

**Compiled Responses to  
Public Comments  
Regarding the Permit Applications and  
Related Regulatory and  
Administrative Concerns about the Proposed  
Back Forty Mine Project**

## Permit Application Review and Public Participation Process

Aquila Resources Inc. (Aquila) is proposing to develop an open pit gold, zinc, and copper mine and processing facility in Lake Township, Menominee County, Michigan. The proposed project requires several permits from the Michigan Department of Environmental Quality (MDEQ).

Aquila has applied to the MDEQ for:

- **Air Use Permit** – The proposed mine and mill operation requires a permit for new sources of air emissions under Part 55, Air Pollution Control, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (NREPA). The proposed mine and ore beneficiation and processing facility must meet state and federal air quality requirements. The draft permit conditions include emission restrictions and operational requirements.
- **National Pollutant Discharge Elimination System Permit (NPDES)** – The proposed mill operation requires a permit to discharge to surface waters of the state under Part 31, Water Resources Protection, of the NREPA. The permit contains conditions and requirements to assure that all water quality standards will be met and the designated uses of the receiving waters will be protected.
- **Nonferrous Metallic Mineral Mining Permit** – The proposed mine and mill operation requires a Mining Permit under Part 632, Nonferrous Metallic Mineral Mining, of the NREPA. That permit includes financial assurance, to conduct mining and milling operations. The draft permit specifies conditions to assure the mine and milling operation meets the requirements of the law and will protect natural resources, the environment, and public health.

A fourth permit application, for impacts to wetlands, will be considered by the MDEQ in a separate review process.

The MDEQ formed a multi-discipline/multi-agency Mining Team (MT) to review the Mining Permit application. The MT consisted of technical experts from the MDEQ, the Department of Natural Resources (MDNR), and the Michigan State Historic Preservation Office (SHPO). Collectively, the MT members have the requisite background and expertise in geochemistry of ores and sulfide minerals, water chemistry, containment and monitoring of waste materials, air and water monitoring, financial assurance, soil erosion, mine reclamation, fish and wildlife habitat and protection, endangered species, wetlands, and other pertinent areas.

The MDEQ held a public meeting on the Mining Permit application on January 5, 2016. The MDEQ received public comments at the public meeting, and accepted written comments throughout the review process. The MT submitted a request to Aquila for additional information regarding the application on May 9, 2016. The request incorporated pertinent public comments that had been received as well as questions arising from the MT's independent evaluation. Part 632 required the MDEQ to make a proposed decision by March 15, 2016, taking into account a 14 day extension of the comment period as requested by the public. However, Aquila agreed to extend the time line for a proposed decision three times to allow time for the MDEQ to

coordinate the technical reviews of all NREPA permit applications for the project, complete the review of supplemental information to the Mine Permit Application submitted by Aquila on June 5, 2016, and coordinate a consolidated hearing for all NREPA permit decisions.

The MDEQ held a public participation process on their proposed conditional approval of the three permits. Copies of the Notice of Public Hearing, the Public Hearing Process, the Proposed Decision on the Part 632 Permit, Draft Permit Conditions, fact sheets and the draft terms and conditions for the Air Use Permit to Install, and fact sheets and the draft terms and conditions for the NPDES Permit, were provided for public review and placed on the Internet on MDEQ Web site pages.

Notices announcing the consolidated public comment period and hearing were placed in the Eagle Herald and the Menominee County Journal. Each notice provided pertinent information regarding the proposed action; the locations of available information; a telephone number to request additional information; the date, time, and location of the public hearing; the closing date of the public comment period; and the address where written comments were being received.

The MDEQ held the public hearing at Stephenson High School gymnasium, W526 Division Street, Stephenson, Michigan 49887 on October 6, 2016, from 6:00 P.M. to 10:00 P.M. CST to accept public comment on the proposed decision.

## Response to Comments

1. **Comment:** The MDEQ should deny a permit based on general concern for unspecified damage to the environment, natural resources, or esthetic values. (This is a generalization of comments from multiple participants.)

**Response:** The MDEQ acknowledges the concern over general environmental impacts from mining operations. The environmental standards and criteria under the NREPA are designed to address those concerns, and the decision to grant or deny a permit will be based on whether the application conforms to those standards and criteria.
2. **Comment:** This project will create a positive economic impact with construction, direct and indirect jobs, as well as tax revenue. We have seen the benefits mining has provided to communities, families, businesses, schools, and universities in this region.

**Response:** The MDEQ recognizes the importance of jobs and the economy; however, the decision to grant or deny a permit will be based on whether the application conforms to the applicable environmental standards and criteria under the NREPA.
3. **Comment:** I do not want this mine so close to the Menominee River.

**Response:** The location of the mine is controlled by the location of the ore body. The proposed permits include extensive provisions to protect the river.
4. **Comment:** This project will cause disturbance of all wildlife.

**Response:** The MDEQ found in its review that the Mining Permit application meets the requirements of the NREPA with respect to wildlife impacts.
5. **Comment:** The mine is directly across the river from our property. It is loud. It is putting horrible toxins into the air and the water. It isn't just a disturbance to the residents and visitors, but devastating for the health of the land, water, and all the wildlife that call it home. This isn't something that can be reversed.

**Response:** The mine will be required to adhere to the strict environmental limits outlined in the permits. MDEQ staff will conduct regular inspections of the facility to confirm compliance.
6. **Comment:** The permitting process should be expedited and improved for the Back Forty project. The permitting process should be condensed and streamlined to bring projects into development with less delay. The permitting process has become too time-consuming and costly.

**Response:** For all MDEQ environmental permits required for this project statutory time lines must be followed. The MDEQ has been diligent in conducting an expeditious but thorough review.
7. **Comment:** In October 2010 a 360 foot crack opened up close to the proposed site. Aquila would not have any means to prevent a disaster if this happened. Spillage of contaminated materials would occur as a result of this event.

**Response:** The Upper Peninsula of Michigan is in a seismically stable area, so earthquakes are not common in the Upper Peninsula. Experts have determined that the

crack referenced in the comment was a geological “pop-up” that occurred when underground pressure on the limestone rock in the area was released, allowing the crack to form, possibly as a result of stored pressure from when the glaciers receded. It was determined that the stress in that area has been relieved, and another event such as this is unlikely in that vicinity. Additionally, the geology at the Back Forty Project is not the same as in the area where the crack occurred, and such an event is not expected to occur at the Back Forty site, or to have any impact on the proposed operations even if it were to occur.

8. **Comment:** This mining would put pressure on the limestone layers and cause future damaging problems.  
**Response:** The mining operation will not be mining through or affecting any limestone layers, as no limestone layers exist in the mining area.
9. **Comment:** Why is MDEQ supporting this project?  
**Response:** The MDEQ is neither supporting nor opposing the proposed project; rather, the agency is carrying out its responsibility of administering the existing Michigan laws and rules.
10. **Comment:** Tell the company to dig in Canada where they are from...they can ruin the land up there.  
**Response:** While the metals of interest at the Back Forty site can be found elsewhere, not all metal deposits are economic. The MDEQ does not dictate where to mine; it only evaluates proposed mining sites and operations for conformance to Michigan laws and rules.
11. **Comment:** The Menominee River is listed as an Area of Concern (AOC) under the Great Lakes Water Quality Agreement due to past industrial abuses including paper mill effluents, arsenic contamination, paint sludge, coal tar, and PCB contamination resulting millions of dollars in taxpayer money to address. It is irresponsible to permit a mine that has a high likelihood of causing further contaminating an AOC in the process of remediation.  
**Response:** MDEQ statutes and rules are protective of human health, natural resources, and the environment. In addition to the permit requirements, the MDEQ will require robust monitoring to identify any potential problem long before it becomes unmanageable.
12. **Comment:** We are deeply concerned about the effect on our groundwater and air and noise pollution (by Lake Mary) if the mine is approved.  
**Response:** Permitting and monitoring requirements will prevent impacts to groundwater adjacent to the mine site. The MDEQ does not have authority to regulate noise from the mine. Impacts to the air outside the mine site are expected meet the health protective standards set by the U.S. Environmental Protection Agency (USEPA) and the health based standards set by the MDEQ. See Tables B and E of the Air Quality Division (AQD) Fact Sheet for further information.

13. **Comment:** No mine no matter its process has been environmentally successful. All have created contaminated effluents that have caused serious long lasting problems to adjoining areas and waters.  
**Response:** Historically mines operated with little or no environmental regulations or oversight. This resulted in many contaminated mine sites. However, with the advent of contemporary mining laws and regulatory oversight based on lessons learned from historic mining practices, mines are now operating within modern environmental standards.
14. **Comment:** Our review suggests that this project is clearly flawed in both design and intent.  
**Response:** MDEQ MT conducted a detailed and comprehensive review of the Back Forty application and concluded the permit could be issued with strict conditions.
15. **Comment:** The pollution that will be caused by this mine will harm aquatic life; taint or kill recently seeded wild rice beds, and possibly reverse gains made in sturgeon repopulation of the Menominee River.  
**Response:** All MDEQ permits are protective of aquatic resources.
16. **Comment:** Wisconsin residents deserve a stake in deciding on whether or not to permit this mine.  
**Response:** The MDEQ has consulted with the Wisconsin DNR and the USEPA to assure the mine will meet all environmental regulations. This is true for all industry on or near the Menominee River, whether on the Michigan or Wisconsin side.
17. **Comment:** This mining permit needs federal oversight in a multi-state area.  
**Response:** As mentioned above, the MDEQ has consulted with the Wisconsin DNR and the USEPA to assure the mine will meet all environmental regulations. Furthermore, air and water permits are routinely reviewed by the USEPA.
18. **Comment:** There has been no weight given to the fact that the majority of those who have commented are against the mine.  
**Response:** MDEQ permit decisions are based on whether an application complies with Michigan and federal law and regulations, and incorporate science and engineering criteria.
19. **Comment:** An accident involving hazardous waste or chemicals will jeopardize the public health and safety of nearby residents.  
**Response:** State regulations and permit conditions are designed to prevent risks to public health and safety. Mining Permit applications must include contingency plans to reduce and respond to accidents.
20. **Comment:** What is the MDEQ oversight on the project? The MDEQ or DNR won't even monitor it.  
**Response:** The MDEQ monitors mines and other regulated operations on a regular basis; this includes routine and unannounced inspections of facilities to assure compliance.

21. **Comment:** Has the MDEQ made any determination about the human rights implications of its decision to allow the Back Forty project to go forward?

**Response:** Michigan laws and regulations take into account the rights of all persons affected, or potentially affected, by operations subject to permits. Property owners may develop their resources if they are able to meet the strict environmental requirements under Michigan's laws.

22. **Comment:** What has the MDEQ done to restore trust in its authority, and reassure the Menominee and people living downstream from the Back Forty project in Michigan and Wisconsin that it will exercise appropriate care? How does the MDEQ intend to quell public concern that it is compromised or incompetent, and reassure the public that it is a responsible steward?

**Response:** MDEQ employees involved in the Back Forty project are dedicated to protecting the environment, natural resources, and public health and safety, and they do not take their jobs lightly. That approach has been stressed by MDEQ managers.

The MDEQ has listened to comments of Michigan residents and visitors throughout the review process and have engaged with tribes, local units of government, and the general public to provide information regarding MDEQ laws and regulations, answer questions about the proposed project, and accept comments and recommendations.

The MDEQ will not issue final permits for the mine unless we are assured the proposed operations will be protective of the environments as well as public health and safety, including the Menominee River.

23. **Comment:** Aquila Resources is not capable of opening and operating a mine on the proposed Back Forty site.

**Response:** The MDEQ will determine whether Aquila Resources has submitted a plan of operations under which the company can successfully operate the proposed mine while protecting the environment, natural resources, and the environment. If permits are granted, the MDEQ will monitor the operation of the mine to assure it is in compliance with the plans and regulations.

24. **Comment:** The proximity of the proposed operations to the river which serves integral human and wildlife dependency cannot possibly be cost effective outside of this Company's net benefit.

**Response:** The laws and regulations assure that a mining company does not profit at the expense of degradation of human and wildlife values.

25. **Comment:** Have the risks been properly discerned for the homeowners downriver?

**Response:** Risk assessment was an integral part of evaluating the permit applications and developing the strict permit conditions.

26. **Comment:** Marinette County, as well as across the river in Michigan, will be negatively affected by the toxic pollution incurred through the mining process.

**Response:** The MDEQ has determined the permit application commitments and permit conditions will be protective of water quality.

27. **Comment:** Both Wisconsin and Michigan have good tourism which could greatly be affected.

**Response:** Michigan's environmental laws do not directly set standards for impacts to tourism; however, it should be noted that Michigan has mining districts with a strong tourism industry.

28. **Comment:** I am concerned about the possible drop in property values.

**Response:** Michigan's environmental laws do not directly set standards for impacts to property values; however they do protect property from adverse impacts to air, land, and water quality.

29. **Comment:** Much of the construction will be by contractor employees that will more than likely come from other locations for short term assignments by the contractor until construction is complete. Once construction is complete employment opportunities will not be significant in light of the need for jobs in Michigan's Upper Peninsula.

**Response:** Michigan's environmental laws do not address labor impacts.

30. **Comment:** If the precious metal content is less than expected and can't provide the revenue to support the operation, will Aquila Resources or another potential operator who acquires the permit just walk away?

**Response:** Market conditions definitely dictate the life of a mine; therefore, MDEQ will require a substantial financial assurance amount to allow the MDEQ to properly close the facility in the event that the permittee ceases operations without proper reclamation or necessary remediation.

31. **Comment:** Has the Michigan MDEQ read and researched the legal descriptions for the property in question back to a point prior to the land being in the hands of the permit applicant?

**Response:** It is the applicant's obligation to gain legal control of the property. If a citizen questions the legality of control the issue would be decided in civil court.

32. **Comment:** State of Michigan is incapable of knowing what damage water discharged from this a Sulfide Mine would cause the Menominee River ecosystem.

**Response:** MDEQ has an abundance of experienced staff to evaluate a proposal to determine if water quality standards can be met.

33. **Comment:** In September the applicant withdrew its wetland permit application after MDEQ discovered that the applications was based on outdated state maps and that the application failed to identify all of environmental sensitive areas on this site. This sort of significant resource mapping error by the application strongly suggests that the MDEQ needs to give much closer scrutiny to each of the other key representations by the applicant.

**Response:** The applicant withdrew their application due to additional information requested by the department. The applicant determined that the requested information could not be obtained within the timeframe required by the MDEQ's administrative deadlines and withdrew the application to provide time to obtain the requested information.

34. **Comment:** Since a wetland permit is pending, the issuance of other MDEQ permits is premature, and should be reevaluated in light of new wetland information submitted in a new wetland application.

**Response:** A Part 632 mining permit is not effective until all other permits required under the NREPA for the proposed mining operation are obtained.

35. **Comment:** Processing of the air, water, and mining permits without an accurate wetland application makes it appear that the MDEQ does not care what the potential environmental consequences of those decisions are, which would be a violation of the requirements of the Michigan Environmental Protection Act, Part 17 of NREPA, MCL 324.1701 – 324.1706.

**Response:** As stated above, the mining permit is not effective until all other permits are obtained. Furthermore, the MDEQ will not issue final permits for the mine unless we are assured the proposed operations will be protective of the environment.

36. **Comment:** Issuance of NPDES or air emission discharge permits cannot remove the risk of irreparable harm.

**Response:** Environmental risk is strongly considered in the decision process and is addressed in permit conditions.

37. **Comment:** The Back Forty mine project would potentially harm or destroy cultural resources that are critical to the Menominee Indian Tribe. Aquila's archaeological report has underestimated the actual number of culturally significant sites found within the footprint of the project. Furthermore, the Tribe was not involved in formal consultation during any surveying activity with the Commonwealth Cultural Resources Group (CCRG) or Section 106 group on the project site.

**Response:** Aquila Resources provided a detailed cultural resource study of the proposed mine site and surrounding area, which was reviewed by the Michigan State Archeologist. The survey identified several important cultural resources, some previously documented, and some new discoveries. In light of that survey, the mine was designed to avoid impacting all documented resources. Further, the applicant prepared an unanticipated discovery plan in the event that additional resources are encountered as the project moves forward.

38. During the development of the survey, Aquila Resources invited tribes, including the Menominee, to participate in identifying cultural resources on the site that may be impacted by the mine. The MDEQ met with the Menominee Indian Tribe on several occasions to discuss the tribe's concerns.

**Comment:** The State owes the Tribe more than a mere chance to comment. The State of Michigan should insist that the mining company fully engage with the Tribe as if Section 106 of the NHPA did apply.

**Response:** The applicant has not applied for any federal permits for the project. Therefore, the National Historic Preservation Act (NHPA) does not apply. That being said, in the early stages of the cultural survey, the Michigan State Archeologist advised Aquila Resources, and their consultants, to conduct the survey to comply with Section 106, including providing opportunities for tribes to contribute. The MDEQ believes the study substantially conforms to Section 106.

39. **Comment:** Tribal members consider the project area a sacred landscape that is related to their creation narratives.

**Response:** The MDEQ acknowledges the importance of the area to tribal members. Therefore, MDEQ and the State Archeologist met with the Menominee to discuss their concerns and agreed to include reasonable permit conditions that would protect identified cultural resources.

40. **Comment:** As a Toronto-based company, Aquila Resources should be held to Canadian standards for securing the “free, prior and informed consent” of indigenous people.

**Response:** MDEQ followed a formal Michigan-based process for engaging with tribes.

41. **Comment:** The applicant inappropriately compares the Flambeau Mine in Wisconsin to the Back Forty project. Unlike the proposed project, the Flambeau had tailings off site, and the Back Forty pit is twice the size and three times as deep as the Flambeau Mine.

**Response:** The MDEQ agrees that there are significant differences between the two mines; however, there are some important similarities that have been considered in the decision. One particular similarity is the proximity to the river and the installation of the grout curtain. While the scale of the two operations is different, the same principles of effective environmental protection apply.

42. **Comment:** Has Aquila Resources proposed has proposed to fund a program similar to the CEMP for Eagle Mine and Humboldt Mill?

**Response:** The MDEQ is unaware of a similar program being proposed by Aquila.

43. **Comment:** Explain the specific ways that “land uses in the surrounding areas” will be “affected in a positive manner” and whether the community input was sought in planning these land use changes. Specifically, were the boards of Lake Township, Menominee County, or Marinette County consulted?

**Response:** The area of the proposed mine site is zoned for mining. It is the responsibility of the local zoning to consider surrounding land uses. The MDEQ’s responsibility is to assure that environmental values will not be compromised in surrounding areas.

44. **Comment:** The Land Transaction has not been officially presented for public input at an NRC meeting. The MDEQ’s premature “proposed decision to grant a Mining Permit to

Aquila” appears to steamroll the NRC decision-making process and circumvent public input on the disposition of State Land.

**Response:** The MDEQ has no authority to regulate land transactions. Permits are based on current land ownership and/or lease agreements. State land transactions are independent of MDEQ environmental permit decisions.

45. **Comment:** The application fails to analyze health risks and impacts on communities who rely on fishing for subsistence, including risks from toxic heavy metals, arsenic, methylmercury, use of cyanidation, and acid mine drainage, and fails to provide long-term monitoring of the environmental impairment.

**Response:** The applicant provided a detailed geochemical assessment in their application. The MDEQ will not issue any permit if it is not assured it will be protective of aquatic life and other environmental values.

46. **Comment:** The MDEQ failed to note that a paved County Road, River Road, would need to be abandoned and another road at some yet to be disclosed locations would need to be built. How many millions of dollar of taxpayer’s money would be used for this project that the MDEQ has not taken into consideration?

**Response:** The abandonment or relocation of River Road falls under the jurisdiction of the appropriate road commission and is not under the purview of the MDEQ.

47. **Comment:** The shortage of personnel and dollars to sufficiently monitor and regulate a large sulfide mining project such as is proposed is part of the problem.

**Response:** The MDEQ has the appropriate number of skilled staff, as well as the necessary funding sources, to regulate mining.

48. **Comment:** Please hold Aquila to the highest accountability standards.

**Response:** The current draft permits contain strict permit conditions necessary to meet the requirements of Michigan law and regulations.

49. **Comment:** I think it is very disrespectful to dig up Indian burial mounds for this project.

**Response:** The proposed mine plan is designed to avoid known Native American cultural resources.

50. **Comment:** Another 32,000 acres owned by the state will be leased to the Back Forty Project. What are they going to do with this leased land?

**Response:** Should the MDNR lease the land to the applicant, and should the applicant wish to use that land for any lawful activity, the use of the land would be regulated under the terms of the lease.

51. **Comment:** Aquila is allowed to dump 20,000-30,000 tons per month of cyanide waste into our rivers and 1.5 million gallons of treated and potential sulfide acid water each day.

**Response:** The suggested amount of cyanide waste allowed to be discharged each month is not accurate. The type of cyanide of concern in surface water is free cyanide (i.e., cyanide available). The daily maximum free cyanide concentration and load that would

be permitted if a limit were necessary would be 44 micrograms per liter, or 18 pounds per month, in comparison to the suggested load of 20,000 to 30,000 tons per month submitted in the comment. The maximum authorized discharge volume of treated wastewater is 1.52 million gallons per day and will consist of treated mine drainage, treated wastewater, and treated storm water. The draft permit includes monitoring requirements for available cyanide because the estimated discharge concentration of this pollutant is below the level which would require discharge limits.

52. **Comment:** Sooner or later a disaster, leak, or malfunction will occur whether in the mine plant or trucking on local roads. Who is qualified to respond with help? What is the containment for hazardous materials?  
**Response:** In the event of an environmental incident, the applicant has an emergency response plan that includes notifying qualified MDEQ staff.
53. **Comment:** What roads do they take to get to the mine site? How many trucks per day/week?  
**Response:** Truck traffic and routes outside of the mine site are not within the regulatory authority of the MDEQ.
54. **Comment:** What is wrong with rejecting an application based on questionable data, lack of determination of economic viability, no experience, and not assurance that financial backing can be found?  
**Response:** The MDEQ would not issue a permit if the application contained questionable data. The economic viability of company will be determined based on whether it is capable of fulfilling the strict permit conditions and the financial assurance requirements. A mining permit is not effective until both conditions are met.
55. **Comment:** Arrange for an independent “Environmental Impact Study” to be performed by the U.S. Environmental Protection Agency and the U.S. Department of the Interior concerning the environmental, social, and economic impact of the proposed Menominee River-Shakey Lakes mining operation.  
**Response:** There are no provisions in Part 632 to require an Environmental Impact Statement. However, Part 632, Rule R425.202, requires the applicant to complete a very detailed and thorough Environmental Impact Assessment. This assessment includes evaluating potential impacts to surrounding water features.
56. **Comment:** Sulfide mines create toxic wastes that are of a permanent nature and are not remediable in the short or long term.  
**Response:** Part 632 was developed to address the unique nature of non-ferrous mining specifically to protect against release of toxic wastes or leachate to the environment. This includes requiring liners and water treatment.
57. **Comment:** Menominee County already has a 2003 resolution – Banning the Use of Cyanide – a point which is being ignored by the applicant.  
**Response:** A local unit of government cannot enforce resolutions that duplicate, contradict, or conflict with Part 632. Use of cyanide (in mining or other industries) is

not prohibited by state law; however, cyanide solutions must be contained and treated so as not to impact the environment.

58. **Comment:** There is not a sufficient energy supply source which would necessitate still further disruption of the local area and surroundings during the construction phase of a larger capacity power supply; and, for the removal of same after the mine closes. Additional wetlands permits would likely be needed to construct this type of power grid.  
**Response:** Any potential environmental impacts from potential (but currently unidentified) future power generation will be addressed under the appropriate environmental statutes and regulations.
59. **Comment:** The current roads are subject to weight-restrictions during the spring season.  
**Response:** If the mine is built, the company will have to adhere to all road restrictions.
60. **Comment:** Being that the State of Michigan is part of the Great Lakes Initiative, this permit application with its many potential risks and very little reward (except for the company) could find itself in a precarious legal position with the other partners if the predicted and expected pollution occurs and defeats all the great work this Great Lakes Initiative group has successfully accomplished in past years.  
**Response:** The MDEQ will not issue final permits for the mine unless it is assured the proposed operations will be protective of the environments as well as public health and safety, including the Menominee River and the Great Lakes.
61. **Comment:** Financial assurance funds won't be readily available to clean up a problem.  
**Response:** Mining cannot begin until proper financial assurance is approved by the MDEQ.
62. **Comment:** The loss of the Menominee River fishery due to pollution caused by operational mistakes of the mine and its processing facilities by an uninformed, inattentive, or disgruntled employee or from miscalculations in the mine's operations would be devastating.  
**Response:** MDEQ acknowledges that accidents can happen; therefore, the applicant is required to use best mining practices, develop contingency plans, and implement a robust monitoring plan to identify problems before they become unmanageable.
63. **Comment:** There should be a traditional cultural properties investigation initiated so that we could assess the cultural properties within the Menominee River system that are significantly impacted by this mine.  
**Response:** The applicant performed all of the studies required by Michigan Law. Further, MDEQ has consulted with, and Aquila has engaged with, tribes to identify resources of importance.
64. **Comment:** I wonder if all of your jobs are dependent on this mine going through.  
**Response:** No MDEQ jobs are dependent on this project.

65. **Comment:** Currently there is no protection under Michigan law that would provide for the repatriation of human remains within the burial sites. The State of Michigan does not and will not adhere to the policies established by the National Historic Preservation Act, and Native American Repatriation Act.  
**Response:** While this issue is outside the subject matter of Michigan environmental laws, there are other Michigan laws that protect human remains.
66. **Comment:** Perhaps in hindsight after discovering the multitude of erroneous issues with this application, this permit should not have been considered “administratively complete” initially due to its excessive lack of required data.  
**Response:** The determination of administrative completeness for the mining permit considers only whether all of the required elements of an application are included, not the adequacy of the information.
67. **Comment:** Their own testing suggests that material with more than 0.3% sulfide will go acid, because there is virtually no natural buffering material (such as calcium carbonate) present in the host rock. Additionally over 75% of the waste rock is expected to generate acid. Yet, details of wastewater treatment system to handle this acid are not yet developed.  
**Response:** That is correct, that is why the applicant is proposing to manage all waste to prevent untreated leachate from being released. Water treatment plants are designed based on the chemistry of the influent. It is typical to make adjustments in the process.
68. **Comment:** Detailed drawings or plans are still not yet available on some major mine site components. These plans may take considerable time to develop.  
**Response:** That is correct, and until the MDEQ approves the plans the applicant cannot begin construction.
69. **Comment:** Why was the required information not originally provided? Why is it not available? When will it be submitted?  
**Response:** The mining statute allows for some detailed designs of facilities that are widely used and accepted in industry, such as a water treatment plant, to be submitted prior to construction of the facility.
70. **Comment:** I have very little faith in the 2 liner system that Aquila talks about.  
**Response:** The liner system requirements as established by Michigan’s Mining Law are a proven technology utilized as containment systems for both mining and solid waste facilities. The MDEQ will oversee construction activities and monitor performance throughout the life of the mine to ensure the integrity of the system.
71. **Comment:** There is already a functioning processing facility (the Humboldt Mill) in the Upper Peninsula that can handle the processing of these types of ores. Due to the high potential for the pollution of the air and water along the Menominee River and other waters, this alternative plan should be considered as one of the primary sites of choice for processing the ore due to its location, away from the Menominee River.

- Response:** The distance a mining operation can transport coarse ore is a function of economics. The ore at the Back Forty Mine cannot economically sustain additional transportation costs. Plus, if processed at the Humboldt Mill, the same treated discharge water would be pumped to the Escanaba River.
72. **Comment:** The Company owns other land on which it could locate a processing plant which would greatly reduce the risk of potential perpetual harm to the Menominee River. However, they have refused to consider the site where they have a storage facility with office space already available. Rail line and state highway also run very near the building.  
**Response:** Aquila conducted tradeoff studies to determine if transporting the coarse ore off site was economically feasible. Refer to comment #71.
73. **Comment:** Contingency plans are virtually non-existent. Rule Section 425.205 (1) (a) and (b) lists the minimum requirements. Per this portion of the rules, there are numerous conditions listed in the “draft” permit that are insufficiently or not addressed at all.  
**Response:** A detailed contingency plan is located in Volume IE, Appendix J of the Mine Permit Application.
74. **Comment:** Description of materials, methods, and techniques that will be utilized is not sufficient.  
**Response:** The application describes in the mining plan the materials, methods, and techniques the will be used, except that such information may not be required for methods, materials, and techniques that are widely used in mining or other industries and are generally accepted as effective.
75. **Comment:** R 324.632205 (2) (c) (i), (ii), and (v): “Meeting industry standards” and little or no impact is anticipated” are not appropriate responses.  
**Response:** The MDEQ will determine whether provisions for industry standards and findings of little or no impact meet the requirements of Part 632.
76. **Comment:** There are too many unaddressed items to satisfy the condition that the applicant has the burden of proof.  
**Response:** The MDEQ MT concluded the applicant met the burden of proof.
77. **Comment:** Little effort has been demonstrated by the applicant to survey and study the archaeology of the historical and cultural sites. These comprehensive studies must be completed prior to any disruption of these sacred tribal sites.  
**Response:** The applicant conducted extensive research and archaeological surveys of areas within the project footprint that could be potentially disturbed. The surveys identified some cultural resources both within and outside the footprint, but none of the identified resources will be disturbed by the proposed mining activities.
78. **Comment:** The permit fails to protect plants and animals at the Shakey Lakes Savanna.  
**Response:** The MDEQ MT concluded the Part 632 permit is protective of plants and animals in the surrounding area.

79. **Comment:** The EIA missed the local colony of Cerulean warblers, as observed by Ryne Rutherford in the Shakey Lakes area in 2007.

**Response:** The MT found that the methods and information presented in the EIA wildlife reports satisfy the requirements of the rules under Part 632.

80. **Comment:** Habitat for the dwarf lake iris exists within the proposed mine area, and it should be carefully surveyed before any bulldozing or other construction is done.

**Response:** Dwarf Lake Iris (*Iris lacustris*) typically occurs near Great Lakes Shorelines and the habitat is found on sand or in the soil over calcareous gravels or bedrock. No suitable habitat for this species has been identified on or near the proposed project site.

81. **Comment:** The EIA did not consider or survey for the federally-endangered Hines emerald dragonfly (*Somatochlora hineana*) or other insects. According the EIA, emergent marsh and northern wet meadow natural communities occur within the project area. Both of these communities have been associated with the occurrence of the Hines emerald dragonfly. Historic records exist in the Shakey Lakes area for the American burying beetle (*Nicrophorus americanus*), also listed as federally endangered. Another federally-listed insect for which habitat occurs in the project area is Mitchell's Satyr Butterfly (*Neonumpha mitchellii mitchellii*).

**Response:** *Nicrophorus americanus*: The American burying beetle was last recorded in Menominee County on June 18, 1940 and is currently listed as extirpated.

*Neonumpha mitchellii mitchellii*: The Mitchell's Satyr Butterfly has had approximately 30 known occurrences at sites in Michigan near the Indiana border. Suitable habitat is prairie fen wetlands supported by carbonate-rich groundwater seeps. This habitat is not present within or near the proposed project site. No occurrences of this species have been documented within the Upper Peninsula or north of the climatic tension zone.

*Somatochlora hineana*: Habitat types are gaminoid dominated wetlands typically located over dolomite, and often referred to as a calcareous fen. These wetland types do not occur in or around the project area and there have been no observances of the Hine's Emerald Dragonfly in the Upper Peninsula outside of Mackinac County.

82. **Comment:** Populations of a number of uncommon and rare plant species will be directly destroyed by the mine, including the state-threatened Vasey's rush, the state special concern plant Hill's thistle, and yellow water crowfoot (*Ranunculus gmelinii*), listed as "threatened" in neighboring Wisconsin, as shown in Figure 3-34 of Volume II of the EIA.

**Response:** The occurrences of Michigan threatened and endangered species on this property including Vasey's rush (*Juncus vaseyi*) and Dwarf Milkweed (*Asclepias ovalifolia*) and a species of special concern, Hill's thistle (*Cirsium hillii*) are being assessed by the DNR for impacts. If they are found to be potentially impacted, the proposed mining operations cannot proceed until the issue is resolved. Yellow water crowfoot (*Ranunculus gmelinii*) is not a listed species in Michigan.

83. **Comment:** Bats were not surveyed as part of the EIA.

**Response:** Aquila Resources informed the MDEQ their mine permit applications were completed prior to the new requirements for bat surveys. Therefore, the MDEQ included a permit condition requiring Aquila Resources to submit a survey for approval prior to construction.

84. **Comment:** The Escanaba State Forest Shaky Lakes Oak-Pine Barrens Ecological Reference Area and a bio-diversity stewardship area will be jeopardized with an open pit sulfide mine.

**Response:** It is unclear how the area will be jeopardized. All approved permits for the mine will be protective of the environment.

85. **Comment:** An unexpectedly high flood could easily wash substantial sulfide and many other heavy metal pollutants into the river.

**Response:** This issue was raised in MDEQ's request to Aquila for additional information on May 9, 2016. Aquila responded with documentation showing the following:

- Only a 100,000-year flood event would inundate the project.
- The likelihood of a 10,000-year flood over a 50 year period is less than 0.5%. A 10,000-year flood event would not inundate any project facilities.

86. **Comment:** There has not been a full scale worst case analysis for this mine. There is no reference to any worst case analysis or assessment in the EIA. To adequately plan for the "necessary environmental protection measures" for the financial assurance, the applicant would have to complete a worst-case-scenario analysis that addressed potential contamination beyond what was expected. Without that analysis, the decision makers are acting without adequate information and not making an informed decision.

**Response:** There are no provisions in Part 632 to develop a worst case analysis. However, a detailed contingency plan was submitted in the Mine Permit Application that addresses all identifiable potential accidents and incidents.

87. **Comment:** The information submitted during the public comment period constitutes significant new information. Therefore the MDEQ should require the applicant to revise their Environmental Impact Assessment to fully address new information, and allow public comment on any revised analysis.

**Response:** The MDEQ reviewed and considered all the public comments submitted and concluded no additional information was required from the applicant.

88. **Comment:** What is projected as "Life Of Mine" of seven years for the Back Forty Project as represented to the MDEQ is not consistent with what has been represented to investors and the DNR on the proposed land swap as a "sixteen year life of mine." The cumulative impacts analysis has to take into account the Life Of Mine. It is impossible to accurately assess the environmental impacts of the Back Forty project when false information was provided concerning the nature, methods, duration, and extent of the Company's mining plan.

**Response:** Aquila presented a seven year life of mine in their Mine Permit Application. Any significant changes to the mine plan will require an amendment to the permit and will be subject to the same review as this application.

89. **Comment:** The cumulative impact analysis has to take into account the perpetual care nature of the site post mining.  
**Response:** At the end of mining, the mine will be backfilled and the surface infrastructure will be reclaimed and revegetated. The tailings facility will be capped and revegetated similar to a landfill. The application estimates it will take approximately 50 years for tailings pore water to drain from the capped tailings to the leachate collection system. Even though it is a long term process, it does not constitute perpetual care.
90. **Comment:** The Center for Science and Public Participation (CSP) identified significant problems with the application materials, including that the contamination potential from the mine is very high and the financial assurances are significantly underestimated.  
**Response:** The MDEQ reviewed the CSP report and incorporated some of the suggestions in the MDEQ request to Aquila for additional information. The MDEQ MT evaluated contamination potential and concluded the engineered controls presented in the Mine Permit Application are capable of controlling contamination. The MT also determined that the financial assurance amount is adequate for the operation.
91. **Comment:** Since the entire project is contingent on a land swap with the Michigan DNR, it makes no sense to move forward with permitting of the mine through MDEQ.  
**Response:** The MDEQ environmental permitting processes are independent of MDNR land management decisions.
92. **Comment:** In the permit papers submitted by Aquila Resources – the Menominee River is described as “not a significant waterway”, and “not a part of the Lake Superior basin.” What they fail to mention is that it is a part of the Lake Michigan basin.  
**Response:** The MDEQ was unable to locate any reference to “not a significant waterway” in any of the application materials. However, in the NPDES Permit Application the Menominee River is not considered outstanding state resource water.
93. **Comment:** No matter how the tailings are stored they will generate sulphide or sulphite acids/toxin perpetually.  
**Response:** By constructing the tailings facility with a composite liner and then capping the facility with a composite cap, oxygen penetration into the tailings and water percolation into the tailings will be eliminated so the facility will not be perpetually generating acid.
94. **Comment:** Part 632 state that nothing in the process shall violate the public trust. The permit could be denied on that alone.  
**Response:** It is unclear what the commenter is referring to; however, Part 632 324.63205 (11)(b) states in part “The proposed mining operation will not pollute, impair, or destroy the air, water, or other natural resources or the public trust in those resources, in accordance with part 17 of this act. In making this determination, the department shall take into account the extent to which other permit determinations afford protection to natural resources. For the purposes of this

subsection, **excavation and removal of nonferrous metallic minerals and of associated overburden and waste rock, in and of itself, does not constitute pollution**, impairment, or destruction of those natural resources.”

95. **Comment:** Part 632, R425.503, Report of Incident,...no shutting them down, no physical onsite inspections by State officials.  
**Response:** The MDEQ investigates all incidents that have the potential to impact the environment.
96. **Comment:** Time, erosion, and permafrost will cause the Pit to fail, causing poison to pollute our drinking water that no amount of money will be able to fix.  
**Response:** The mine plan proposes backfilling the mine pit essentially eliminating erosion of the pit wall.
97. **Comment:** Water carried off the mine site through drainage and rainwater can carry with it toxic heavy metals, which pollute the groundwater and river, poisoning the water and killing wildlife.  
**Response:** All contact water generated on the mine site will be routed to the lined contact water basin prior to treatment. Treated water will be discharged per the requirements of the NPDES permit. Similar permits are used to regulate industrial and municipal discharges in the river.
98. **Comment:** An industrial drawdown of the Menominee River, which is a foot shallow in many places, is likely to not only affect the level of the river, but the groundwater table as well. This will impact wells for miles around, the shoreline, and water access.  
**Response:** There is no indication in the application materials that there will be an industrial drawdown of the Menominee River. The applicant intends to utilize mine pit dewatering water and groundwater from water well(s) for needed process water, sanitary water, and drinking water. Based on the water budget analysis and the groundwater modeling, there is no anticipated drawdown impact to the Menominee River. While groundwater modeling does show an anticipated drawdown of the nearby water table, the modeling indicates impact to wells not on property owned or leased by the applicant will be negligible.
99. **Comment:** Concerns with noise pollution resulting from 24 hours a day, seven days a week mining operations.  
**Response:** Operational hours may be set by local zoning.
100. **Comment:** It could be easily argued that Michigan’s mining regulations and enforcement efforts primarily protect mining companies, not public health and the environment.  
**Response:** Part 632 was developed specifically to address special concerns over public health and the environment associated with nonferrous metallic mining.
101. **Comment:** Section 1.6 of the Tailings and Waste Rock Management Facility Construction Quality Assurance Plan state that as part of the Quality Assurance Plan (QAC) the QA Manager ‘will hold a daily progress meeting either at the start of work or

at the completion of work.’ According to Section 5.5.3 Mine Pit Description subsection Mine Equipment Selection, states that ‘two crews will be working 12-hours per shift.’ This is somewhat ambiguous...either there has to be two meetings per day (one for each shift), or one meeting per day (at the end of one shift and the beginning of another)?  
**Response:** The QA Manager is responsible for ensuring the integrity of the facility construction. Daily logs of construction activities will be required and each shift will be responsible for advising the next shift of the status of on-going activities.

102. **Comment:** In determining that the Back Forty Project application meeting the requirements of Part 632, did MDEQ take into account the cumulative effects of sulfide mining throughout Lake Superior watershed?  
**Response:** The Back Forty Project is not located in the Lake Superior watershed; however, Michigan’s environmental laws are protective of all watersheds, and they do address cumulative impacts.
103. **Comment:** The water table and water wells will become contaminated by leaching through the ground.  
**Response:** Proper management of leachate at the Back Forty project, or any mining project, is paramount to the success of a mine. Part 632 was developed to address special concerns surrounding nonferrous metallic mineral mining.
104. **Comment:** The permit application was not written or submitted by the staff of Aquila Resources. They hired Foth, a Wisconsin consulting firm specializing in infrastructure and environmental issues. This would indicate the Aquila Resources has neither the talent nor the skill to construct and publish a permit application that would meet the requirement of MDEQ. Will the MDEQ have to deal with hired consultants and sub-contractors representing Aquila Resources through the construction and operation instead of partnering with Aquila Resources? Does Aquila Resources have the skilled staff, the ability to recruit, train and retain the right people, and purchase the equipment to operate a mine as outlined in the permit application?  
**Response:** Typically once a company gains approval to move forward with mine development they start to develop a team of mining professionals to execute the construction and ultimately the operation of the project. This usually includes sub-contractors that have the requisite expertise in the industry.
105. **Comment:** Can Aquila Resources reduce the visual impact of the mine?  
**Response:** The EIA provides information on visual impacts. Upon reclamation the pit will be backfilled, the surface facilities demolished, and the land returned to a more natural state. The only permanent mining feature likely to be visible to nearby residents is the Closure TWRMF, which will be vegetated, providing it with a more natural appearance.
106. **Comment:** Does granting a permit for an operation such as the Back Forty Mine create a contract between Aquila Resources and the State of Michigan? If so, timely inspection and audit will be required to maintain that terms of the contract are met.

**Response:** By accepting the terms and conditions of a mine permit the permittee agrees to adhere to all portions of the permit.

Part 632 rules allow for the MDEQ to enter at all reasonable times in or upon a mining area for the purpose of inspecting and investigating conditions relating to the operations of a mining area. Part 632 also requires the MDEQ to conduct an inspection of a mining operation at least quarterly to determine compliance with the act and rules. In addition to inspections, the Permittee will be required to submit an annual mining and reclamation report to the MDEQ, as well as report any incident, act of nature, or exceedance of a permit standard or condition at the mining operation that has created, or may create, a threat to the environment

107. **Comment:** The proposed financial assurances are woefully inadequate. The Forest Service requires a minimum of 39% and sometimes as high as 128%.

**Response:** The MDEQ MT concluded the financial assurance presented is adequate. Furthermore, the MDEQ can require adjustments.

108. **Comment:** The mine has the potential to “take” species listed under the Endangered Species Act. If the MDEQ issues permits for activities it knows will result in “take” of listed species, MDEQ is in violation of the ESA.

**Response:** Currently there are no federally listed fish, mussel, amphibian, or aquatic insect species in the Menominee River basin.

109. **Comment:** The applicant has yet to provide a comprehensive plan for light pollution management, including downward direction of light.

**Response:** The applicant provided a light shed survey in their mine application and will employ measures to reduce light pollution.

110. **Comment:** As pit development progresses, groundwater elevations on both the pit side and river side of the wall may drop below the base of the wall, at which point groundwater gradients will not be controlled by the wall. When the cutoff ceases to control “groundwater flow towards the pit” what other measures will be used to control the inflow of groundwater?

**Response:** The slurry cutoff wall between the pit and the river will be keyed into the Precambrian metamorphic bedrock at the proposed cutoff wall location. While there is a hydraulic connection between the metamorphic bedrock and the overlying unconsolidated Quaternary sediments, the hydraulic conductivity of the Precambrian rock is very low. The associated transmissivity is from fracture flow, not matrix flow. For these reasons, it is anticipated that cutoff wall underflow will be minimal. Minimal underflow is desired to relieve stress to the cutoff wall due to hydrostatic pressure. But, if significant underflow should occur, it is common practice to identify and grout bedrock fractures with high water flow at locations upstream of the pit wall.

111. **Comment:** Significant impacts to groundwater and regulated wetlands are projected to extend outside the project area. Therefore, monitoring of wetlands should occur outside the project area, including wetlands beyond the 0.5m contour, to determine whether the projected impact area was accurately modelled.

**Response:** The monitoring plan for the project includes monitoring for hydrologic effects on wetlands.

112. **Comment:** Aquila states that TWRMF leachate will be collected and removed from the site, transported into tanker truck offsite for treatment, from Postclosure Year 7 to Postclosure Year 50 (Mine Year 61). Where will the leachate be treated during those 50 years? Is a treatment agreement in place? If leachate is destined for a municipal WWTP, for example, or another destination in Menominee County, why was this same WWTP option not fully evaluated as a feasible treatment alternative for the NPDES permit?  
**Response:** After the TWRMF is capped Aquila has proposed to continue to treat leachate through the project's waste water treatment plant for a period of about seven years. After seven years, the rate of leachate production will be low enough that use of a tanker for transport to an off-site treatment system will be possible. Regardless of the ultimate disposal method, it will have to meet prevailing water quality and discharge standards.
113. **Comment:** What are the Company's complete long-term plans (Postclosure Years 50-200) for treatment of TWRMF waste leachate? Explain how perpetual care bonding or financial assurances have been calculated to ensure that long-term treatment of Back Forty's TWRMF leachate will be undertaken as required, and not abandoned, endangering groundwater and surface water, or shifted to taxpayers. Is the State of Michigan permitting a Perpetual Care facility?  
**Response:** Fifty years after closure, pumping of leachate from the TWRMF will end. At this time the generation of leachate will be sufficiently small that pumping will no longer be required. Any leachate that impinges on the liner of the TWRMF would remain in the facility.
114. **Comment:** Explain why tailings waste at the Back Forty project cannot utilize plate-and-frame filters and dry stacked tailings technology, and provide documentation showing these techniques were fully evaluated as "feasible alternatives."  
**Response:** During the Project Scoping study, Aquila conducted an alternatives analysis of different tailings deposition processes including high solids content filtered tailings. Based upon that analysis filtered tailings deposition was determined to have sustainably higher capital and operating costs compared to other deposition processes without increasing the environmental benefit due to increased water treatment requirements and fugitive dust emissions. As such Aquila chose not to advance the filtered tailings deposition process for the Project evaluation.
115. **Comment:** How were the sizes of the mussel survey determined? Why are the "search areas" which correspond to the upper and lower edges of the Back Forty Project Area so much smaller than other search areas?  
**Response:** The freshwater mussel survey efforts were conducted in September of 2008 and 2009. The purpose of these efforts was "to determine the status of native mussel populations (Unionidae) at locations...within the Menominee River watershed." The amount of area searched depended on the mussel density observed. If there were few individuals, then the entire length of the transect was searched (total 128m<sup>2</sup>). At sites with

high density, the transect search area was reduced using 0.25m<sup>2</sup> quadrats to allow for “accurate delineation of a smaller search area and more efficient processing of live individuals and shells.” The smaller survey sites had a very high density of mussels therefore search areas were narrowed down to the smaller quadrats (0.25m<sup>2</sup>).

116. **Comment:** What, if anything, is understood about the sensitivity of state endangered *L. recta* and *O. olivaria* (mussels) to ammonia or heavy metals? Explain whether the State expects these state endangered species will be impacted by the Aquila Back Forty discharges.

**Response:** Additional mussel Whole Effluent Toxicity testing is going to be added to the NPDES permit requirements to address any potential impacts to mussels due to permitted surface water discharges. Additionally, a Mussel Relocation Plan was submitted to MDNR to address potential direct impacts to mussels in the area of the proposed outfall location.

117. **Comment:** Explain whether mussel relocation site will be selected without using correlated, site-specific water quality data.

**Response:** The mussel relocation site will not be selected using correlated, site-specific water quality data. All of the proposed relocation site are located upstream of the proposed mine. Water columns in riverine systems are usually well mixed. Therefore, comparisons of water quality between sites would not differentiate good sites from bad sites. Rather, relocation sites will be selected based on the presence of healthy mussel assemblages and suitable substrates. Searches will be conducted at potential locations until a diverse mussel population is located.

118. **Comment:** Is defining a major storm event of one half of the 1-year 24-hour storm event or 1 inch in 24 hours adequate?

**Response:** The 1-year, 24-hour storm event is defined on page 4 of Appendix E of the Mine Permit Application as 2.05 inches depth in a 24-hour period. This value is used throughout the application and is appropriate for the uses to which it was applied. The only location where rainfall depth approaching a value of approximately one-half this depth was found is in Table 2-1 of Appendix F of the Mine Permit Application (Soil Erosion and Sedimentation Control Plan). This table notes that inspection/maintenance of erosion control facilities shall be performed weekly and following storm events of ½ inch depth over a 24-hour period (approximately equal to 25 percent of the 1-year, 24-hour storm event). This threshold is an appropriate value for triggering inspection and maintenance of erosion control facilities.

119. **Comment:** The MPA and draft mining permit include no details on how materials would be transported to and from the mine as required by R425.203. The MDEQ cannot determine whether or not the environment, natural resources, and public health and welfare are adequately protected without information on Aquila’s plans for transportation. There is no information on the capacity of haul trucks or truck traffic. Aquila Resources does not have the authority to upgrade roads without approval of the local government bodies. Unless roads are upgraded to primary road standards, reagents and mill outputs would have to be stockpiled at the mine site during road restrictions.

**Response:** R425.203 refers to transportation infrastructure associated with the transport of overburden, waste rock, ore, and tailings within the footprint of the mine, not transportation of concentrate, ore, or other materials to and from the mining area. The construction and operation of the transportation infrastructure are outside the purview of Part 632. However, other regulations may apply.

120. **Comment:** Feasible and prudent alternatives to minimize actual and potential adverse impacts to natural resources were not adequately considered by the applicant, especially related to mining method (open pit) and on-site processing/beneficiation.

**Response:** The Back Forty Project was designed to minimize actual and potential adverse impacts to natural resources in all aspects of the project, while also taking into account the economics of the mining operation. Within that context, other mine methods and off-site processing and beneficiation were determined to not be feasible and prudent for this project.

121. **Comment:** The applicant's mining plan fails to fulfill legal requirements with regard to the protection of natural resources, particularly in not preventing leaching into ground and surface waters, and with a post-closure approach that fails to create the required self-sustaining ecosystem and which would require perpetual care.

The mine plan fails this standard, contemplating a mine pit that will continue to generate and leach reactive material that must be trucked offsite for at least 50 years, and which will thereafter enter unchecked into the environment for at least another 50 years after that, long after the mine has ceased operations and the site has been "reclaimed."

DEQ rightly asked for more information about this inadequate approach in its May 9, 2016 letter: (MDEQ comment 48: How long will water have to be removed and treated off site after final reclamation?)

Aquila's June response demonstrates that the perpetual care standard has not been met: Schematic 5-4 in Section 5-4 of the Water Management Plan (Appendix D from the Treatment and Containment Plan) shows leachate from the TWRMF will report to the on-site wastewater treatment plant (WWTP) through Postclosure Year 6 (Mine Year 17). From Postclosure Year 7 to Postclosure Year 50 (Mine Year 61) leachate [estimated at 8.70 (year 10) to 2.76 gallons per minute (year 50)] will be pumped into tanker trucks and will be transported off-site for treatment. The estimated leachate generation rate during Postclosure Years 50 to 100 [estimated at 1.22 (year 50) to .58 GPM (year 100)] . . . is extremely small.

The standard regarding perpetual care is NOT that future care be "minimal" or that the amount of reactive leachate entering the environment for the foreseeable future be "extremely small," but that no leachate enters ground or surface water and that no perpetual care be required to achieve that result.

The application falls short in this regard, as highlighted in other "special permit conditions," such as:

O(12). Leachate shall be pumped and treated by the WWTP or other approved system before being released into the environment from the Final Closure TWRMF until such time the volume of leachate generated in the Final Closure TWRMF is determined to reach a rate that can be contained within the TWRMF indefinitely without causing adverse impacts to surface water or groundwater.

And in Aquila's June 2016 response letter, which states:

Water quality in the closed TWRMF was not modeled because water quality during that period would have lower constituents of concern than open conditions. Due to the impermeable cover placed at closure, oxygen levels in the tailings will be reduced resulting in less reactive acid rock drainage (ARD) process. Therefore, worst case condition for leachate chemical concentrations would occur during open conditions. As presented in Response to Comment #48, leachate will be pumped and transported off-site for disposal until Postclosure Year 50 (Mine Year 61).and

Aquila can accelerate the flooding of the pit such that complete flooding of the pit is accomplished within 20 years by adding water from the fresh water supply wells or by adding treated water from the WWTP. . . . Prior to backfilling the mine pit, Aquila will prepare detailed procedures for the backfilling process such that flotation leachate will be not be released into the environment during the backfill process.

The mining permit should be denied as it fails to meet the standards outlined in law for requiring perpetual care.

**Response:** The applicant is not proposing perpetual treatment of water from the TWRMF. Moreover, the applicant is not proposing a closed backfilled mine pit that will generate and leach reactive material that must be trucked off-site for at least 50 years.

122. **Comment:** Applicant fails to provide information necessary to review, let alone verify, that proposed techniques and plans to be implemented are adequate to achieve their intended outcomes.

The long list of cross-referencing and self-referencing "special permit conditions" within the proposed permit – 19 pages of them, with a total of 142 individual requests and requirements -- points to a permit review process that was simply cut short for some reason, and to a permit that should not be granted in its current form. There are simply too many unsubstantiated claims, missing plans, and "special permit" conditions seeking additional materials from the applicant "prior to construction."

The cut-off wall is again a good example of the failures of the applicant and the lax approach taken by the MDEQ in proposing to permit the operation as it stands. The cut-off wall, outlined in only general ways in the proposed special permit conditions, does not meet two key standards from Part 632 and therefore the permit cannot be granted: 1) "demonstrate that all methods, materials, and techniques proposed to be utilized are capable of accomplishing their stated objectives in protecting the environment," and 2) showing that these methods, materials and techniques will "prevent leaching into groundwater or runoff into surface water. These standards, with regard to the cut-off wall, must be incorporated into the permit review process, not permitted and then figured out later.

The cut-off wall is not an isolated example. The applicant simply leaves too much of the actual mine plan up in the air throughout the proposal. There are major components of this application that the MDEQ should rightfully pull into the permit for full public scrutiny, not add after the fact, including but not limited to:

- B(11). Prior to construction, a bat survey shall be conducted in the project area by a qualified biologist. . . . The results of this survey shall be used to assess any potential impacts from mine construction or operations, and measures to mitigate those impacts shall be implemented.

- E (10). Prior to receipt of cyanide to the mining area, the permittee shall prepare a Cyanide Management Plan (CMP) that complies with applicable local, state, and federal standards..
- F(3). Construction of the TWRMF shall not begin until the permittee has provided to the OOGM Upper Peninsula District Geologist revised engineering plans and specifications, and a Quality Assurance and Quality Control (QA/QC) Plan that reflect the requirements outlined in Special Permit Conditions F1 and F5 for the TWRMF liner system, and has received written approval of the plans from the MDEQ.
- F(8). Upon approval by the MDEQ, the plan and specifications for the TWRMF and the operations plan for the TWRMF, including any MDEQ-approved modifications thereto, shall become incorporated into and enforceable under the permit issued pursuant to Part 632 of the NREPA. Final designs and construction specifications, as well as any modifications of, changes to, or deviations from the approved plans and specifications or operations plan, require approval by the MDEQ prior to construction of the TWRMF's.
- F(9). The permittee shall submit all design certifications of liners, covers, and leachate collection systems to the MDEQ and shall not begin placement of ore, waste rock, overburden, or tailings in storage facilities until approved by the MDEQ.
- H(3). The permittee shall submit a full set of WWTP engineering designs to the OOGM Upper Peninsula District Geologist prior to construction. The permittee must designs from the MDEQ before construction of the WWTP.
- H(7). Prior to operations, the permittee shall develop harassment/hazing plan to reduce the use of the CWB's by aquatic birds and this plan shall be implemented throughout operations.
- K(4). The permittee shall submit a plan to the OOGM Upper Peninsula District Geologist to monitor surface water and aquatic biota. The permittee must receive written approval of the plan from the MDEQ before commencement of mining operations.
- K(5). The permittee shall conduct additional surface water quality monitoring and macroinvertebrate and fish community surveys (quantitative and non-wadeable) prior to operations to confirm seasonal baseline conditions for the surface water monitoring locations specified in Special Permit Condition K3. A minimum of four water quality sample results spaced over a period of one year are needed to compare with ambient water quality standards.
- K(20). Prior to construction of the cut-off wall, the final design mix shall be determined by suitability tests to ascertain that the SCB (soil, cement, bentonite) mix will meet the minimum hydraulic conductivity and a shear strength requirement to meet the final design criteria.
- K(21). The permittee shall conduct geotechnical and hydrogeologic testing throughout mining operations to validate the design of the pit slope, Engineering Geology Model (EGM), and design of the cut-off wall. A report of this testing shall be included in the Annual Mining and Reclamation Report.
- K(22). The permittee shall monitor the performance and integrity of the cut-off wall throughout operations by implementing the following as part of the geotechnical g program: (f): If seepage flow exceeds 200 gpm for 5 consecutive days, the

permittee shall notify the OOGM UP District Geologist as soon as practicable, and conduct a review of all cut-off wall monitoring data to determine if the cut-off wall is ineffective for its intended purpose, and submit a report of findings to the OOGM UP District Geologist within 30 days of notification.

- K(23): Prior to mining operations, the permittee shall submit final plans for location and design of piezometers to be installed to monitor the performance of the cut-off wall for review and approval.
- K(24). If the results of monitoring as required by Special Permit Condition K22 indicate that the cut-off wall is ineffective for its intended purpose, the following measures shall commence immediately: a. Implement measures, as necessary, to collect and divert the seepage. b. Determine the locations of leaks based on piezometer and flow monitoring results. c. Commence a site investigation and testing program to assess the integrity of the cut-off wall starting with the suspected location of leak(s), including coring of the cut-off wall for examination and laboratory testing, and inspection of the borehole wall. If necessary, downhole permeability tests may be carried out in the bedrock to further assess their hydraulic conductivities. d. Submit a report of the investigation results and a plan for remedial design and construction to the OOGM UP District Geologist. e. Carry out remedial measures as approved by the MDEQ.
- K(26). The permittee shall install a well nest within WL40 to monitor for impacts that may occur due to mine dewatering. If the groundwater levels in WL40 and/or other groundwater monitoring locations indicate that there is potential for impact to occur to WL40, the permittee shall submit a plan to MDEQ to prevent that potential impact.
- L(16): The permittee shall notify the MDEQ as soon as practical after identifying a leak in the tailings transport system that results in a tailings slurry spill that is not contained by the transport system. An approved corrective action plan shall be implemented by the permittee to include cleanup and any necessary remediation
- M(1): Prior to operations, the permittee shall submit and obtain approval for a finalized SAP that includes the details specific to the project, in accordance with Part 632 rules and conditions of this permit, and as outlined in the Preliminary Quality Assurance Project Plan.
- O(2): Utilizing the data collected in Special Permit E12, prior to commencement of Phase 3 of Reclamation, the permittee shall submit to the department a final design plan for backfilling of the pit, including buffering amendment and procedures for the backfilling process such that leachate will not be released into the environment during the backfill process, for review and approval.

These are by no means the only examples of the “wait and see” approach taken with this proposed permit. The proposed permit drafted by the MDEQ should not be granted. Many, if not all of those items listed above appear to be significantly lacking in meeting the basic requirement that the applicant demonstrate the viability of proposed techniques. Such verification cannot be undertaken on plans that have not been required by the MDEQ or provided by the applicant.

It appears that MDEQ proposes to grant the permit without requiring even basic, common-sense details about what plans and techniques are being proposed, and if they will work as proposed. This is a clear violation of Michigan statute, which states that the

mining, reclamation, and environmental protection plan for any proposed mining operation must include both “a description of materials, methods, and techniques that will be utilized,” and “information that demonstrates that all methods, materials, and techniques proposed to be utilized are capable of accomplishing their stated objectives in protecting the environment and public health.”

The MDEQ should pull back the proposed permit and demand that the applicant address the gaps – many currently listed as special permit conditions – and that new information become part of the official permit application, reconsidered for proposed MDEQ action, and noticed again for public input and comment.

**Response:** The application describes in the mining plan the materials, methods, and techniques that will be used, except that such information may not be required for methods, materials, and techniques that are widely used in mining or other industries and are generally accepted as effective. The MDEQ has determined that the referenced techniques are viable as described in general outline; specific details of implementation depend on information that will be generated through development and implementation of the plans that are outlined. The applicant will not be approved to proceed with the pertinent operations until the required details are satisfactorily identified and described.

123. **Comment:** Overall, the feasible and prudent alternatives analyses contained in the proposal and supporting documentation are woefully inadequate. This is especially true of a major aspect of the project – namely, the choice to create, and later backfill with reactive materials, a large (83 acre) open mine pit on the banks of the Menominee River. **Response:** Underground mining methods are not feasible or prudent for this project due to gaining access to ore located near, and in some locations at, the surface. The placement of waste rock buffered with limestone as backfill in the pit is preferable to and safer than final disposal of the waste rock at the surface and leaving an open pit filled with water. A cutoff wall will be constructed to restrict water from entering or leaving the pit.
124. **Comment:** The applicant provides no true analysis, just a short justification consisting of two short paragraphs (a total of 107 words), and fails to provide even a description of any feasible and prudent alternatives to the chosen open pit mining method. The justification provided primarily serves to explain “general” considerations regarding mining methods. The only project-specific justification for the chosen mining method in the entire EIA is a statement that, “A preliminary assessment of underground mining showed that underground mining is not a prudent alternative for this ore body. The shallowness of the ore body, specifically the shallow ore zones, heavily influences the effectiveness of open pit mining.” This inadequate “analysis” does not stand up to scrutiny. No description or analysis of any alternative approaches (e.g., underground mining via tunnel) is provided, and therefore this cannot be considered a valid “alternatives analysis” under the statute. In addition, the rationale that is provided for dismissing alternatives is based solely on the applicant’s own economic considerations in accessing and removing the ore, not the long-term risks and tradeoffs related to environmental or natural resource concerns.

**Response:** Underground mining methods are not feasible or prudent for this project, because underground mining could not reasonably access the ore located near, and in some locations at, the surface.

125. **Comment:** The state must request and require a full description and analysis of what an underground alternative might be for backfilling of the open pit with reactive materials as part of the closure and post-closure plans. The proposed mining method of open pit, for example, necessitates the construction of a cut-off wall to protect the river, a strategy in itself full of acknowledged uncertainties in terms of effectiveness. The open pit would also need to be flooded to stop ongoing weatherization that creates acid rock drainage (ARD), a process they estimate would take 20 years under ideal circumstances. Even after closure and reclamation, the pit would continue to create leachate that must be trucked offsite for 50 years, and would generate leachate for at least 100 years – the extent of the analysis.

Failing to analyze alternative methods to this approach that might not require the construction of the cut-off wall, or might shorten the period of leachate generation, for example, fails to satisfy the most basic of requirements of Part 632 in terms of “minimizing actual or potential adverse impacts,” and the lack of consideration of alternatives such as underground mining should alone justify a denial of the permit as proposed.

**Response:** See response to comment number 124.

126. **Comment:** Again, the applicant acknowledges that offsite locations were evaluated, but fails to provide any supporting documentation. Moreover, economic considerations (e.g., the profit motives) of the applicant alone are NOT sufficient to dismiss potential alternatives. In this case, we believe that immediately hauling the raw material out of the mine area, adjacent to the Menominee River, to an offsite area with fewer high-value natural resources, warrants a full analysis under the statute as it clearly reduces the “actual or potential adverse impacts” to the natural resource by limiting the overall quantity of ARD-generating materials on site, reduces the total volume of reactive material that must be dealt with, and keeps toxic chemicals such as cyanide out of the equation.

Estimates suggest that the mining operation will produce 54 million tonnes (Mt) of waste rock and an additional 12 Mt of tailings materials that have been processed in some manner. The addition of chemicals and other agents used in processing (including cyanide) also add significantly to the amount of high-risk, reactive and/or acidic-generating materials being dealt with onsite. Therefore, it is prudent to fully consider an alternative project design that relies on offsite processing. In such a scenario, most if not all of these additional processing-generated materials are not ultimately deposited in a backfilled pit on the shores of the Menominee River, and that option must be examined in full.

As stated in the permit application, “Reclamation of the pit is patterned after the successfully backfilled and reclaimed Flambeau Mine in Ladysmith, Wisconsin, and is designed to protect groundwater quality and the Menominee River.” However, as has been noted by other commentators, the Flambeau mine was markedly different than the proposed Back Forty project in that the processing was done offsite at the Flambeau

project. Therefore, the reactive material used in backfilling the mine pit was very different and there was far less of it– a difference whose impact cannot be fully appreciated unless an alternatives analysis is provided that contemplates a scenario in which Back Forty ore is processed offsite. That analysis has not been provided or likely conducted, but should be.

The mining permit should be denied until a full and robust alternatives analysis is conducted and presented which explores actual and potential adverse impacts and risks to the natural resources, particularly the Menominee River and nearby Lake Michigan, of a mining plan in which all post-extraction ore processing is handled at an offsite facility.

**Response:** The MT believes the applicant provided adequate alternatives analysis. The MDEQ does not agree with the commenter that transporting ore to an offsite area would reduce the impacts to natural resources. See the MDEQ response to comment 41 regarding comparison to the Flambeau mine.

127. **Comment:** Part 632 is very clear that the mining plan must “prevent” (common definition: “to keep from occurring”) leachate from entering ground or surface waters. It appears that the Aquila project fails to meet this basic standard, and at a minimum contemplates at least three specific areas of the operation where leachate is created and allowed -- in known, anticipated amounts -- to enter ground or surface waters. These include the stockpiles, the Tailings and Waste Rock Management Facilities (TWRMF), and the proposed but not-yet designed cut-off wall.

**Response:** All reactive waste rock and tailings will be stored in lined areas with leachate collection systems to prevent water quality impacts, by preventing leachate from entering groundwater or surface water. The cut-off wall is being proposed to reduce water movement from the river into the pit during operations.

128. **Comment:** Part 632 state that the mining, reclamation, and environmental protection plan shall include “provisions for the prevention, control, and monitoring of acid forming or other waste products from the mining process so as to prevent leaching into groundwater or runoff into surface water.”

The standard regarding leachate, therefore, is not the degree of contamination from leachate, or consideration of the quantities that would create “adverse” impacts. The standard in statute is that leachate be “prevented from leaching into” groundwater or surface water. The proposal and draft permit fail this standard.

The draft MDEQ permit contains at least three “special permit conditions” that contemplate and plan for leachate entering ground or surface waters:

- E(3): “Coarse ore and concentrate stockpiles shall be maintained to prevent leachate from contaminating the environment.”
- F(7). If the average daily flow rate in the [TWRMF] leak detection system exceeds 25 gallons per acre per day, the permittee shall notify the OOGM Upper Peninsula District Geologist, investigate the leakage source(s), and develop a corrective action plan to address the leakage.
- K(22). The permittee shall monitor the performance and integrity of the cut-off wall throughout operations . . . If seepage flow exceeds 200 gpm for 5 consecutive days, the permittee shall notify the OOGM UP District Geologist as soon as practicable, and conduct a review of all cut-off wall monitoring data to

determine if the cut-off wall is ineffective for its intended purpose, and submit a report of findings to the OOGM UP District Geologist within 30 days of notification.

The proposed cut-off wall, separating the open mine pit (active during operation, and permanent home to the neutralized ARD slurry according to post-closure plans) from the Menominee River, is of particular concern. It appears that the design is not confirmed, and in fact, the many special permit conditions related specifically to the cut-off wall suggest a great deal of uncertainty that the design will be effective.

The cut-off wall design itself – located in such close proximity to the river – does not seem to be the best choice (see feasible and prudent alternatives above). Moreover, the fact that the design for the cut-off wall does not appear within the mine application, but is raised in a slew of “special mine conditions” that will never be vetted by the public prior to construction, raises serious questions.

Additional MDEQ draft permit Special Permit Conditions related to the cut-off wall include:

- K(20). Prior to construction of the cut-off wall, the final design mix shall be determined by suitability tests to ascertain that the SCB (soil, cement, bentonite) mix will meet the minimum hydraulic conductivity and a shear strength requirement to meet the final design criteria.
- K(21). The permittee shall conduct geotechnical and hydrogeologic testing throughout mining operations to validate the design of the pit slope, Engineering Geology Model (EGM), and design of the cut-off wall.
- K(23): Prior to mining operations, the permittee shall submit final plans for location and design of piezometers to be installed to monitor the performance of the cut-off wall for review and approval.
- K(24). If the results of monitoring as required by Special Permit Condition K22 indicate that the cut-off wall is ineffective for its intended purpose, the following may be carried out in the bedrock to further assess their hydraulic conductivities.  
d. Submit a report of the investigation results and a plan for remedial design and construction to the OOGM UP District Geologist. e. Carry out remedial measures as approved by the MDEQ.

We should state clearly: the cut-off wall is not an area where a “trial and error” approach should be entertained.

The mining permit should be denied as it fails to meet the standards outlined in law for preventing leachate from entering ground or surface waters. If the plans for stockpiles, TWRMF, and the cut-off wall, among other items, cannot all be demonstrated to prevent leachate from entering ground and surface waters, then the permit must not be granted.

**Response:** All reactive waste rock and tailings will be stored in lined areas with leachate collection systems to prevent water quality impacts. The cut-off wall is being proposed to reduce water movement from the river into the pit during operations and prevent water moment from the pit after closure.

129. **Comment:** If Aquila Resources is granted a permit to operate the Back Forty Project as an open pit mine, will they perform to the permit application or will they make a claim that there is new information, results, or circumstances that require management to deviate from the content of the permit application?

- Response:** The Permittee is required to comply with the conditions of the Mining Permit, including approved plans in the permit application. A Mining Permit may be amended, subject to MDEQ approval, at any time to address changes in the mining operation, natural or humanmade conditions, or technology, or to correct an oversight, per R425.206 of Part 632 general provisions. The Permittee would be required to submit an application for amendment to include all revisions for MDEQ to review, and any decisions to approve an amendment are required to be public noticed.
130. **Comment:** How many other permits are there that afford protection to natural resources and how do they relate to approval or disapproval of the application permit?  
**Response:** The Mining Permit is not effective until all other permits required under the NREPA for the Back Forty Project are obtained. NREPA permits required for the Back Forty project include Michigan Air Use Permit-Permit to Install, National Pollutant Discharge Elimination System (NPDES) Permit, Wetland Permit, Notice of Coverage for storm water management during construction activities, and Notice of Intent for storm water management during operations.
131. **Comment:** How can the excavation and removal of nonferrous metallic minerals and associated overburden and waste rock not constitute pollution, impairment or destruction of those natural resources?  
**Response:** Part 632 states in Sec. 63205, (11)(b), that excavation and removal of nonferrous metallic minerals and of associated overburden and waste rock, in and of itself, does not constitute pollution, impairment, or destruction of those natural resources.
132. **Comment:** The EIA (Environmental Impact Assessment) studies are so old as to be of little value. Some, if not most, are over a decade old.  
**Response:** Special Permit Condition K5 requires the Permittee to conduct additional surface water quality monitoring and macroinvertebrate and fish community surveys prior to operations to confirm seasonal baseline conditions for surface water. With that addition, the MDEQ finds the EIA to be accurate.
133. **Comment:** The permit application only calls for tire-washing and not full-body truck-washing; therefore the ability to spread this toxic dust increases exponentially.  
**Response:** Given the relatively high moisture content, opportunity for dust to adhere to sides of the truck body would be low.
134. **Comment:** Explosives per the permit application are planned to be blasted at unspecified times without regard for public safety and welfare. There was no provision for the storage of explosives on-site being considered.  
**Response:** As described in the Mine Permit Application, no blasting materials will be stored on site. Certified blasting contractors will bring blasting materials to the site the day of the planned blast.
135. **Comment:** Do not allow any expansion of the mine site area without submission of a completely new permit application with all required data in proper format.

**Response:** A Mining Permit may be amended, subject to MDEQ approval, at any time to address changes in the mining operation, natural or humanmade conditions, or technology, or to correct an oversight, per Rule R425.206 under Part 632. The Permittee would be required to submit an application for amendment to include all revisions for MDEQ to review, and any decisions to approve an amendment are required to be public noticed.

136. **Comment:** Our water tables will be affected by this very deep mine pit.

**Response:** The water table in the mining area will be impacted during the active mining period. Once mining activity has halted, the water table will rebound to pre-mining conditions. Groundwater modeling shows the impact to the water table during the mining activity period will be negligible away from the properties owned or leased by the applicant. The numerical groundwater modeling program, MODFLOW, used by the applicant to develop the site-specific predictive model was developed by the USGS, has been updated multiple times, and has been widely accepted and utilized by academic, commercial, and regulatory professionals worldwide for three decades. Groundwater levels will be routinely monitored on a quarterly basis throughout the life of the mining project with results compared to the model predictions. If there is a significant discrepancy between modeled groundwater levels and actual groundwater levels, the mining venture will be required to reassess groundwater impacts, and if the impacts are unacceptable, the permittee will be required to modify its activities.

137. **Comment:** The blasting events that would take place with this particular mine would devastate groundwater wells for who knows how far of a distance around that particular project.

**Response:** Blasting for mining, quarrying, and road construction activity has been occurring in Michigan's Upper Peninsula for over a century. The MDEQ is unaware of any problems with water wells due to blasting except for a few instances where a water well existed very close (within a few hundred feet) to a blasting area.

138. **Comment:** Some of the chemicals they admit to using have been banned and forbidden by the state already.

**Response:** The MDEQ does not agree that any chemicals proposed to be used for the Back Forty Project are banned or forbidden to be used by the State. However, storage and transportation of any chemicals shall be required to meet federal and state requirements.

139. **Comment:** NPDES Permit fails to set limits for numerous contaminants of concern, including uranium, iron, potassium, phosphorus, ammonia, to name a few.

**Response:** The draft permit does include an effluent limit for total phosphorus and monitoring requirements for uranium and ammonia. Iron is at low concentrations which do not justify discharge limits or monitoring requirements. Limits are developed based on promulgated water quality standards. Several pollutants do not have proposed effluent limits because either the discharge concentrations have no reasonable potential to exceed water quality standards (based on data analysis), or there are no promulgated water quality standards available for the pollutant. Where no reasonable potential

determination was made, or no water quality standard was available for the pollutant, monitoring requirements were included in the draft permit.

140. **Comment:** The MDEQ proceeds to issue a permit that says it's okay to degrade the water and surrounding ecology for financial benefit.  
**Response:** The NPDES draft permit contains effluent limits that are designed to protect water quality by ensuring that water quality standards are met in the receiving water. Water quality standards are numeric and narrative in nature, and are derived to protect human, wildlife, and environmental health. The draft permit also includes Treatment Technology-Based Effluent Limitations to achieve an appropriate level of wastewater treatment performance. The NPDES wastewater permit does authorize the discharge of pollutants that will increase loadings of pollutants which will lower the existing water quality of the receiving waters, but will not lower the water quality below water quality standards necessary to protect designated uses. Compliance with the permit ensures that all designated uses of the receiving water are protected.
141. **Comment:** The withdrawal of millions of gallons of pure, clean water for the mining project is an unwise use of our resources. The water being returned, even after "technologically advanced" treatment will still contain "allowable" amounts of contamination.  
**Response:** The water prior to use and discharge contains some level of background concentrations of certain pollutants. After treatment, the discharge may contain either higher or lower concentrations of these same pollutants. Compliance with the permit ensures that all designated uses of the receiving water are protected, including the industrial designated use.
142. **Comment:** The ordinary high water mark which not would allow Michigan to regulate discharges other than at those times the ordinary high water mark has been met or exceeded.  
**Response:** Discharges to surface waters of the state are regulated under Part 31, Water Resources Protection, of the NREPA. Michigan's authority for NPDES issuance extends to border waters, and is not constrained by the ordinary high water mark.
143. **Comment:** The MDEQ limits the location for discharge point but fails to note a mine this big and this deep being just 75-feet from the Menominee River would in fact have many discharge points that happen as a result of proximity to the river and the amount of precipitation and fluctuating amounts of water entering the mine site and the amount of toxins deposited via dust from the mine that would end up in the river is incalculable and is unaccounted for in this water discharge permit. The public has a right to know this information and we believe once known and applied for in this permit would show the amount of toxic substances entering the river are significantly higher that what the MDEQ has approved and provided for in this permit.  
**Response:** The MDEQ does not agree that there would be multiple points of significant discharge. The installation of a cutoff wall keyed into bedrock will restrict flow between the mine pit and the Menominee River to eliminate groundwater discharge points to the

river. The Permittee will be required to apply dust control measures during construction and operations to minimize dust issues.

144. **Comment:** The MDEQ report does not factor in all the possible chemical reactions that take place through the ground which in essence discharges into the Menominee River.  
**Response:** The NPDES permit does not authorize any groundwater discharges. The installation of a cutoff wall keyed into bedrock will restrict flow between the mine pit and the Menominee River to eliminate groundwater discharge points to the river.
145. **Comment:** Permit No. MI0059945: MDEQ reference to Subrule (4) of R 323.1098 is not only misleading but it is false. The MDEQ has conducted no economic impact study related to this permit. The applicant, Aquila Resources, admitted in a public forum that they did not include the negative impacts of the mine. Any mining job is short lived and Subrule (4) of R 323.1098 does not take into consideration the negative impact to the persons living in the impacted area including decreased property values resulting in lower real estate tax revenue and required additional police, fire and disaster protection. Nor does it take into consideration the documented increase in crime, drug addiction, domestic violence where there is a new mine of limited life as the one that would be here. Nor does it consider the degradation of the health persons living in the impacted area.  
**Response:** Staff of the MDEQ evaluates antidegradation demonstrations based on Rule 98 of the Part 4 Rules. This rule has been determined by USEPA to be consistent with the federal regulations in 40 CFR Part 131.12 and Part 132 regarding antidegradation policy. These rules and regulations do not require precise descriptions on social and economic benefits. Therefore, staff recognizes the review is subjective and open for interpretation. Based on our evaluation, the demonstration meets the requirements of the state rule and federal regulation on antidegradation.
146. **Comment:** The MDEQ appears poised to allow further pollution of the Menominee River by issuing an NPDES permit simply because of a perceived short term economic benefit.  
**Response:** See response to comment #141
147. **Comment:** Why are wetland areas WL-15b and WL-B2 not shown on Figure 1-2 of the NPDES permit application?  
**Response:** Some figures intentionally left out certain details for the purpose of illustrating specific issues.
148. **Comment:** This discharge permit is a De facto permit to dewater the area and will cause irreparable harm to the surrounding area including my property.  
**Response:** The MDEQ has determined the groundwater level will not be adversely impacted by this proposed mine operation.
149. **Comment:** The MDEQ Draft permit fails to state specifically that the 1.52MGD is the maximum allowed to be discharged during a 24-hour period and that this permit would not allow the permit holder to “make up” days where they discharged less. Nor does it

say this maximum would not be changed after the permit is issued. In essence, the 1.52MM GPD being only used for the Draft permit and has no real basis in fact?

**Response:** The term “MGD” is defined in the definition section of the permit as million gallons per day and should not be interpreted differently. Exceedance of the authorized flow would be evaluated by Water Resources Division District compliance staff, to determine if effluent limits are met. Any change to the maximum authorized flow would require a permit modification, and require that the permit proceed through a public notice period. All effluent limits and conditions in the permit would be reevaluated with respect to any requested changes.

150. **Comment:** The Michigan MDEQ should defer any permitting to the State of Wisconsin as they should be the governing body for the Menominee River in this section of the River.

**Response:** The Back Forty Project is located in Menominee County, Michigan, and therefore Michigan has permitting authority. However, MDEQ and WDNR coordinated the review of NPDES and agreed to use the most stringent water quality standards.

151. **Comment:** The highest possible water quality standard for the waste water discharge to the river should be applied.

**Response:** The draft permit contains proposed discharge limits developed using site specific information, including the predicted discharge concentrations, receiving water flow, and background pollutant concentration. The most restrictive water quality standards are used to develop the water quality-based effluent limits for a particular pollutant in the draft permit, and therefore, provide the highest level of protection for human, aquatic life and wildlife, and environmental health. The draft permit also includes effluent limits that meet the state of Wisconsin’s water quality standards.

152. **Comment:** Redundancy of treatment in the wastewater treatment plant is necessary in case the primary system would fail.

**Response:** Many redundancies are incorporated into the design of Wastewater Treatment Plants.

153. **Comment:** The storm water runoff control system should be designed to handle increasing level and amount of extreme precipitation events that are occurring in the Upper Midwest due to the impacts of climate change.

**Response:** The design of all water management systems are conservative and incorporate potential extreme precipitation events.

154. **Comment:** The NPDES clearly states that that their development will pollute the river.

**Response:** Although the NPDES permit would allow for discharge of dissolved constituents, the permitted discharge must meet all water quality standards, and protect all designated uses.

155. **Comment:** There’s no standard for sulfate.

**Response:** Michigan has not yet adopted water quality standards for the sulfate ion. Sulfate is part of total dissolved solids which does have a water quality standard, and is

often used in permits to address concerns related to sulfate discharges. The draft permit contains weekly monitoring requirements for total dissolved solids. The data collected will be evaluated to determine if sulfate will impact designated uses. This approach will continue until when, and if, sulfate standards are adopted.

156. **Comment:** Arsenic is going to be discharged in limits that will impact resources, including wild rice.  
**Response:** The proposed Total Arsenic limits in the draft permit are based on water quality standards that were developed using toxicity tests on animals that are the most sensitive to heavy metals, including arsenic.
157. **Comment:** A detailed wastewater treatment system must be developed and reviewed by experts before consideration of mining and NPDES permits.  
**Response:** Part 632, Rule 203 requires a plan for protecting the environment and public health be submitted with the Permit Application. A plan for the wastewater treatment system was submitted including treatment technologies. The proposed draft permit contains a special condition, H3, requiring submittal of a full set of wastewater treatment engineering design plans for approval before construction.
158. **Comment:** An open pit mine produces potentially unhealthy particulates in the air, sulfuric gases, dust, and odors that can make breathing difficult, aggravate asthma, potentially causing lung cancer, and shortening lifespans.  
**Response:** The regulatory process the MDEQ follows is designed to protect the health and welfare of all citizens of the State of Michigan. To accomplish this, the MDEQ uses the state and federal air quality rules and regulations in place to protect public health and the environment. The federal Clean Air Act (CAA) includes the National Ambient Air Quality Standards (NAAQS) to protect public health. These standards define the maximum concentration of certain air emissions in the breathing zone that would protect the health of the most sensitive individuals, including those with heart, respiratory, neurological and asthma problems.  
The emissions from the proposed Back Forty Project were evaluated and found to meet their respective NAAQS (see Table E of the AQD Fact Sheet for further information). Compounds that do not have an established NAAQS, including arsenic, cadmium, copper, and mercury are referred to as toxic air contaminants (TACs). TAC emissions must meet the applicable MDEQ health-based screening levels as required by Rule 225 (R 336.1225). Screening levels are developed to protect from cancer and non-cancer health effects based on research studies. The best available information is used to establish safe exposure levels and exposure times that are protective against cancer and non-cancer health effects. Harmful health effects are not anticipated to occur over a lifetime of exposure for any pollutant concentrations below these health-based standards. The TAC emissions from the proposed project were evaluated to determine compliance with the health based screening levels. The first step in the evaluation was to compare the TAC emission rates from the project to the Allowable Emission Rates (AER) established in accordance with Rule 227(1)(a) (R 336.1227(1)(a)). If the TAC emission rates are less than the AERs, the TAC complies with the health-based screening level

requirement and no further analysis is required. Emissions of all of the TACs except arsenic, cadmium, copper, and phosphorus were determined to be less than the AERs. The emissions of arsenic, cadmium, copper, and phosphorus from the proposed Back Forty Project were further evaluated using computer dispersion modeling to determine the maximum impacts. These impacts are well below the applicable MDEQ health-based screening levels (see Table B of the AQD Fact Sheet for further information). Note the ambient air impacts from the modeling represent the points of maximum impact, which occur near the facility boundary. The ambient air impacts at all locations farther away from the mine will be lower. Since the maximum impacts comply with the health protective standards, the lower impacts in surrounding areas will also meet the health protective standards.

159. **Comment:** Concern regarding an unexpected industrial accident resulting in air quality discharge exceeding emission levels, particularly in the case of mercury distillation vapors. Should such an accident happen, prevailing westerly winds will jeopardize the health and safety of not only the mine workers, but the local citizens as well. Most of which reside in Daggett and Stephenson where the latter has both an elementary school and high school. An acute event of this type will require the immediate notification of residents and first responders. First responders, most of whom are local volunteers, will require proper training and the protective equipment necessary to deal with any system breach before mine operations begin.

**Response:** The Part 632 mining permit requires the company to prepare an emergency response plan in conjunction with the local first responders before operations begin.

160. **Comment:** If the mine is not properly operated, lead or other heavy metal particles could spread throughout the nearby lands, which would produce long term contamination issues. Air emission permits for this project should require constant monitoring of all emissions for lead and other heavy metals, and require operations to immediately shut down should any air-borne pollutants of this type be detected, and resumption of operations be contingent on proof that the problem is permanently fixed.

**Response:** The low level of expected emissions does not warrant constant air monitoring. The MDEQ used USEPA computer modeling to evaluate the lead and other heavy metal emissions expected from the facility and determined the emissions meet the state and federal health based requirements. In addition, the MDEQ evaluated the deposition impacts of copper, lead, mercury, and zinc and determined emissions from the facility are not expected to have adverse impacts on the land and water near the facility. The air permit contains sufficient emission limits, including opacity limits and opacity monitoring, to ensure the facility operates in compliance with state and federal air quality rules and regulations.

161. **Comment:** Some of the Back Forty tailings waste basins will be permanent, after the mine closes, creating the potential for a long-term wind-borne air pollution.

**Response:** At the end of mining, the tailings will be capped with an engineered cover to prevent infiltration of rain water. This cap will prevent wind-borne air pollution post-closure.

162. **Comment:** The Company does not anticipate wind-borne erosion will be a problem, assuming “98% control due to formation of crust layer on exposed tailings area and remaining moisture in material. Exposure to wind erosion is also reduced by placing tailings in layers between waste rock layers and is below surface of a berm formed by waste rock materials.”<sup>51</sup> Explain the nature of this important “crust layer” expected to form on exposed tailings and virtually eliminate wind erosion of tailings. What is the composition of the crust? If the crust layer doesn’t form, how will the “Wind Erosion (tails)” change? Have calculations been offered to model the anticipated wind erosion of tailings, absent a “crust.”

**Response:** Based on experience with similar materials and the nature of the anticipated tailings to be produced at the facility, the company expects the particles in the tailings material to bond or adhere to each other as the tailings dry out, producing a hard surface or “crust layer” at the surface of the tailings. With this “crust layer”, there would not be any loose particulate material that could become airborne.

If a “crust layer” does not form, the company must still comply with the 10% opacity limit imposed on the Tailings and Waste Rock Management Facilities in the permit conditions. In addition, the revised Nuisance Management Plan for Fugitive Dust requires the company to monitor the tailings facilities for visible emissions and take corrective measures if visible emissions are observed. MDEQ inspectors will also monitor the visible emissions from the tailings facilities when they are on site. With these requirements, emissions from wind erosion of the tailings are not predicted to exceed the rates calculated by the company and verified by the MDEQ.

163. **Comment:** Under General Conditions page 3, number 7, is of great concern. The notice of an abnormal condition, start-up, shutdown, or malfunction that results in emissions of a hazardous or toxic air pollutant which continue for more than one hour in excess of any applicable standard or limitation, or emissions of any air contaminant continuing for more than two hours in excess of an applicable standard or limitation does not have to be provided for up to two business days and written reports for up to 10 days. When will the public be notified? Please address this issue.

**Response:** The commenter is correct regarding the notice requirement in Rule 912 (R 336.1912) under Part 55 of the NREPA. However, the Part 632 mining permit requires the company to prepare an emergency response plan in conjunction with the local first responders. This plan would address notification of the public in the event that there is a risk to public health. The public may not be notified of an abnormal condition, start-up, shutdown, or malfunction that does not result in a risk to public health.

Any notices provided to the MDEQ under Rule 912 would be available to the public through the Freedom of Information Act (FOIA). In addition, if a Violation Notice is issued in response to information provided by the company under Rule 912, it would be available through FOIA as well as the AQD website

[http://www.michigan.gov/deq/0,4561,7-135-3310\\_70317-313032--,00.html](http://www.michigan.gov/deq/0,4561,7-135-3310_70317-313032--,00.html).

164. **Comment:** I don’t understand how a document so incomplete would warrant such an in depth review and a second opportunity to submit corrected information.

**Response:** The MDEQ conducts a thorough review of the information provided by the applicant. If additional information is required to determine if the facility will comply

with the applicable statute and regulations, the MDEQ asks the company to provide the necessary information. There is no regulatory limit on the number of times the company is allowed to provide additional information to the MDEQ so that a complete and thorough review of the application can be done. In this case, the applicant did provide all the information necessary for the application to be complete.

165. **Comment:** The filter agent they are intending to use for their state of the art filtration system is actually a filler used in paint; a flattening agent. This is a trick that's commonly used with people that don't want to use the filter agent they normally would for the Material Safety Data Sheet (MSDS), because a typical MSDS would have crystalline silica, which is a known carcinogen. That would be another one that would have to go on the toxic or contaminants list, along with the other 19 toxic air contaminants.  
**Response:** The AQD does not expect the filter agent to be emitted to the outside air as it will be used inside the facility buildings. Once used, the filter agent will be wet, further reducing the potential for air emissions. Please see Rule 120(f) (R 336.1120(f)) for the definition of a toxic air contaminant.
166. **Comment:** Impact modeling stops at the river.  
**Response:** The computer dispersion modeling evaluated impacts up to 2,500 meters from the center of the proposed facility, which includes land to the west of the Menominee River. Note the maximum impacts occur near the facility boundary and decrease with distance from the facility.
167. **Comment:** The proposal to mine under the river is absurd.  
**Response:** The Permittee is not proposing to mine under any rivers. The permit only allows for open pit mining.
168. **Comment:** The mine is located less than half a mile from the Chalk Hill/White Rapids hydroelectric dams, built in 1927. Michigan has received a grade of D for dam management, and according to the American Society of Civil Engineers, 90 percent of Michigan's 2581 dams will reach or exceed their design life by 2020. No funding is currently available in Michigan to help dam owners repair, rehabilitate, or remove aging dams.  
**Response:** Dam failure was included as a contingency in the design of the mine.
169. **Comment:** The group Save the Wild U.P., as you are aware, has brought scientific evidence to the discussion on whether Aquila's assertions about the safety of their proposal to prevent acid leaching from this operation into the river and groundwater is realistic. Critics say this evidence has been given short shrift by the MDEQ. If true, why is that?  
**Response:** All public comments submitted to the MDEQ have been considered in the review process.
170. **Comment:** My submission to this discussion is that with at least 1.6 million tons of rock to be blasted and excavated in this massive operation, to believe that heavy silting of

this mostly cold and clear river could somehow be avoided, even with the best of precautions, is naive. Fish biologists understand how silt in waterways can ruin spawning beds for game fish such as trout and bass long term, and one has to assume such silting would be disastrous for rare natural sturgeon reproduction in the river.

**Response:** The Permittee will be required to utilize soil erosion and sedimentation measures, including monitoring and maintenance, to prevent erosion from occurring and siltation of the Menominee River.

171. **Comment:** I urge you to delay this fast-tracking of the permit approvals until a formal, actual EIS done independently under USEPA rules, can be performed. I hope the influence of Aquila has not clouded your judgement in this process to ignore the many environmental red flags and the overwhelming opposition of local residents to this mine.

**Response:** The MDEQ processes NREPA permit applications as required in the applicable statutes and rules. A Scoping EIS was developed before the permit application was filed, which included USEPA and tribal input.

172. **Comment:** The sheer size of the permit renders it impossible to review thoroughly in the allotted time

**Response:** The MDEQ assembled a MT consisting of DNR, MDEQ, and SHPO staff with expertise in pertinent areas to review the permit application.

173. **Comment:** Before this permit is approved, the MDEQ need to correct some flaws that appeared in the current permitting and processing of the previous permit under Part 632.

**Response:** The MDEQ processes Part 632 Mining Permit applications as specified in the Part 632 statute and rules.

174. **Comment:** One of the most troubling issues, which I believe is reason enough to deny the permits especially the NPDES permit is the incomplete testing of the water as well as the lack of quantitative analysis in regard to macroinvertebrate periphyton, riparian, macroinvertebrate and aquatic macrophytes and algae sampling. Riparian has already been affected by the upstream dams and will certainly be affected by waste water piped into riparian waters but without thorough testing the effects of this mine can be hidden by lack of complete data.

Table 73-1 shows that testing was only done during the months of July and August 2008 and July and August 2009. Algae, both macro and micro, phytoplankton and zooplankton as any other life form, have seasons of bloom and die off. To accurately determine the presence of these life forms qualitative as well as quantitative analysis and samplings done throughout the year would present a more accurate baseline study. Algae and diatoms are often used in water quality studies to monitor environmental conditions and their presence in greater and lesser numbers is limited by season, habitat and water flow. Without these baseline tests and figures much original data will be lost and unobtainable once mining operations have begun. If short cuts in testing, and undervalued ecosystemic connections are any indication of the business practices and land stewardship of Aquila, then please do not grant these permits to them as it appears to me that they are already attempting to conceal the rate of environmental die off by neglecting ecological population statistics.

**Response:** The draft NPDES permit was developed based on available information. It is not unusual for a facility not yet built to provide this level of wastewater characterization. The draft permit has been revised to include a reopener clause to modify the permit if other pollutants are determined to be of concern based on the results of the ambient monitoring required under the Part 632 mining permit. This comment also addresses a similar comment by the United States Environmental Protection Agency.

175. **Comment:** Their own testing suggests that material with more than 0.3% sulfide will go acid, because there is virtually no natural buffering material (such as calcium carbonate) present in the host rock. All tailings are expected to generate acid, with the exception of tailings produced in year 3 of mining. Additionally, over 75% of the waste rock is expected to generate acid. Yet details of wastewater treatment system to handle this acid are not yet developed. It is imperative to recognize that sulfide mining has a near-perfect record of pollution. There has been NO sulfide mine that has ever been developed, operated and closed without producing polluted drainage from its operations. A detailed wastewater treatment system must be developed and reviewed by experts before consideration of mining and NPDES permits.

**Response:** Part 632, Rule 203 requires a plan for protecting the environment and public health be submitted with the Permit Application. A plan for the wastewater treatment system was submitted including treatment technologies. The proposed draft permit contains a special condition, H3, requiring submittal of a full set of wastewater treatment engineering design plans for approval before construction.

176. **Comment:** The Archaeological Investigation Report for the proposed mine lists at least 22 archaeological sites known to exist on the property. A complete survey of the area has not been done.

**Response:** The applicant has conducted extensive research and archaeological surveys of areas within the Back Forty Project footprint that could be potentially disturbed. To prevent any effect to identified cultural resources, those resources will be protected by 30-meter (100-foot) buffer zones established around the locations to avoid disturbance. Further, the applicant provided an unanticipated discovery plan in the event that additional resources are encountered during Project development.

177. **Comment:** What will the company do with all the lead, cadmium and other heavy metals they mine, crush and process but have such a low recovery amount that a great deal is left but is in a fine particle form that will eventually solubilize by acid generation.

**Response:** The ore from the mine will be processed at the mill. Output from the mill will consist of gold and silver ore bars, and metal concentrates. The metal concentrates and ore bars will be shipped off-site to market. The leftover material from crushing the ore will be placed as tailings in the TWRMF. The TWRMF will contain an engineered liner, leachate collection system, and engineered cover to contain the waste material so as to isolate the tailings from the environment. The engineered liner and cover proposed for this project has been widely and effectively used throughout the mining industry and other industries for waste management purposes.

178. **Comment:** Every endeavor has risk, can the risk be managed.

**Response:** The project was designed to minimize risk to the environment and public health. The approved Contingency Plan is an assessment of risk to the environment or public health and safety associated with potential accidents, including response measures that shall be followed as required by the Mining Permit.

179. **Comment:** There will be a huge hole left behind and will be dangerous to animals and humans.

**Response:** The approved Reclamation Plan will consist of backfilling the mine pit, and reclaiming the Contact Water Basins and non-contact basins. The mine area will be regraded and revegetated to be consistent with pre-development topography. The Mining Permit does not allow for huge holes to be left behind after mining operations have concluded.

180. **Comment:** In previously-submitted comments, we urged MDEQ to fulfill its obligation to thoroughly and objectively analyze all possible environmental consequences of the development of the Back Forty mine, and to make the implications of possibly destroying the elaborate, nationally known sturgeon habitat rehabilitation project in which we've been involved a major part of MDEQ's environmental analysis. We have no confidence that this happened, based on our review of permitting documents, nor do we have any assurances that the Back Forty won't irreparably harm the Menominee River, its people, or the life that it supports.

**Response:** The proposed effluent limits for pollutants in the draft NPDES permit are based on water quality standards that are derived to be protective of water quality for aquatic organisms, including fish species such as the Lake Sturgeon. Information based on aquatic toxicity test results for these pollutants are used to derive water quality standards that protect human, aquatic life and wildlife uses of the Menominee River.

181. **Comment:** Will quarterly water quality measurements be taken? Will they be publicly available?

**Response:** Quarterly water quality measurements will be taken throughout the life of the mine. All documents and reports submitted to the MDEQ are available to the public through the FOIA process.

182. **Comment:** It is stated by Aquila Resources that the Back Forty Mine Project will add mercury to the Menominee River

**Response:** Mercury will not be used in the facility operations but is naturally present in the ore, and in rainfall that falls on site. The treatment system will remove some mercury. Any mercury discharges to the Menominee will be required to meet the water quality standard of 1.3 nanograms per liter, which is the most restrictive water quality criterion for mercury. Please see response for Comment #141.

183. **Comment:** No thorough field survey and inventory of threatened and endangered species has been completed.

**Response:** The results of these surveys were provided in the EIA, and reviewed by MDEQ staff.

184. **Comment:** The permit application does not adequately address sulfate contamination and the cumulative impacts of Aquila's discharge when combined with other sulfate discharges in the area. Sulfate is a pollutant that is routinely found in mine site effluent; it has been shown to impair manoomin growth and success, and at high levels can extirpate it completely. Aquila's ground water model predicts sulfate concentrations increasing over time in its tailings treatment facilities, where values range from 1500-4140 mg/l between years 2 and 7. Aquila's application presents surface water concentrations collected in September 2007, June 2009 and March 2010 and 2011; the Menominee River ranged from 13-34 mg/L and Shakey River ranged from 6.4-42 mg/L. In addition, sites in the watershed with high concentrations of sulfate are found upstream of the proposed discharge, these include: Groveland Mine Outlet (670-790 mg/L), Pine Creek near Merriman, MI (430 mg/L), and Pine Creek near Iron Mountain, MI (390 mg/L). All three sites are approximately 30 miles north of the Back Forty Project area and are all pollutant discharges to the Menominee River from poorly reclaimed historic mining operations. There should be a limit in the discharge permit for sulfate because municipalities downstream use surface water for drinking. For example, the city of Marinette has a drinking water intake near the mouth of the Menominee River. The addition of another source of sulfate combined with existing concentrations would reduce success of any manoomin restoration. In addition, sulfate additions have the potential to impact mercury methylation rates by sulfur reducing bacteria. Once methylated, mercury can enter the aquatic food web, biomagnifying with each successive trophic level. This poses an increased risk to both fish and fish consumers in a region where mercury based fish consumption advisories are ubiquitous. Michigan should consider using a sulfate standard of 10 mg/l – the present threshold where manoomin productivity begins to decline. This standard is used by several tribes with water quality standards as well as the State of Minnesota. The MDEQ should provide a sulfate limit of 10 mg/L and require monthly monitoring as conditions in any discharge permit that may be issued.
- Response:** It is not possible to set defensible sulfate limits in permits without promulgated water quality standards. The proposed permit includes weekly total sulfate monitoring requirements to collect sufficient data to characterize the discharge. If and when sulfate standards are established, the permit will be modified to include limits if determined to be necessary to protect the receiving waters. See response to comment #156.
- The City of Marinette placed their drinking water intake on the Michigan side of the Menominee River outlet to the Green Bay because the general currents along the west side of Green Bay flow north to south. With their intake on the Michigan side of the river mouth, fluctuations to water quality going to their water treatment plant due to river influence are minimized. And, the Michigan MDEQ has collaborated with the Wisconsin DNR on the NPDES permit discharge limits to the Menominee River and is confident the Wisconsin DNR has considered potential impacts to the municipal water supply of Marinette.
185. **Comment:** A concern that there has been insufficient consideration of the cumulative impacts of the pollutants that will be discharged under the proposed NPDES permit. The contaminants that will be released by this project, in combination with the existing

contaminated sediments in the river as well as air deposition, have the potential to cause cumulative impacts to species such as mussels, aquatic invertebrates and sturgeon. These impacts should be considered in further detail and reflected in proposed effluent limits.

**Response:** The potential toxicity caused by additive effect of multiple dissolved constituents in discharges is addressed by whole effluent toxicity requirements in permits. The draft permit includes a proposed acute toxicity limit of 1.0 TU<sub>A</sub> which in combination with individual pollutant effluent limits should be protective of conditions in the receiving waters. In addition, the draft NPDES permit will be revised before being issued to include toxicity testing on mussel glochidia, the early life stage of some freshwater mussels. This early life stage of some freshwater mussels has been found to be sensitive to some pollutants.

186. **Comment:** The State of Michigan takes seriously the development of our resources. They allow companies to take as much of our resources as they can, as fast as they can.

**Response:** The Michigan Department of Environmental Quality promotes wise management of Michigan's air, land, and water resources to support a sustainable environment, healthy communities, and a vibrant economy.

187. **Comment:** The berm & cut-off wall for the proposed Back Forty Mine is engineered to protect against the 100-year storm event and maximum stage flood event. However, the 100 year flood elevation is 211.7 m and is only a few meters below the top of the cut-off wall elevation of approximately 215 m.

This does not instill much confidence since a watershed in northern Wisconsin, not too far from the Menominee River watershed, had an 800 year flood event earlier this year as calculated by the US Geological Survey. Even doubling the mine flood protection to a 200 year flood still leaves considerable doubt that a disaster flooding event couldn't happen. If the river height exceeded the height of the bermed cut-off wall, the water flow over the top would rapidly down-cut into the soil berm and begin filling the pit.

What would a flooded open pit mine look like? Once the breach in the berm was repaired and flow from the river into the pit was stopped, how long would it take to pump and treat an open pit full of contaminated water through the mine's Waste Water Treatment Plant? Or would a flooded pit be declared an emergency, that "mine property was threatened" and the pit water discharged directly to the river without treatment? A legitimate scenario? Look at some of the weather events around the country and the world.

The berm soil is variable consisting of loose to very dense silty sand to sand and gravel with pockets of cobbles. The values from the Standard Penetration Tests (SPT) of the overburden varied from 3 to more than 100 blows indicating the heterogeneity of these soils and the potential for high permeability channels in the soil that can form preferential flow paths through the berm and into the pit. The weathered and fractured top of bedrock below the berm is also a significant conductor of water. Rock armoring and horizontal drainage increases slope stability and decrease the risk of failure due to piping.

Construction of effective cut-off walls is difficult in many subsurface conditions. The cut-off wall is supposed to be keyed to bedrock which is difficult to do effectively. The wall is to be keyed "a minimum of 6 feet into weathered bedrock," but the mining permit application also notes the presence of "ground water seepage from shallow weathered

bedrock” (Vol I p. 20). This implies that a reasonable seal between the cutoff wall and the bedrock may not be achieved. In addition, the July memo from Foth on the wall indicates that the amount of seepage through the wall is 123 to 4756 cubic meters per day (MPA Vol 1D pdf page 331). That is a big range and a lot of water. Additional characterization on the effectiveness of the cutoff wall is needed and analysis of 200 year and 500 year flood events should be conducted to determine if they overtop the cutoff wall and flood the mine site.

The design of the contact and non-contact water basins also do not take into consideration increased storm intensities that are predicted to occur as the climate becomes less predictable. Although these are both sized for “24 hour, 100 year events”, this level of freeboard could be inadequate (Mining Permit Application Section 5.8.2.1). The basins should be designed with greater precipitation intensity tolerances. The minimum freeboard on the contact water basin is most likely inadequate especially given the overtopping and flooding risks mentioned above and noted in the Contingency Plan (IE Appendix J p4 Pdfp280).

**Response:** Aquila initially analyzed flood risk relative to the 100-year flood event and determined that the 100-year event posed no threat to mine facilities. In response to comment from MDEQ provided to Aquila on May 9, 2016, Aquila further analyzed flood risk to mine facilities. The documentation provided by Aquila determined that:

- Only a 100,000-year flood event would inundate the mine area.
- The likelihood of a 10,000-year flood (considerably less than a 100,000-year flood) over a 50-year period is less than 0.5%, i.e., there is a 99.5% probability that a 10,000-year flood event will not occur within a 50-year period and such an event would not inundate any mine facilities.

Sedimentation and soil erosion control measures are required for all berms, and will be monitored and maintained throughout the life of the mine.

Special Permit Condition K22 of the Mining Permit requires monitoring of the performance and integrity of the cut-off wall, and Special Permit Condition K24 specifies measures taken if results of the monitoring indicate that the cut-off wall is ineffective for its intended purpose.

In the unlikely event that a runoff event exceeds the capacity of the CWB’s, excess water will be routed to the composite-lined TWRMF for emergency temporary storage. As an additional contingency, water can be pumped into the mine pit for additional temporary storage of water in the event adequate storage is not available in the TWRMF.

188. **Comment:** The mining, processing and waste from metal sulfide minerals has degraded watersheds and ecosystems nationally and globally over decades and centuries. The risk for acid rock drainage (ARD) is very high at the proposed Back Forty mine since the minerals in this particular geologic setting, particularly pyrite, are very reactive. Most mined material at this mine contain sulfides, and there is very little natural carbonate for buffering. Testing suggests that material with more than 0.3% sulfide will go acid, because there is virtually no natural buffering material (such as calcium carbonate) present in the host rock. All tailings are expected to generate acid, with the exception of tailings produced in year 3 of mining. Additionally, over 75% of the waste rock is expected to generate acid. The ores of this proposed metal sulfide mine are identified by

Aquila as containing high levels of sulfide, mercury and arsenic the mining of which can produce acid rock drainage and arsenic contamination which is lethal to fish and other aquatic organisms.

There are two major long term sources for ARD after mining stops: the oxide WRTMF and the backfilled pit. Leaving the Oxide WRTMF on the surface indefinitely is not acceptable. As shown by many aging landfills around the country, it is only a matter of time before the Oxide WRTMF cap will leak. Precipitation will cause surface runoff erosion and numerous other natural forces will work to compromise the cap's integrity including burrowing animals, tree roots, wind erosion, differential settling of the tailings and the freeze / thaw cycle in the soil all will work to break down the cap over the tailings. These natural forces will lead to progressively increased seepage into the tailings and increased generation of contaminate laden leachate. All capping systems eventually leak.

The process of deterioration of the WRTMF cap and a corresponding increase in seepage through the tailings may not take place until well after the 30 year monitoring period. Just about the time the TWRMF cap deteriorates, the 30 year monitoring period will be over. It is extremely difficult to stop or even slow down ARD unless a new cap is placed over the tailings and moisture cut off before cap deterioration. Closure of the Waste Water Treatment Plant (WWTP) is based on the assumption that "leachate generated by the (merged) TWRMF will be *de minimus*". This will depend on the permeability of the closure cap over the tailings facility

The leachate generated by a leaky tailings dump cap will eventually go untreated because the water treatment plant will eventually be decommissioned. The sulfide bearing waste rock and tailings DO NOT lose their potential for creating ARD with time – this landfill will remain potent forever. It is acknowledged in the MPA the leachate will be strong .. "The Oxide TWRMF leachate may have high constituent load, which may require additional treatment processes prior to receiving at the CWBs." (Vol. I Sect. 5.7.9.5, page 36) Instead of "additional treatment prior to CWB", the contaminated leachate after the WTP is decommissioned will presumably make its way into the Menominee River and Lake Michigan unabated long after Aquila is gone. This would be a case of the MDEQ accepting responsibility for creation of a Perpetual Care situation which is forbidden by the Part 632 Rules.

Since no cap will last perpetually, the only way to avoid a Perpetual Care situation is not to create it in the first place. Understanding that not all waste rock can go back into the pit due to expansion of the rock caused by bulking, the minimum goal should be to leave no tailings on the surface.

**Response:** Materials placed in the Oxide TWRMF, Flotation TWRMF and backfilled pit will be amended with limestone or otherwise treated to provide for moderation of pH levels in the storage and disposal facilities. Monitoring and maintenance of the cap will be required throughout the post-closure period, and MDEQ staff will monitor the performance of the cap throughout this period. The engineered systems that Aquila has proposed for containment of the tailings and treatment of water are widely used in the mining industry and other heavy industry, and have been effective at protecting water resources.

189. **Comment:** Once the in-pit water table reaches equilibrium with the surrounding natural water table, ground water flow will resume towards the Menominee River and Shakey Lakes area and dissolved metals will follow the natural ground water flow routes. As stated in the Golder Pre-Feasibility Pit Slope Design Report, overburden ground water flow appears to be radial centered on the location of the proposed pit ( Sect. 2.4, Plate 9). *“The estimated flow directions within the unconsolidated formations are generally with horizontal flow components...towards the Menominee River and east and south towards the Shakey River and Shakey Lake drainage system (ERM, 2010).”* This would imply that the sulfide waste rock and tailings have the potential to leach ARD into the surrounding aquifers and water bodies for some long undetermined time after mine closure. Buffering agents must be used and applied correctly. For a limited time this can help minimize ARD but probably not in the long term.
- Response:** Once the backfilled pit is saturated, the backfilled waste rock and sulfide minerals present within it will be cut off from exposure to atmospheric oxygen, which will reduce the long-term weathering of the waste rock. The Mining Permit requires the Permittee to amend the tailings and waste rock with limestone, and the proposed plan includes adding additional limestone in the backfilling process (Special Permit Condition E11). The Mining Permit also requires the Permittee to conduct ongoing characterization of the geochemistry of the pit wall rocks, ore, waste rock, and tailings throughout construction and mining operations to calibrate and adjust the model and predictions of reactivity (Special Permit Condition E12). This information shall be used to adjust the addition of buffering amendment to waste rock, tailings, and backfill so that pore water and TWRMF leachate will be maintained at circumneutral pH.
190. **Comment:** The project proposes to mix limestone in with the waste rock backfill to buffer the backfill (MPA Vol 1 Section 5.3.4) but does not clearly describe how that will be blended or the source or transportation for that material. In addition, the sulfide mineralized zones have major pyrite concentrations. Pyrite is known to be a major source of acid generation and dissolved metals causing acid rock/mine drainage (ARD) yet pyrite is not an economic mineral. While the economic minerals will be processed and removed, the tailings and unprocessed waste rock can have significant amounts of pyrite and, along with other sulfide minerals, will be dumped directly into the tailings and waste rock management facility (TWRMF).
- Will the waste rock and tailings be managed by limestone buffering in the both the TWRMFs and again a second time when placed into the pit during backfilling? Please confirm these materials will be limestone treated twice. If waste rock is only treated for backfilling, the acid producing rock will have over 7 years on the surface in the WRTMF to get the acid producing reaction underway since it will be exposed to air and moisture in the TWRMF. Please confirm the double treatment of the acid producing rock.
- For the limestone to have a chance to be effective at buffering the sulfide minerals, it has to be applied uniformly with a small particle size. Limestone aggregate cannot be used because it develops a reaction coating on the outside (armoring) of the individual limestone pieces that seals off the great majority of the buffering limestone on the interior from reacting with the acidic solutions. One approach to this is to use a ground lime.
- To be conservative, if the recommendation is to apply one mole of lime alkalinity to each mole of sulfide acidity, higher amounts of material should be applied, considering: a)

there will likely be preferential pockets of reaction that consume limestone (or lime or other buffering material) quickly due to ground water flow preferred channels and other phenomena, and other pockets that may not begin to react for several years; b) enough buffering material needs to be placed so that plenty is available for countering slow reacting pyrites.

Also, please discuss how alkaline material will be introduced into the pit backfill AFTER the pit has been capped and revegetated if limestone placed with the backfill is not adequate to consistently produce a neutral pH and precipitate metals in order to prevent ARD for 30 years in the short term and hundreds of years in the long term.

Trace elements that are likely to be a concern even with neutral pH pore water include: antimony (Sb), arsenic (As), selenium (Se). Given the potential for Sb, Se, and As to mobilize under neutral conditions, monitoring will need to occur at the TWRMF leachate sumps and at monitoring wells on and around the backfilled pit.

**Response:** The Mining Permit requires the Permittee to amend the tailings and waste rock with limestone, and the proposed plan includes adding additional limestone in the backfilling process (Special Permit Condition E11). The Mining Permit also requires the Permittee to conduct ongoing characterization of the geochemistry of the pit wall rocks, ore, waste rock, and tailings throughout construction and mining operations to calibrate and adjust the model and predictions of reactivity (Special Permit Condition E12). This information shall be used to adjust the addition of buffering amendment to waste rock, tailings, and backfill so that pore water and TWRMF leachate will be maintained at circumneutral pH. Groundwater quality monitoring will continue during the postclosure monitoring period with compliance and leachate monitoring wells constructed for both the backfilled pit and the Final Closure TWRMF, including analyzing for antimony, arsenic, and selenium.

191. **Comment:** As an engineered system, the WWTP is an opportunity to exert a conservative and environmentally responsible approach.

The waste water treatment system (WWTP) appears to be a basic lime treatment system to raise the pH and precipitate metals (Mining Permit Application Section 5.7.9.5). Some areas to consider with regards to the waste water treatment plant: will the WWTP adequately treat leachate, whether the expense of filtering and trucking out wastewater solids has been adequately considered, and whether the WWTP will need to remain on site post-closure to treat TWRMF leachate.

There are waste water treatment systems commonly in use today that can remove the pollutants including metals from the Back Forty waste water. The Back Forty water treatment system could be at or near zero pollutant discharge – this is technically feasible and the equipment to do this is being used in many places. We should demand it and the MDEQ should require it. Thousands of pounds of toxic and polluting metals will be permitted .... PERMITTED!! to be discharged into the river over the life of this proposed mine. Zero discharge is attainable but the use of best available technology is not happening! Why can't an operation that is mining a metal deposit worth \$Billions of dollars afford to use the best available technologies? This *should be* a "Cadillac" water treatment system.

**Response:** Permit requirements must be applied consistently for all discharges. The draft NPDES permit includes promulgated federal Treatment Technology-Based Effluent

Limitations (TTBELs) for mining discharges, based on New Source Performance Standards specified in §440.104(a). Meeting water quality standards in the Menominee River based on existing water quality criteria, and meeting TTBELs based on new source performance standards are protective of the surface water resource for all designated uses.

192. **Comment:** The permit for discharging waste water to the surface waters of the state is the NPDES – National Pollutant Discharge Elimination System. It almost sounds like the Clean Water Act, as delegated to the State of Michigan by the E.P.A., is attempting to eliminate pollutants. Yet, under Michigan’s authority and jurisdiction, it is proposed through a Michigan NPDES permit that this mine be allowed to discharge tons of pollutants into the Menominee River over the short life of this mine. Again, there is technology in common use today that could substantially reduce this pollutant loading. In addition:

- NPDES Permit fails to set limits for numerous contaminants of concern, and
- NPDES Permit limits do not reflect Cumulative Impacts to the river; - important because the mine site has upstream water-impacting industries now and in the past, and
- Pretreatment of Oxide TWRMF leachate description is vague and defers to final engineering for details. How will MDEQ assess this facility after the issuance of a permit?
- Effluent monitoring should be conducted at the outfall location and not somewhere within the discharge line. Additionally there is no mention of surface water monitoring in the river. There are no references to a mixing zone or plans for sampling at mixing zone location.

**Response:** After permit issuance, MDEQ compliance staff will continue to work with the permittee to assure compliance with the effluent limits, monitoring, and conditions specified in the permit. Ambient surface water monitoring requirements have been included in the Part 632 mining permit.

193. **Comment:** An antidegradation demonstration appears to allow a project or activity that creates economic benefit be allowed to degrade water quality in exchange for that economic activity. Isn’t this the opposite of the purpose of the MDEQ? It has been our understanding that the mandate given to the MDEQ by the State statutes is to *prevent* environmental degradation by commercial activity – not reward it. Water is our life blood - those who are willing to risk the water quality of future generations in exchange for an increased level of monetary affluence now are morally bankrupt.

**Response:** This proposed mine when in compliance with the permit requirements will meet water quality standards and be protective of the designated uses of the receiving water. Please see response to Comment #145 regarding antidegradation.

194. **Comment:** The process will generate quite a large amount of sludge. Aquila proposes to put the sludge through a filter press to remove water, then truck the filter cakes off site. Where is the company intending to send WWTP waste material, and where will it be stored on the site? What is the final destination or disposal method/site for the sludge & other mine waste? Have the costs of filtering wastewater and trucking the waste solids

material to a municipal and/or a hazardous waste landfill been properly verified and built into post-closure costs and Financial Assurance?

**Response:** The Permittee will be required to store and transport waste water treatment sludge in a manner that is consistent with any other industrial site in Michigan, and in accordance with state and federal regulations.

195. **Comment:** Because the geologic structures and discontinuities that daylight in the pit walls are vertical or sub-vertical, there will be a direct hydraulic connection between the pit and top of bedrock, to overburden aquifers and to surface water features. *“the river has the potential to provide additional ground water inputs to the pit both through overburden flow and via fracture flow...”* and *“...the occurrence of open (or more permeable) shear/fault zones may bring substantial amount of ground water* (document # 22060, C-1, Executive Summary). These are some of the many statements in the MPA that refer to potential conduits in the bedrock that could bring water into the pit.

There are also engineering requirements for keeping the water bearing structures (faults, shear zones, major joint sets) drained so as not to develop water pressure (pore pressure) in the bedrock near the pit:

*“All structurally controlled failure modes are aggravated by water pressures within the slope, particularly toppling failures. Pore-pressure monitoring behind the pit slopes can confirm adequate depressurization or the need to enhance natural drainage.”*

If the rock mass discontinuities like fractures, faults and shear zones are kept dewatered to minimize pore pressure and maintain slope stability, then these drained discontinuities will result in increased flow from hydraulically connected water sources towards the pit. So if a dewatered fault or shear zone that is connected to the pit intersects an aquifer or a wetland or the bottom of a lake or stream, that fracture can potentially drain an aquifer or a wetland or a lake or stream. How far from the pit have the geologic structures been confirmed or projected by Aquila and which wetlands or surface water bodies lie over these water transmitting geologic structures. There seems to be a trade-off between pit slope stability and drawdown of the local water table and surface water.

After mine closure, the hydrologic connection between the pit and the river and other surface water bodies indicates that once the pit is backfilled, there is the potential for contaminants to flow from the pit to the river and surface water bodies. Given the high pyrite content and the potential for ARD in the pit, the long term impacts of pit water on the Menominee River and downgradient surface water should be fully investigated.

**Response:** Remedies for the potential issues raised in the comment with the two quotes taken out of context from the Executive Summary of the Pit Slope Design Pre-Feasibility Report are addressed later on in the same Executive Summary document. The potential remedies were explored in subsequent work and the conclusion reached and expressed elsewhere in the application materials was that a slurry cut-off wall would be needed between the pit and the Menominee River. It is further stated in the application documents that any other pit slope stability remedies such as grouting of fractures or installation of drains would be utilized if the need arises during mining activity. Based on observations made at other open pit mining ventures in the Upper Peninsula and on the predictive groundwater model developed by the applicant, the MDEQ believes pit slope stability actions will not result in excess draining of regional aquifers. While the groundwater model predicts some nearby wetlands will be impacted by pit dewatering,

the MDEQ will require the applicant to mitigate those impacts if they receive a wetlands permit; and the mining permit will not be effective until all other permits (including wetland permit(s)) are issued. As indicated in the application materials and required by the draft Part 632 mining permit, there will be a number of groundwater monitoring locations all around the active site. If monitoring data indicates significant impact to the water table over and above what was predicted by the groundwater model, the permittee will be required to modify activity to minimize impacts.

Most of the bedrock core from exploration and rock stability assessment drilling in the proposed active area and the surrounding region were evaluated for fracture features. As indicated in the application materials, most fracture features in the Precambrian bedrock appear to be discontinuous with extremely low hydraulic conductivity. A small percentage of the features identified in borehole core and by geophysical logging do transmit water, and will be addressed as needed during the mining activity.

The bottom of the cutoff wall keyed into the bedrock will be much lower than the bottom of the Menominee River and any high sulfide containing water accumulating in the pit post-mining would be denser than overlying fresh recharge water, thus inhibiting the upward mobility of mineralized groundwater to the river. This concept of mineralized denser water being kept from upward mobility by less dense and less-mineralized fresh water above it has been utilized in other closed mining ventures such as the White Pine Mine and has been proven to be reliable. Additionally, backfilled waste rock will be submerged and contained within the low-permeability unweathered bedrock, minimizing groundwater migration and preventing mineral oxidation and ARD.

196. **Comment:** As stated in the Golder Pre-Feasibility Pit Slope Design Report, overburden ground water flow appears to be radial centered on the location of the proposed pit ( Sect. 2.4, Plate 9). *“The estimated flow directions within the unconsolidated formations are generally with horizontal flow components...towards the Menominee River and east and south towards the Shakey River and Shakey Lake drainage system (ERM, 2010).”* The ground water cone of depression created by dewatering this proposed pit and the geologic structures will be large and irregular. It is certainly conceivable that disruption of the ground water flow towards the south and southeast in the unconsolidated formations could also dewater or at least drop the water table in the Shakey River and Lakes area. Will this be monitored well away from the pit and are there contingency plans in place for dealing with the potential dewatering of these important natural habitats and economically important recreation areas?

**Response:** The comment regarding the location of the radial groundwater flow is incorrect. Groundwater flow is not radially centered at the location of the proposed pit. The proposed pit in its entirety is located to the west of the groundwater divide that transects the area. The radial center shown in the referenced figure, Plate 9 of the Pre-Feasibility Study is located several hundred feet to the east of the proposed pit location. While it is correct the cone of depression from dewatering for this project will be large and irregular in shape, it is incorrect to presume it will impact the Shakey Lakes area. Groundwater flow to a discharge point, such as a surface water body, a well, or a large drain like an open pit mine, always moves from points of higher potentiometric surface elevation to points of lower elevation. Based on the groundwater elevation surfaces from the Hydrogeologic Investigation Reports contained in the application materials,

groundwater contribution to the pit area is generally from the east-southeast. Referring to Figure 5-5 from the Groundwater Modeling Report, the expected extent of the drawdown cone-of-depression is a mile north of the northern edge of Shakey Lakes. As such, there should be no impact to the Shakey Lakes.

Monitoring of groundwater elevation levels will be a permit requirement. If measured groundwater levels are significantly different than the levels predicted by the groundwater model, the permittee will be required to remodel the groundwater environment with the updated information, assess impact to outlying areas, and potentially modify activity to minimize impacts negatively affecting local environmental and economic concerns.

197. **Comment:** We have concerns about the aggressive pit slopes and the marginal Factor of Safety for these pit slopes. Because there can be a significant margin of error associated with predicting geologic conditions in complex geology like the northwest and southwest pit walls where there are geologic structures – water transmitting faults, shear zones and broken weak rock which should translate into a conservative mine design. This means utilizing a high Factor-Of-Safety in the design and choosing perhaps more expensive but effective design criteria. A pit wall design Factor of Safety (FS) of 1.3 does not properly reflect the inherent uncertainties of geologic data. The factor of safety can be greatly affected by fractures, faults, weathering, ground water, and many other factors found in the subsurface at the Back Forty.

If the pit slope is beneath haul roads or important infrastructure, the factor of safety should go up to 1.5 or more depending on the analysis. Would the predominance of near vertical rock mass discontinuities at the Back Forty plus the presence of a major river with a cutoff wall at the Back Forty argue for a higher more conservative FS? Is the cost of a pit slope failure on the west-northwest side near the river included in the Financial Assurance?

**Response:** The pit slope design is based on industry-standard geotechnical investigation methods, design practices, and safety factors. As such, the pit design does not pose unique risks. Geotechnical conditions will be monitored during construction and standard engineering controls will be applied to maintain stable pit walls. Permit conditions require the Permittee to conduct pit slope monitoring actions and assess slope stability during mine operations. The MDEQ may require the financial assurance estimates to be updated, as determined by conditions at the mine.

198. **Comment:** The permit application materials indicate that the post closure period would be 20 years (MPA Vol 1 Page 7). However there are features of the proposed mine that would require maintenance and monitoring far beyond that 20 year time period, such as the tailings basins and the backfilled pit. Tailings, waste Rock and the mine pit have acid generating potential. Even if the applicant adds lime to keep pH neutral there is the potential for leaching of metals. The backfilled pit and the tailings and waste rock facility would become permanent features of the landscape and because of their acid generating potential, would need to be monitored in perpetuity. The EIA indicates that the tailings “cap and cover system will be regularly inspected and maintained to maintain integrity” (II p27 Pdfp37) and this will need to continue after 20 years, yet no description of long term maintenance was found. In time, large trees can become established on the tailings

and waste rock facility, the roots could destroy the cap integrity and perpetual management of the facility vegetation is necessary. The tailings basin composite cover and embankments are not maintenance free and no engineered structure will last forever. Mining facilities requiring such “perpetual care” are not permissible under Michigan law (R425.204, R425.409).

Retaining acid-generating material on site at Aquila’s Back Forty will likely require diligent water management of TWRMF leachate in perpetuity and may require in-perpetuity water treatment. Management of the water quality in the pore water within the backfilled pit particularly after water table equilibrium is also necessary. These need to be considered in financial assurance

**Response:** At the end of mining, the mine will be backfilled and the surface infrastructure will be reclaimed and revegetated. The tailings facility will be capped and revegetated. Aquila has estimated that after capping it will take approximately 50 years for tailings pore water to drain from the capped tailings to the leachate collection system. During this period of time, leachate will be pumped from the facility and treated on site or at a local POTW. The plan for management of the closed tailings facility is similar to what occurs at many municipal and industrial waste facilities across Michigan and does not constitute perpetual care following closure.

By constructing the tailings facility with a composite liner and then capping the facility with a composite cap, oxygen penetration in the tailings and water percolation into the tailings will be eliminated so the facility will not be perpetually generating acid. Permit conditions also require the amendment of tailings with buffering material.

Likewise, backfilling the pit with waste rock and limestone and allowing the water table to fully saturate the backfilled material pore space will eliminate oxygen penetration into the backfilled waste rock so the facility will not be perpetually generating acid.