices (BMP). Failed erosion control structures would be repaired or rebuilt. Long term or off-site impacts would not be expected since runoff from disturbed areas is designed to flow to on-site sedimentation or detention ponds. Impacts from high precipitation are reversible and off-site impacts are not expected to occur. Given the considerable planning and engineering efforts to manage high precipitation events, the risk posed by high precipitation is considered negligible and easily addressed by ongoing BMPs.

2.9.3 Severe Thunderstorms or Tornadoes

Severe thunderstorms or tornadoes will be addressed in the emergency procedures to be developed for the Project. Certain buildings will be designated shelters in the event of severe weather. Evacuation procedures will be part of the on-site training of all employees.

2.9.4 Blizzard

The mine and the facilities will be designed to accommodate the winter conditions anticipated for the Upper Peninsula. The site access road will be designed to accommodate the truck transport of processed ore off-site. Therefore, it is anticipated that the mine will be accessible during the worst of winter weather. Aquila will work with the Menominee County and Lake Township on an arrangement for maintenance of the County and local roads during winter conditions. If road conditions deteriorate beyond the capability of the County maintenance equipment, Aquila will make arrangements to keep workers on-site for extended periods.

2.9 Power Disruption (205 (1)(a)(x))

Electrical power for the project will be provided by a new 138 kilovolt power transmission line to the site routed along the proposed site access road.

Assessment of Risk
Loss of electrical service power due to utility power outages or storm-related downed power distribution lines serving the mine facility is a potential risk.

Mitigation of Risks
Emergency power will be supplied by two back up diesel generators. In the case of a power outage, emergency and essential processes will be supported via the generators to maintain safety and essential operations. This includes equipment and controls for fire water systems and other emergency equipment, lighting and safety systems located in areas of personnel (Administration Building, Maintenance Shop, etc.) and control systems and equipment needed to maintain the safety and operations in the mine, mill, TMF, and WWTP operations.

In the event the WWTP temporarily shuts down during power disruptions, the CWB is designed to hold up mine pit inflow and leachate from the TMF.

Risk Response Measures
Aquila will work with the electrical utility company to provide vegetation maintenance within the electrical utility corridor to prevent the damage of the utility distribution lines from downed trees on property owned by Aquila.

2.10 Unplanned Subsidence (205 (1)(a)(xi))

The Project does not include an underground mine as such contingency planning for subsidence is not required.

2.11 Leaks from Containment Systems or Storage or Disposal Facilities (205 (1)(a)(xii)

This section will discuss contingency for containment systems, storage, and disposal facilities including pipelines. The following is a list of containment facilities and storage and disposal facilities from which leaks could potentially originate:

- TMF and WRF, referred to in previous section
- OSAs, referred to in previous sections
- Fuel storage facilities, referred to in previous sections
- Tailings and contact water pipelines
- Chemical storage facilities
- CWB

2.11.1 TMF and WRF

Assessment and mitigation of risks and risk response measures related to leaks from the TMF and WRF are discussed in Section 2.1.1.

2.11.2 Ore Storage Areas

Assessment and mitigation of risks and risk response measures related to leaks from the OSAs are discussed in Section 2.1.3.

2.11.3 Fuel Storage Facilities

Assessment and mitigation of risks and risk response measures related to leaks from the fuel storage facilities are discussed in Section 2.3.

2.11.4 Tailings and Contact Water Pipelines

Assessment of Risk
There is a potential for contact water reaching the environment from pipelines connected to the CWB and TMFs. Contact water from the pipelines could be the result of:

- Pipeline leakage causing contact water to reach the ground surface.
- Pipes freezing in winter causing contact water to reach the ground surface.
- Pipeline breaches by heavy equipment impacts causing contact water to reach the ground surface.

Release of contact water to the environment could pose a threat to wildlife in and near the Project Area by impacting surface water and/or groundwater quality. The Project Area is located in a remote, sparsely populated area, but a release of contact water could potentially impact residents in the immediate vicinity of the Project Area by impacting surface water and/or groundwater quality.

Mitigation of Risks
The pipelines are designed with spill control features and emergency dump ponds for spill containment. Pipe freezing will be prevented by installing insulation and/or heat tracing in locations evaluated to be vulnerable to freezing. In areas intersecting roadways or vehicle presence, protective barriers will be installed and maintained.

Risk Response Measures
Routine inspection and maintenance and the Environmental Monitoring Plan (MPAA, 2018) will be implemented that will include inspection, maintenance, repair, and monitoring of the tailings and contact water pipelines. In the event of pipeline failure, the failure should be detected by the leak detection systems before contact water reaches the environment. If contact water or tailings reach the environment, Aquila will notify the MDEQ and implement emergency spill response.

2.11.5 Chemical Storage Facilities

Assessment of Risk
There is potential for chemical reagents to reach the environment from the on-site chemical storage facilities by the following means:

- Chemical spillage to the ground.
- Fire or explosion in the chemical storage facility causing chemicals to reach the ground surface, surface water, groundwater, or air.

Chemical release to the environment could pose a threat to wildlife in and near the Project Area by impacting surface water and/or groundwater quality. The Project Area is located in a remote, sparsely populated area, but a release of chemicals could potentially impact residents in the immediate vicinity of the Project Area by impacting air, surface water, and groundwater quality.

Mitigation of Risks

Chemicals will be delivered to the site by certified chemical haulers, meeting Michigan Department of Transportation (MDOT) requirements. Chemical storage will be provided in secure locations within building(s) or outdoor bulk storage silos designed for that application. Transferring chemicals will be conducted by qualified site personnel. Bulk granular products will be conveyed pneumatically to the storage silos. Bulk liquids will unload from tanker trucks on pavement areas to allow for cleaning of any spilled material. Specific procedures will be prepared as part of the facility's PIPP. Safety Data Sheets (SDS) will be maintained on-site for all chemicals.

Cyanide is highly toxic and will be managed in accordance with a CMP and Permit requirements.

Risk Response Measures

Because chemicals will be stored in secure areas, the potential for release into the environment is very remote. If a breach of containment vessel does occur, the chemical will be contained within a secondary containment area. The spill or release will be immediately cleaned using appropriate methods specified Project management plans and the SDSs.

2.11.6 Contact Water Basin

This feature was discussed in Section 2.1.2.

3 Notification Procedure (205 (1)(b))

The notification procedures provided in the MPA (Foth, 2015a) in accordance with R205 (1)(b) remain unchanged, but are repeated herein for inclusion in the Amended Contingency Plan. In accordance with R 425.205(2), a copy of this Amended Contingency Plan is being provided to each Emergency Management Coordinator having jurisdiction over the affected area at the time the application is submitted to the MDEQ.

3.1 Procedures for Notifying General Public (205 (1)(b)(i))

The Public Relations Officer, as described below, is responsible for notifying the general public in emergency situations.

3.2 Emergency Notification Procedures (205 (1)(b)(ii))

An emergency will be defined as any unusual event or circumstance that endangers life, health, property, or the environment. Aquila will adopt an Incident Command System (ICS) structure to respond to such emergencies. The ICS structure allows key individuals to take immediate responsibility and control of the situation and ensures appropriate public authorities, safety agencies, and the general public are notified, depending on the nature of the emergency. A brief description of the ICS structure is as follows:

Incident Commander (IC): The General Manager at the facility will be designated the IC and will be responsible to ensure that emergency response actions are carried out in an appropriate and timely manner. The IC will ensure that appropriate resources are available, ensure the incident is secured, and release resources in an orderly manner. The IC will also ensure appropriate notification is made to all required regulatory agencies and necessary emergency response agencies.

Safety Officer: The facility safety officer and staff are responsible for ongoing review of ICS structures and will monitor activities in response to an emergency. During an emergency, the safety officer will manage special situations that expose responders to hazards, coordinate emergency response personnel, mine rescue teams, fire response, and ensure relevant emergency equipment is available for emergency service. This individual will also work with the IC to ensure appropriate personnel are made available to respond to the situation.

Environmental Manager (EM): The facility EM will be responsible for managing any environmental aspects of an emergency situation. This individual will coordinate with the IC to ensure environmental impact is minimized, determine the type of response that is needed and act as a liaison between environmental agencies and mine site personnel. The EM is also responsible for any notifications required to regulatory agency required by the Mining Permit, MDEQ, or federal law.

Public Relations Officer: The facility human relations manager will be responsible for managing all contacts with the public and will coordinate with the IC, the Safety Officer, and EM to provide appropriate information to the general public. This individual will also meet all arriving outside response agency personnel and pass on instructions from the IC. This individual will also immediately notify families of employees injured or affected.

3.3 Actions to Restrict Access (205 (1)(b)(iii))

The River Road is planned to be dead-ended on the west side of the pit as shown on Figure 2-1. Should further access be necessary to restrict, local authorities and jurisdictions will be contacted regarding the schedule and methods. Road restrictions will be facilitated by direct communications between the mine operators in charge of the blast or incident. Individuals will be positioned on the roadway in charge of the temporary road closure for as long as appropriate.

3.4 Evacuation Procedures (205 (1)(b)(iv))

The immediate surrounding area is sparsely populated. If necessary, the general public will be coordinated with emergency response agencies. The Aquila Public Relations Officer will be responsible for this notification, working with other site personnel, including the IC safety and environmental officers.

In the event evacuation of mine personnel is required, Aquila will have established emergency response procedures for the pit as well as surface faculties such as the TMF. All evacuation procedures will be developed in compliance with MSHA regulations.

3.5 Emergency Equipment (205 (1)(b)(v))

A list of emergency equipment to be located in the mine is located in Table 3-1. This equipment will be located in the mine pit and at the surface facilities. Fire extinguishers will be located at appropriate locations throughout the facility, in accordance with MSHA requirements. Mine and surface facility personnel will also be equipped with radios for general operation communication.

4 Emergency Telephone Numbers (205 (1)(c)(i through x))

Emergency response contacts and telephone numbers are listed in Table 4-1.

5 Contingency Plan Testing

During the course of each year, the facility will test the effectiveness of the Contingency Plan. Conducting an effective test will be comprised of two components. The first component will include participation in adequate training programs on emergency response procedures for those individuals that will be involved in responding to emergencies. These individuals will include the IC, Safety Officer, Environmental Officer, Public Relations Officer and other individuals designated to respond to fires and participate in mine rescue. Individuals will receive appropriate information with respect to their specific roles, including procedures and use of emergency response equipment.

The second component of a Contingency Plan testing will be to conduct mock field tests. At least one mock field test will be conducted annually. The Safety Officer will work with the Environmental Officer and the IC to first define the situation that will be tested. The types of test situations could include responding to a release of a hazardous substance, responding to a fire (aboveground or underground), or responding to a natural disaster such as a tornado. A list of objectives will be developed for planning and evaluating each identified test situation. A date and time will then be established to carry out the test. Local emergency response officials may be involved, depending on the type of situation selected.

6 Contingency Plan Submissions

Aquila shall submit a copy of the Contingency Plan to each Emergency Management Coordinator having jurisdiction over the Project Area. Updates to the plan will be provided as needed.

7 References

Foth Infrastructure & Environment, LLC, 2015a. *Mining Permit Application Back Forty Project*. October 2015.

Foth Infrastructure & Environment, LLC, 2018a. *Mining Permit Amendment Application Back Forty Project*, *Volume I*. November 2018.

Foth Infrastructure & Environment, LLC, 2018b. *Michigan Air Use Permit – Permit to Install Modification*. November 2018.

Michigan Department of Environmental Quality, 2019. Letter to Dave Anderson: *Michigan Department of Environmental Quality Comments dated February 15, 2019 on the Back Forty Project Mining Permit Amendment Application*. February 15, 2019.

Tables

Table 3-1
Emergency Equipment

Equipment	Location
ABC rechargeable fire extinguishers	Locations throughout mine including fuel and chemical storage facilities
Telephone mine communication system	Telephones will be located at key locations throughout the mine
Radios	Key facility personnel will be equipped with radios
First aid kits, stretchers, backboards, and appropriate medical supplies	Several key locations throughout the mine
Portable Refuge Stations	Several key locations throughout the mine
Spill kits (hydrocarbon and chemical)	Key locations throughout mine including fuel and chemical storage facilities
Water truck and fire hoses	Locations throughout mine including fuel and chemical storage facilities
HAZMAT response equipment	Central safety equipment location

Prepared by: WRV
Checked by: JOS1

Notes:
Locations of emergency equipment will be in accordance with Mining Safety and Health Administration requirements.
HAZMAT = hazardous materials

Table 4-1
Emergency Contacts and Telephone Numbers

Emergency Contact	Telephone Number
Facility Personnel	
Representative of Operator	Aquila Staff TBD
Emergency Management Coordinator	Aquila Staff TBD
Emergency Management Coordinator Alternate(s)	Aquila Staff TBD
Environmental, Health, and Safety Personnel	Aquila Staff TBD
Off-Site Emergency Personnel	
Local Ambulance Services	911
Hospitals	
Dickinson County Hospital - Iron Mountain MI	906-774-1313
Bay Area Medical Center - Marinette, WI	715-735-4200
OSF St. Francis Hospital & Medical Group - Escanaba MI	906-786-5707
Local Fire Department	911
Police	911
Michigan Department of Environmental Quality	800-662-9278
Pollution Emergency Alerting System	800-292-4706
Local Emergency Planning Committee	906-863-8917
Federal Agencies	
USEPA Region 5 Hotline	800-621-8431
USEPA National Response Center	800-424-8802
MSHA North Central District	800-746-1553
Michigan Department of Natural Resources	800-292-4706
Local Unit of Government Menominee County Supervisor Gerald Piche (District 7)	906-639-2657

Abbreviations:
TBD = To be determined
USEPA = United States Environmental Protection Agency
MSHA = Michigan Safety and Health Administration

Prepared by: AKM
Checked by: JEF1

Figure

435,000 E

436,000 E

437,000 E

5,034,000 N

5,033,000 N

MENOMINEE RIVER

RIVER ROAD DEAD END

TOPSOIL STOCKPILE

PROPOSED CUT-OFF WALL

LLCS1

LLCS2

LLCS3

LLCS4

TAILING MANAGEMENT FACILITY

NORTH WASTE ROCK FACILITY

SOUTH WASTE ROCK FACILITY

WEST ORE STORAGE AREA

EAST ORE STORAGE AREA

TREATED WATER DISCHARGE PIPELINE

COLLECTION SUMP

WAREHOUSE

FUEL STORAGE

CONTACT WATER BASIN

ROM PAD

COARSE ORE FLOTATION STOCKPILE

TRUCK SHOP

OXIDE ORE BIN

ELECTRIC UTILITY LINE

POWER SUBSTATION

MAINTENANCE SHOP AND WAREHOUSE

CHANGE FACILITY

ADMINISTRATION

GATE HOUSE AND FIRST AID STATION

PROCESS PLANTS

WASTEWATER TREATMENT PLANT

MINE AND PLANT GATES

TAILINGS AND CONCENTRATE PROCESSING AREA

LAYDOWN AREA

COLLECTION SUMP

NON-CONTACT WATER BASINS

EXPLOSIVES STORAGE

OVERBURDEN STOCKPILE

RIVER ROAD DEAD END AND CONNECTION TO SITE ACCESS ROAD

N

LEGEND

- MINERAL PROPERTY BOUNDARY
- PROJECT BOUNDARY
- 220 — EXISTING CONTOUR
- EXISTING BUILDING
- EXISTING ROADWAY
- EXISTING UNIMPROVED ROADWAY
- EXISTING TRAIL
- EXISTING TREE/BRUSH
- EXISTING WATER
- REGULATED WETLAND
- NWI NON-DELINEATED WETLAND
- DESIGNED PIT PERIMETER
- PROPOSED STRUCTURE
- PROPOSED WATER TREATMENT DISCHARGE PIPELINE
- 440 — PROPOSED DESIGN CONTOUR
- PROPOSED FINAL PIT CONTOUR
- PROPOSED CUT-OFF WALL
- PROPOSED EASTERN TRANSPORTION AND UTILITY CORRIDOR
- PROPOSED SITE ACCESS ROAD
- PROPOSED EASTERN CORRIDOR ROAD
- LLCS — LEACHATE AND LEAK COLLECTION SYSTEM

NOTES:

1. DIGITAL ORTHOPHOTO IMAGERY, TOPOGRAPHIC AND PLANIMETRIC DATA PROVIDED BY AERO-METRIC, INC., SHEBOYGAN, WI. DATE OF ACQUISITION: LIDAR-OCTOBER 31, 2007 AND IMAGERY-MAY 14, 2008.
2. HORIZONTAL DATUM BASED ON NAD 1983. HORIZONTAL COORDINATES BASED ON UTM ZONE 16 NORTH.
3. UPDATED SITE LAYOUT AND MINE PIT DESIGN SUPPLIED BY AQUILA IN SEPTEMBER, 2018.
4. WETLANDS CREATED FROM JUNE 2017 FIELD SURVEYS SUPPLIED BY KING AND MACGREGOR.
5. NATIONAL WETLAND INVENTORY (NWI) DOWNLOADED FROM MICHIGAN CENTER FOR GEOGRAPHIC INFORMATION.
6. DESIGN GRADES AND SHAPES ARE APPROXIMATE AND WILL BE UPDATED WITH THE PROJECT FINAL DESIGN.
7. PROPOSED EASTERN TRANSPORTATION AND UTILITY CORRIDOR SUPPLIED BY COLEMAN ENGINEERING IN OCTOBER 2018.

100 0 100 200 300

SCALE 1:10,000 METERS

FACILITY LAYOUTS SUBJECT TO CHANGE

Aquila Resources Inc.

Foth

Foth Infrastructure & Environment, LLC

REVISED	DATE	BY	DESCRIPTION

PREPARED BY:	AKM	DATE: MAR.'19
REVIEWED BY:	MJV2	DATE: MAR.'19
APPROVED BY:	SVD1	DATE: MAR.'19

BACK FORTY PROJECT

FIGURE 2-1

PROJECT SITE DEVELOPMENT PLAN
AMENDED CONTINGENCY PLAN

Scale:	AS SHOWN	Date:	MARCH 2019
Drafted By:	JOW	Project No.	17A021

X:\GB\IE\2014\14A021-00\CAD\MPA-Amendment\Figure 2-1 Overall Project Dev plan Amended Contingency Plan.dgn
3/6/2019 jow