STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY
UPPER PENINSULA DISTRICT OFFICE

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May 9, 2016

Mr. Andrew Boushy, Vice President – Project Development
Aquila Resources Inc.
E807 Gerue Street
Stephenson, Michigan 49887

Dear Mr. Boushy:

SUBJECT: Request for Additional Information – Aquila Resources Inc. – Back Forty Project Mine Permit Application

The Michigan Department of Environmental Quality (MDEQ) Mining Team has conducted an initial review of the Back Forty Project Mine Permit Application (MPA). The application was submitted to the Office of Oil, Gas, and Minerals of the MDEQ on November 12, 2015, by Aquila Resources Inc. under the requirements of Part 632, Nonferrous Metallic Mineral Mining, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (NREPA) (Part 632). Public comments received during the public comment period were taken into consideration as part of the initial review.

The Mining Team has identified a number of areas where additional information and clarification is necessary in order to complete a comprehensive and accurate review of the MPA. Part 632 allows for the request of additional information to supplement, clarify, and support the project activities proposed in the MPA. Please respond by addressing the following:

Mining Plan

1. Figure 2-2, Volume I: Overall Project Timeline: When will the construction of the cutoff wall take place?

2. Section 5.3.4, Volume I: Additional geochemical test work will be conducted to further evaluate the amount and type of buffering material that will be added during backfilling process, which will be prepared prior to reclamation. What types of buffering material are being considered? How will the type of buffering material affect volume capacity of the pit and Tailings and Waste Rock Management Facilities (TWRMFs)? Provide a plan for ensuring pore water in the backfilled pit and leachate in the TWRMFs (including the closure TWRMF) is buffered at circumneutral pH.

3. Ore segregation piles will be temporarily stored in partially covered buildings (after crushing) on a concrete pad with drainage. What is the water management plan in this part of the contact area?

4. Where will "super sacks" of concentrate be temporarily stored and loaded onto trucks?

5. What is the proposed water source for vehicle tire wash?

6. Clarification is needed as to what roads within the mine area are to be gravel or bituminous. It is not clear on Figures 2-1 and 2-3.

7. What is the proposed dust suppression water source?

8. How will the "dead storage" (sediment thickness) in the Contact Water Basins (CWBs) be measured, and subsequently removed if necessary? Since the CWBs are proposed to be monitored monthly, how will this be accomplished in winter months? The design capacity of the CWBs took into account 1.0 feet of sediment storage. The Monthly Schedule for Inspection and Monitoring of Maintenance of Mine-related Facilities (Table 5-8) includes plans to remove sediment once the thickness is 1.5 - 2.0 feet. Since sediment may not accumulate evenly throughout the CWBs, clarify as to what will prompt sediment removal actions.

9. How long might material be stored on the Ore Blending Area (OBA) during operations?

10. How was a thickness of 1.0 feet of reinforced concrete for the OBA determined to be adequate?

11. Explain the design of the water collection sump for the OBA.

12. All ditches conveying contact water from the ore storage area will be surfaced with bituminous concrete. Will all contact area ditches be surfaced this way?

13. Section 5.8, Project Water Management Plan: "As necessary, fresh water will be used as make-up if sufficient reclaim water is not available. The source of fresh water will be from a potable water well(s) located on site." What is the estimated amount of fresh water expected to be needed as make-up? Is this expected to be necessary during certain times of year? Note that an RPZ (Reduced Pressure Zone) will be required on the potable water make-up line.

14. Geochemical Investigation Report, Volume IA-IC, Appendix B, Section 3.1.3: Tailings samples preparation (bench scale testing of milling technologies) – Oxide

and flotation beneficiation processes are proposed in the Mining Plan. Describe what milling technologies were applied to prepare tailings samples for kinetic testing, or specify where this information can be found in the application.

15. Geochemical Investigation Report, Volume IA, Section 4.4.4: How does the calculated surface area of the kinetic samples correlate with the expected size distribution of the tailings and waste rock material to be stored in the TWRMF's?

16. Provide a cyanide management plan.

17. Provide a design plan for the tailings pipeline, including locations of dump ponds, dump pond capacity, and how they will be lined.

18. Demonstrate that the dewatered tailings, as proposed in the application, can be pumped during seasonally colder temperatures.

19. Figure 5-1: Explain the "Topsoil Stockpile" labelled on the Menominee River.

20. Provide a plan to minimize impact from surface facility lights.

21. Provide a plan for snow storage during the winter months on the contact area.

Pit Slope Design, Volume ID, Appendix C

22. Provide clarification or an explanation as to how the proposed monitoring plans take into account the recommendations for geotechnical documentation and monitoring, specifically pit documentation during pit development, slope monitoring, surface displacement monitoring, water-level monitoring, monitoring of piezometric pressures in the northwest and southwest areas of the planned pit, and blasting-related monitoring.

23. Groundwater seepage through the cutoff wall is estimated to be 123 to 4756 m3 per day (32,500 to 125,500 gpd – 22 to 87 gpm). During life of mine (LOM) further seepage analysis will be carried out in the ongoing project hydrogeological evaluation (p. 4, Volume ID, Appendix D). What are the specific plans for this analysis? How will seepage through the cutoff wall be monitored?

24. How were the operational considerations listed in Section 6, p. 41-46 taken into account in the proposed mine plan?

25. No additional geotechnical investigation was carried out since 2010, and no new piezometers were installed in the pit area (Comment on the application of the 2011 Pit Slope Design to the 2015 Pit Shell for the Aquila's Back Forty Project,

Technical Memorandum October 15, 2015, Golder). Since it is stated that no additional geotechnical investigations were carried out, explain how the considerations listed in Section 7, p. 46-47, that were offered for additional geotechnical studies to further advance the Back Forty pit slope design, were considered in the development of the mine, reclamation, and monitoring plans.

26. Section 3.0, (Final Remarks Comment on the application of the 2011 Pit Slope Design to the 2015 Pit Shell for the Aquila's Back Forty Project, Technical Memorandum October 15, 2015, Golder) -- "As the project advances beyond the Pre-Feasibility Study, it is recognized that additional effort is required on the evaluations of the minimal set-back distance to the river and what should be done to control potential seepage through the OB and upper BR surface into the pit. Further investigation is also required to assess for potential major geologic structures that could provide hydrogeological connection between the river and the pit." – How were geotechnical evaluations applied to determining the minimal set-back distance to the river for the proposed mine pit design? What plans are in place for further investigation to assess for potential major geologic structures that could provide hydrogeological connection between the river and pit? If major geologic structures are found to exist, what will the implications be for the mine pit design and the cutoff wall design, and how will they be mitigated?

Cutoff Wall Design, Volume ID, Appendix D

27. The CSM (Cutter Soil Mixing) method was determined to be best suited for the Back Forty Project. Is this the method that is proposed? Provide a plan for placement/control of soils/bentonite slurry removed from the trench in preparation for the possibility that the TC (Trench Cutter) method may be utilized.

28. Figure 1 – Distance shown on the map on the west side of the pit shows cutoff wall 28 meters from the river. Explain how this meets the proposed cutoff wall setback of 100 feet from the river ordinary high water mark.

29. Preliminary seepage analysis, based on the proposed cutoff wall profile, approximately 400 m (meters) in length indicated the seepage through the cutoff wall ranges from 123 to 4756 cubic meters per day (32,500 to 125,500 gpd) during the LOM. – Clarify whether this seepage is before or after construction of the cutoff wall. What is the total seepage into the pit before and after cutoff wall construction?

30. Explain the plan to monitor the effectiveness and integrity of the cutoff wall, including appropriate performance measures.

Hydrogeology

31. MPA, Vol 1, Section 5.7.6 and Figure 5-9: What is the containment plan for tailings pipeline and other process pipelines to capture leaks and keep from entering groundwater in areas where pipelines are outside of the lined tailings areas?

32. MPA, Vol 1, Table 5-8: This monitoring and inspection plan includes visual inspection of pipelines and repair of leaks. Provide procedures for cleanup of spills from leaks.

33. MPA, Vol ID, Appendix E, Section 2.1.2 and Figure 1-1: Non-contact storm water is sent to storage basins, which then discharges to topographically low zones in the project area. Do any of the conveyance pipelines exist in areas considered non-contact areas? If so, what is the plan to keep releases from spills and leaks from the non-contact storm water storage basins?

34. MPA, Vol IE, Appendix J, Section 2.2: It is common for a third-party vendor to arrange for an on-site or near-site storage magazine for explosives and an on-site location and/or mix plant for ANFO (Ammonium Nitrate/Fuel Oil) products. If this is the case, where will this be located, and how will groundwater be monitored for possible impacts from releases of nitrates?

35. MPA, Vol IE, Appendix J, Section 2.3 and Figure 2-3: Provide detail of fuel storage area and groundwater monitoring plans for review of adequacy of early warning for potential fuel releases.

36. MPA, Vol IE, Appendix J, Section 2.12.5: Since the applicant states there is a potential for chemical reagents to reach the environment, more detail of the off-loading zone, storage zone, and use areas is necessary to allow a review of the adequacy of planned secondary containment and early warning detection systems. How will potential groundwater impacts from this area be monitored?

37. EIA, Vol IIA, Appendix D, Table 5.1: A number of groundwater sample locations had Gross Alpha Activity analysis results well over 15 pCi/l, but the combined radium 226 and 228 results do not account for more than a fraction of the Gross Alpha activity. Why was Uranium not included in the baseline sampling?

38. EIA, Vol IIB, Appendix C: Explain why observation wells for aquifer tests were not constructed the optimal 1.5 to 5 times aquifer thickness distance away. Explain how the placement of observation wells at less than 1 times the aquifer thickness away provided good data for type curve matching and analysis, and that how that

data was not influenced by the steep slope of the drawdown cone near the pumping well.

39. Provide both overlay and cross section diagrams showing groundwater surface before pit dewatering and at point in time when maximum dewatering is occurring. Cross section should show river and slurry wall on one end, and the maximum extent of dewatering impact on the other end, and should cut through the natural groundwater divide going through the project area.

40. Explain why groundwater contours all converge to a single central point in the pit area in Figure 3-11 (Volume II).

41. Two different recharge values were used in the application. Most of the application refers to 7 inches per year, but the model input was 10 inches per year. What is the basis, and why is the change valid?

42. What will be the impact to river recharge since pit dewatering will intercept groundwater normally discharging to the river?

43. Explain the high value for nitrates in MW-20, and how this will be assessed moving forward.

44. The Mining Team recommends that additional monitoring wells will be needed to account for divergent groundwater flows across the project area due to groundwater divides. The following locations are advised:

    - Well located southwest of pit near river.
    - Well located south of pit and all storage locations.
    - Well located east of pit, north of pipeline and west of flotation tailings basin.
    - Well located north of flotation tailings basin and west of oxide tailings basin.
    - Two wells located south of entire processing facility bracketing the east and west edges.

    Provide an updated monitoring plan that addresses this comment.

45. The Mining Team recommends that additional monitoring wells will be needed to be added to the post closure monitoring plan to account for divergent groundwater flow across the area. The following locations are advised:

    - Well southwest of pit near river.
    - Two wells south of entire processing facility.
    - Well east of pit, west of flotation tailings basin, north of pipeline.
    - Well west of oxide tailings basin and north of flotation tailings basin.

Provide an updated post closure monitoring plan that addresses this comment.

Storm Water Management Plan, Volume ID, Appendix E

46. Non-Contact Water Basins (NCWBs) – At what point in the project timeline will the Northwest and South ponds be removed?

47. Section 2.3, Other Non-Contact Storm Water – "Storm water runoff from the topsoil stockpiles will be seeded, and the vegetation growth will minimize sediment yield, therefore negating the need for directing this runoff to storm water basins." Which topsoil stockpile(s) is this statement referring to on Figure 1-1? Since the need to direct runoff to storm water basins is negated because of seeding, does this imply that not all stockpiles will be seeded as proposed in the Soil Erosion and Sedimentation Control (SESC) Plan? (Figure 5-12 in the MPA, Soil Erosion Control Plans – Operations Phase, shows that all topsoil and overburden stockpiles are proposed to be seeded.)

48. Flow rate to liner system on TWRMF post closure – proposing to pump leachate (small quantities after year 6) into trucks and transporting to a local Wastewater Treatment Plant (WWTP) for disposal after on-site WWTP is reclaimed, or will be treated through an alternative on-site treatment process. Appendix I, Reclamation Plan – "At mine year 16, leachate generated by the TWRMF will be de minimis." However, there are plans in place to continue treatment offsite. How long will water have to be removed and treated off site after final reclamation?

49. How will the non-contact storm water basins be maintained after closure?

50. In Section 3.3, page 12 of the Storm Water Management Plan it states that the emergency overflow from the contact water basins will be an earthen weir with a ditch to the pit. Where will this be located considering that the storm water management plan shown in Figure 1-1 shows non-contact storm water conveyances and material processing/stockpiles between the contact water basins and the pit? In the Contingency Plan, if a runoff event exceeds the capacity of the CWBs, it is proposed to route excess water to the TWRMF for emergency temporary storage, and as an additional contingency, water can be pumped into the mine pit for additional temporary storage in the event adequate storage is not available at the TWRMF. Provide clarification as to the plan for emergency overflows in the CWBs.

Surface water

51. EIA, Volume II, Section 3.5.2, Table 3-10 and second bullet on page 25: Clarify whether the calculation for un-ionized ammonia or total ammonia was used. The water quality standard is an un-ionized ammonia number.

52. EIA, Volume II, 3.13.1 Aquatic Biota and Habitats Within Mining and Affected Areas, Page 39: Aquila states that a fish community consisting of 5 percent salmonid species is the criteria for a stream meeting Michigan's cold water standard. This is not correct; it is a 1percent salmonid population. Reanalyze the results based on this standard.

53. EIA, Volume II, Table 3-9 Surface Water Analytes for Environmental Baseline Studies: Explain why so many water quality constituents were dropped for the 2010 and 2011 sampling dates.

54. EIA, Volume II, Table 3-10 Summary of Surface Water Quality Baseline Sampling Exceedances: Provide a comparison of predicted effluent data from the Back Forty Mine WWTP with Wisconsin Water Quality Standards and provide a table showing the comparison.

55. EIA, Volume II, Figure 3-16 Surface Water Monitoring Locations: Provide location information for these stations, or refer to another table in the Environmental Impact Statement that includes the latitude and longitude coordinates.

56. EIA, Volume II, Appendix D-1, Section 5.2.2. Page 43: Why do the hardness values stated in this section not match those in table 5.2?

57. EIA, Volume II, Appendix D-1, Section 5.4, Table 2.1: Provide the location information for sampling locations in latitude and longitude decimal degrees.

58. EIA, Volume II, Appendix D-1, Section 5.4, Table 5.2: Why is there no data included for MSG2, MSG15, or MSG16?

59. EIA, Volume II, Appendix D-1, Section 5.4, Table 5.2: Is there an explanation for hardness data varying a great deal in the Menominee River when moving from upstream station (MSG-8) to downstream stations (MSG-13, 10, 14)? The hardness values ranged from 160-260 milligrams per liter (mg/L) at the upstream MSG-8 site to a range of 94-130 mg/L at the downstream stations.

60. MPA, Volume ID, Appendix G, Table 2-1: What is the plan for water quality monitoring during Phase 1 of post closure?

61. MPA, Volume ID, Appendix G, Table 5-1: Why are MSG-4, 5, 11, and 12 not included in the surface water monitoring plans?

62. MPA, Volume ID, Appendix G, Table 5-1: What water quality parameter testing will be included at these sites?

63. Provide a plan for additional surface water quality sampling and macroinvertebrate community surveys, prior to operations, to confirm seasonal baseline conditions, including, if possible, the following smaller streams, and as close as practicable to the following locations:

Spring Creek	-87.827660 45.438550
Boerner Upper	-87.811100 45.462200
Boerner Lower	-87.812240 45.464210
Unnamed Tributary Schonecks	-87.805010 45.472760
Unnamed WE Creek	-87.800910 45.480580

Biological Resources

64. EIA, Volume IIG, Appendix E, Section 2.3.2: Was there consideration of sampling for baseline levels of PAHs (polycyclic aromatic hydrocarbons) or PCBs (polychlorinated biphenyls)?

65. Explain why Hester-Dendy samplers were used for quantitative macroinvertebrate sampling versus other quantitative methods such as a stovepipe sampler or Surber sampler.

66. Provide an electronic copy of a table that combines the surface water quality data collected in the baseline studies and the macroinvertebrate data into one easy-to-read table. Include latitude and longitude decimal degree locations of sampling sites, and clearly indicate the dates and locations of data collected.

67. EIA, Volume IIG, Appendix E, Section 3.7.5, Appendix J, Phycotech Algae Analysis Report: Explain why quantitative periphyton and algae sampling was not conducted.

68. EIA, Volume IIG, Appendix E, Section 3.7.5, Appendix J, Phycotech Algae Analysis Report: How were the metrics noted in this section calculated?

69. EIA, Volume IIG, Appendix E, Section 3.7.5, Appendix J, Phycotech Algae Analysis Report Figures 18 and 20: When was the data collected at the stations

across the two years? At AQ20, what is the suspected cause of the reduction of richness and cell concentrations from one year to the other in Shakey River?

70. EIA, Volume IIG, Appendix E, Section 3.7.5, Appendix J, Phycotech Algae Analysis Report: If water chemistry data is available for the dates periphyton and diatom data was collected, provide an electronic spreadsheet that includes the periphyton data and diatom data and water chemistry data.

71. EIA, Volume IIG, Appendix E, Section 3.7.5, Appendix J, Phycotech Algae Analysis Report: What list of tolerant species did Phycotech use for the calculation of the sensitive algae, sensitive diatom, and saprobity metrics?

72. EIA, Volume IIG, Appendix E, Section 3.7.5, Appendix J, Phycotech Algae Analysis Report: Provide tables that include the actual numbers for the Shannon-Diversity, Alpha algal–cell concentration, Sensitive Diatoms, Sensitive Algae, Siltation Index, Salinity Index, Oxygen Index, Trophic Index, and Saprobity Index metrics to supplement the figures.

73. EIA, Volume IIG, Appendix E, Section 3.7.5, Appendix J, Phycotech Algae Analysis Report, Figure 16: What are the sampling dates for the two samples collected?

74. EIA, Volume IIG, Appendix E, Section 3.7.5, Appendix J, Phycotech Algae Analysis Report, Figure 28: What are potential reasons for the high salinity of Little Shakey Creek in 2009?

75. EIA, Volume IIG, Appendix E, Section 3.7.5, Appendix M, Pace Analytical Fish Contamination Report: Clarify what species were collected at each site, and the number and size of fish used in the composite samples.

76. MPA, Volume ID, Appendix G, Section 8.1.1: Clarify whether biological sampling, including macroinvertebrate and fish sampling, will be conducted as part of the Environmental Monitoring Plan during operations and post closure. If so, is this sampling included in the Financial Assurance estimates?

77. MPA, Volume ID, Appendix G, Section 8.1.1: The permit application states that a mussel relocation project may be needed. Explain and provide evidence for the conclusion that the WWTP Plant discharge is not anticipated to affect aquatic biota and habitats.

78. MPA, Volume ID, Appendix G, Section 8.1.1: Explain why mussels may need to be relocated, and how and where they may be relocated.

79. Clarify how many sites were surveyed for freshwater mussels.

80. EIA, Volume IIG, Appendix E-1, Section 2.2.1: Why does the dominant habitat description not match up with Tables 8 and 9? What is the explanation for the change in dominant substrates from years 2008 and 2009?

81. EIA, Volume IIG, Appendix E-1, Section 2.2.1, Table 18: Did ERM (Environmental Resources Management) visually verify these species as present, or does the list refer to species that should be found in that area? Clarify which aquatic macrophytes were present and their abundance.

82. EIA, Volume IIG, Appendix E-1, Section 2.2.1: Where is the data showing the channel characteristics results (glide, pool)?

83. EIA, Volume IIG, Appendix E-1, Section 2.2.3: Why was only 2008 sampled and not 2009 for the longitudinal profile and habitat scoring?

84. EIA, Volume IIG, Appendix E-1, Section 2.9.3: Why was only one fyke net deployed for each of the lakes (sampling stations)?

85. EIA, Volume IIG, Appendix E-1, Section 3.2, page 27: Why was the sampling conducted outside the recommended holding times? Explain how affected value was "appropriately qualified".

86. EIA, Volume IIG, Appendix E-1, Table 2-4: Why were water samples collected and analyzed for AQ3 and AQ6 for 2008, but not 2009?

87. EIA, Volume IIG, Appendix E-1, Section 3.3.1: Why were habitat and macroinvertebrate surveys not conducted in 2009 for AQ3?

88. EIA, Volume IIG, Appendix E-1, Section 3.7.1: Why was one year of data collected by electrofishing and seining by ERM? What was the electrofishing time for AQ1 and AQ3? Why was one seine performed in AQ1 and two in AQ2 and AQ3, and what is the justification for the comparison between these sites?

89. EIA, Volume IIG, Appendix E-1, Section 3.7.1, Table 29: On page 42, it is written as data collected by Wisconsin Department of Natural Resources (WDNR) in 2003, 2005, and 2006, but the actual table is titled "2003, 2005, and 2009." Clarify the years that data was collected by WDNR.

90. Provide raw data for all fish community data collected, including lake sturgeon.

91. EIA, Volume IIG, Appendix E-1, Section 3.7.3: How many net nights for the fyke nets?

92. EIA, Volume IIG, Appendix E-1, Native mussel surveys at selected sites: Was water quality or flow data recorded during the surveys? If so, please provide.

93. EIA, Volume IIG, Appendix E-1, Lake Sturgeon Early Life Stage Investigation: Dr. Auer considers spawning size of lake sturgeon to be 114 cm while Sloss and Kittel consider a lake sturgeon over 100 cm to be spawning size. Explain the difference in length of maturity and if this impacts the analysis of the adult population in this reach.

94. EIA, Volume IIG, Appendix E-1, Lake Sturgeon Early Life Stage Investigation: Figure 2 is described showing flow and temperature data but only flow is shown. What was the temperature at this location during deployment for 2008?

95. EIA, Volume IIG, Appendix E-1, Lake Sturgeon Early Life Stage Investigation: Explain why nets were set on May 11th, as opposed to when larval drift was predicted to start.

96. EIA, Volume IIG, Appendix E-1, Lake Sturgeon Early Life Stage Investigation: Explain why the site was chosen for setting the drift nets, and why no additional collection sites were chosen between the 5.5 miles and the spawning site.

97. EIA, Volume IIG, Appendix E-1, Lake Sturgeon Early Life Stage Investigation: At what depth were the drift nets set? Did they encompass the entire water column?

98. EIA, Volume IIG, Appendix E-1, Lake Sturgeon Early Life Stage Investigation: Why was a visual survey method chosen for juvenile lake sturgeon versus other methods that have been used for juvenile surveys?

99. EIA, Volume IIG, Appendix E-1, Lake Sturgeon Early Life Stage Investigation: Figure 2: How do these years compare to the long term averages for discharge of the White Rapids dam?

100. EIA, Volume IIG, Appendix E-1, Lake Sturgeon Early Life Stage Investigation: Has there been any more recent data collected on the early life stages of lake sturgeon in this stretch of river?

101. EIA, Volume IIG, Appendix E-1, Appendix D: Is there updated information on the adult population of lake sturgeon for this stretch of river, in particular population estimates, tagging/tracking surveys, evidence of natural reproduction, from 2010 to present? If so, please provide or reference.

102. EIA, Volume IIG, Appendix E, Phase I Environmental Baseline Studies-Aquatic Biota, 3.1: ERM referenced procedures established in Qualitative Biological and Habitat Survey Protocols for Michigan's Non-Wadeable Rivers and Michigan DNR Fisheries Division: Manual of Fisheries Survey Methods II with Periodic Updates. What specific methods were used on the July and August 2007 reconnaissance surveys? In the discussion it reads "wildlife observed by sight or by other evidence." What is other evidence? During the second reconnaissance assessment, depth was recorded to be from "several feet to eighteen feet." What specifically is "several"?

103. EIA, Volume IIG, Appendix E, Phase I Environmental Baseline Studies-Aquatic Biota, 3.3: Is wild rice being considered in the aquatic habitat monitoring plan?

104. EIA, Volume IIG, Table 2: Update the observations of lake sturgeon under "Potential Occurrence."

105. EIA, Volume IIG, Table 4: Under "Potential Occurrence" why are Elktoe, Slippershell, and Round Pigtoe not noted as being observed, and why is the Black Sandshell not listed? Occurrences need to be updated.

106. What measures are proposed to keep wildlife out of the CWBs?

107. Provide a plan to evaluate potential hibernacula and habitat for the northern long-eared bat in the affected area, including potential impacts from mining activities and mitigation of any impacts.

Soil Erosion and Sedimentation Control Plan, Volume ID, Appendix E

108. Figure 2-7, Erosion Control Plan Operations Phase, shows a symbol in the legend for contact water drainage ditches. Since this symbol does not appear on the map, clarification is needed as to whether drainage ditches in the contact area are proposed, and if so, Figure 2-7 needs correction with the location(s) included, preferably at an easier to read scale.

109. Table 2-1 in the SESC plan shows plans to inspect soil erosion structures weekly, including basins. Table 5-8 (Monthly Schedule for Inspection and Monitoring of Mine-Related Facilities) in the MPA shows the Inspection Frequency for Storm Water and Erosion Controls to be monthly and does not include NCWBs. Provide a table that shows the proposed monitoring schedule for all mine-related facilities for both during operations and post closure that is consistent with all plans proposed in the application.

Treatment and Containment Plan, Volume IE, Appendix H

110. Following the waste rock placement, leachate drainage material (liner) from the base of the Flotation TWRMF will be relocated to the mine pit and backfilled over the waste rock. Provide alternatives for disposal of liner material.

111. Figure 4-16 – placement of contact water sump: How was placement of contact water sumps within the TWRMFs determined in the design?

112. Provide a plan to cover the TWRMFs if operations are temporarily idled for an extended period of time prior to final closure.

113. All collected drainage water will be pumped to the WWTP for treatment until the drainage flow rate decreases to the point at which alternative methods to remove and dispose of drainage water can be implemented. One such alternative method might include periodic pumping of the sumps to a tanker truck with disposal at a local WWTP. Infiltration modeling of the capped Closure TWRMF during post closure has been conducted… "Because all water draining through the Closure TWRMF during post closure will be collected and treated prior to discharge, the quality of the drainage water within the Closure TWRMF has not been modeled during post closure." Volume IIE, Appendix D-5, p. 18-19: What is the rationale for choosing not to model the quality of drainage water within the Closure TWRMF? Provide a time line for when water treatment of leachate is no longer necessary.

114. Page 28, "The reconfigured Oxide TWRMF will be capped with a composite cover, reclaimed, monitored, and maintained for a period of 20 years." What is the rationalization for the proposed time line of 20 years to monitor and maintain the closure TWRMF?

115. Table 5-1, Contact Water Basin Design Criteria: Mine groundwater inflow pump rate is not included as an item on this table, yet it is listed in the summary in Section 5.2. For consistency, clarification is needed as to whether groundwater inflow was taken into account in the CWB design.

116. Table 7-1: What is the total capacity of the pit based on the design criteria? Was the addition of buffering material taken into account in the mine pit backfill and closure TWRMF design criteria? If so, how?

117. Water Management Plan: Miscellaneous flows were not taken into account for the CWB design, including truck wash and ore stockpile return, as these flows balanced to produce a net flow rate that was negligible compared with the main flow components. What is the total projected miscellaneous flow?

118. Water Management Plan: The pump rate (195 gpm) from the pit was determined for the model based on an iterative process, with consideration given to minimizing both CWB size and ponding duration in the mine. A maximum allowable ponding duration in the pit will be established in the future based on the current pit development conditions (during operations). Is this flow rate projected to be the maximum flow rate from the pit during operations? How was this flow rate determined?

119. Water Management Plan: Groundwater inflow into pit from the groundwater model was determined to be an average annual rate of 242 gpm. Does this take into account the construction of a cutoff wall?

120. Water Management Plan: The CWB max storage (ponding value) designed to be 125.4 M gal; Section 3.9, p. 17, maximum and average model output daily flow rates from the combined TWRMFs to the CWB were 9310 gpm and 402 gpm, respectively. These flow rates are not listed in the CWB design summary. Were they taken into consideration when sizing the CWBs?

121. Water Management Plan: HYDRUS model: Precipitation and evaporation were set to zero to simulate the impermeable cap on the facilities during closure, and the model run set to 20 years. Why was this duration chosen?

122. Section 5.4, p. 23: During the reclamation phase, flow rate to the TWRMF sumps will be monitored to determine when it would be more efficient to remove the CWBs and WWTP, and implement an alternate method to remove and dispose of water reporting to the sumps. For the purposes of the WWTP closure, leachate collection becomes de minimus in post closure Year 6 (Mine Year 17). At this time, the WWTP will be removed from service. Leachate generation during the remaining period of post closure will range from 4.0-0.76 m3/hr (17.5-3.4 gpm). This quantity of leachate will be managed via pumping into tanker trucks and transporting to a local WWTP for disposal or will be treated through an alternative on-site treatment process. How long is water treatment of leachate predicted to be necessary beyond the proposed 20 year post closure period?

123. Table 4-3: Explain how the disposal quantity volumes were calculated, including any swell factors that were applied.

124. Explain how the proposed design of the TWRMFs meets the requirement of having a leak detection system. How will leaks be mitigated if detected? Drainage gravel and pea stone are to be used in the leachate collection system and as a protective layer over the HDPE liner system. Explain how the granular materials

to be used will be demonstrated to be non-reactive with the leachate generated from the tailings and waste rock.

125. Appendix B GCL/Clay Equivalency Analysis: The equivalency analysis using Darcy's Law determined that in order for a geocomposite clay liner (GCL) to attain required hydraulic conductivity of three feet of 1 x 10(-7) cm/sec clay specified in Rule 409(a)(i)(A), the GCL must have a hydraulic conductivity of 3.0 x 10(-9) cm/sec. However, manufacture specifications for this material is states the hydraulic conductivity of GCL is 5 X 10(-9) cm/sec. The report states that the lower conductivity is "achievable with a GCL based on manufacturer's data and independent testing." Please explain how you will demonstrate that the necessary hydraulic conductivity will be attained. The calculations in the help model also rely on achieving the 3.0 x 10(-9) cm/sec standard.

126. Appendix G: Construction Quality Assurance Plan: The DEQ recommends the following additions to the CQA Plan:

- A notation that proposed deviations from the approved construction plans and specification should be approved by the DEQ prior to implementing the changes.
- Section 3. 2- Establish an acceptable standard for foundation grading to ensure that the foundation is prepared in accordance with design grades.
- Restrict use of vehicles on geomembrane materials.
- The CQA plan states that it will be consistent with the requirements of Rule 921 of the Part 115 administrative rules, the final version of the CQA plan should spell out all the appropriate requirements in detail.

Reclamation Plan, Volume IE, Appendix J

127. After the pit is backfilled it is estimated to take 22 years to naturally flood the pit. Twenty years of post closure monitoring after completion of backfill is currently proposed in the Environmental Monitoring Plan. Part 632, Rule 407 states "The post closure monitoring period shall be 20 years following completion and approval of reclamation…" Section 4 of the Reclamation Plan states "Monitoring for approximately 20 years following completion and approval of reclamation." How does the proposed schedule meet the requirements of Part 632 for post closure monitoring?

128. Phase 4 is designated "final reclamation" in Table 2-1 and "post closure reclamation" in Table 2.2 (Mine Year 16-17). What is the difference between "final reclamation" and "post closure" reclamation?

129. What measures will be in place to ensure that the liner of the flotation TWRMF will not be compromised, or leachate will not be released to the environment, during backfill of the pit and the transfer of remaining waste material to the oxide TWRMF for final closure?

130. Section 3.5.4, page 7 - "Limestone or other acid buffering material will be added to the backfill plan based upon subsequent geochemical test work planned by Aquila." – How will this affect volumes of material going into the pit?

131. Section 3.5.6 – Will the River Road be rerouted for through traffic during operations? Will the River Road be routed through the site after closure for public use? If so, include plans for reclamation of the River Road.

132. Explain the reasoning for backfilling the pit with waste rock to 1 meter below the low groundwater elevation, including justification as to how this will control potential acid generation.

133. Was placement of a mixture of tailings and waste rock placed into the pit considered for final tailings disposal? If so, explain why this approach was not proposed. If not, provide an analysis for this alternative.

Environmental Monitoring Plan, Volume ID, Appendix G

134. Provide a plan for monitoring impervious surfaces in the contact area as part of the monitoring/maintenance schedule.

135. Section 2.1.1: "...a Sampling and Analysis Plan (SAP) to be prepared as a condition of the mine permit."; "The SAP will include a Quality Assurance Plan (QAP)." – Rule 203 (g)(iii)(B)(ff) Quality Assurance/Quality Control (QA/QC) as approved by the MDEQ – shall be included as part of the mine, reclamation, and environmental protection plan. Also 203 (g)(iii)(D); Part 632 rules require the applicant to provide a QA/QC plan as part of the mine, reclamation, and environmental protection plan.

136. Provide a plan for monitoring the effectiveness and integrity of the cutoff wall.

137. Provide an explanation as to how the proposed list of monitoring parameters, and the proposed target detection limits in Table 2-1 was determined. Specifically, why was cobalt, uranium, vanadium, hardness, radium, volatile organic chemicals, acrylamide, and any other organic chemical used in the mineral processing area, excluded from the list? Also, please explain why method detection limits for some analytes are greater than ½, or in two cases at the Michigan Part 201 Residential

Cleanup Criteria value, instead of at a lower value that allows for assessment of potential impact prior to the criteria being reached or exceeded.

138. Will the annual assessments of flora, fauna, fish, and wildlife habitats and biodiversity follow the same protocol as the baseline studies?

139. Section 9.2, Post Closure Groundwater Monitoring Plan: "...leachate wells LW-12S and LW-12D will be installed in the closed pit area..."; Figure 9-1 shows wells labeled CW-12S and CW-12D located in the backfilled pit area. Clarification is needed as to whether the wells in the figure are the wells referenced in the text in Section 9.2. What is the difference between 12S and 12D in terms of the hydrostratigraphic zones proposed to be monitored?

140. Section 9.4: What environmental monitoring is planned during mine years 8-10 (reclamation activities)?

141. Table 6-1: What is the definition of a major storm event?

Contingency Plan, Volume IE, Appendix J

142. It is mentioned that high-cal limestone could be added as an additional measure to offset the formation of acid leachate. In other parts of the application, it is proposed that some type of buffering material will be added to the pit backfill and/or TWRMF(s), with limestone as a possibility. Water quality was modeled to take into account a buffering amendment. Why is the addition of limestone amendment included as a contingency if it has been determined that acid leachate from waste will most likely form?

143. Provide a risk analysis for a flood that inundates the mine area. Explain what contingencies will be in place if the mine area is flooded.

144. How will groundwater impacts from potential leakage from the CWBs be evaluated?

145. Stockpile liner failure: How will the stockpiles be lined? Is this referring to the OBA (Ore Blending Area)?

146. Where will monitoring devices be installed to notify staff of abnormal water levels at the OBA?

147. Section 2.1.4, covered oxide and flotation ore stockpiles: Is the concrete pad sloped to a sump described under the mitigation of risks the same sump described for the OBA?

148. How will monitoring of the integrity of the cutoff wall before and after blasting events be accomplished?

149. What contingencies will be in place if the cutoff wall is determined through performance monitoring to be ineffective for its intended purpose?

150. Will the fuel storage area be monitored for groundwater impacts?

151. What are the potential impacts to facilities of ground seismic vibrations from blasting, including the cutoff wall, if any?

152. What is the potential risk to the environment or public health from damage to facilities from severe thunderstorms or tornadoes, and what are the proposed response measures?

153. Section 3.3: The River Road, which is located along the west side of the pit, will be temporarily closed during scheduled blasting within the pit in the vicinity of the road. Other parts of the application imply that the road will be closed to the public through the mine area during operations. No plans were offered to divert the road around the pit or the mine area, and all figures in the application depicting the development plan show the River Road as "ending" at the pit. The contingency plan implies this road will be open. Clarify what is to become of the River Road during operations and post closure.

Financial Assurance, Volume IE, Appendix K

154. Table 2-1, post closure monitoring activities: Requests to reduce environmental monitoring during the post closure period cannot be approved prior to completion of reclamation. Provide a cost estimate for quarterly groundwater and surface water monitoring at all proposed monitoring locations for the complete list of analytes, and flora and fauna monitoring throughout post closure monitoring for end of LOM operating period.

155. What is the estimated length of time it will take to complete reclamation at end of construction? (3 years for end of LOM)

156. Since River Road Reconstruction is a line item in the Reclamation and Cost estimate, provide the plans for this reconstruction as part of the reclamation plan.

157. Explain the reason for the difference between the end of construction and end of LOM quantities (and therefore cost estimates) for the onsite facility access roads and the onsite maintenance roads.

158. Explain how the cost estimate for removal of impacted soils was determined for end of LOM.

159. Explain how the Wastewater Treatment costs for post closure for the end of LOM estimates were determined. Was the cost of filtering wastewater and disposal of waste solids included in the estimates?

160. Explain how and why a discount rate of 2 percent was applied to post closure monitoring and maintenance for end of construction and end of life of mine estimates.

161. Do the financial assurance estimates take into account proper abandonment of monitoring wells? If so, specify the line item.

162. What sources were used for cost estimates?

163. Recalculate Financial Assurance estimates as necessary to reflect any modifications or adjustments in the Mining, Reclamation, or Contingency Plans based on the response to MDEQ requests for additional information or clarification.

EIA, Volume II

164. Is the mining area, as defined in Part 632, proposed to be the entire area within the project boundary on the figures provided in the EIA? If not, provide a figure defining the mining area for the project.

165. Provide a figure (or figures) showing the affected area where the land surface, surface water, groundwater, or air resources are determined through the EIA to be potentially affected by operations within the proposed mining area.

166. Volume II, Figure 3-20: Reference where information regarding the average annual flux values is located in the MPA.

167. How were samples chosen for ABA (acid base accounting) for soils?

168. How were constituents chosen for analysis for soils?

169. Paste pH data for 5 sites was analyzed for ABA – provide the rationale for choosing these 5 sites for this analysis.

170. Infrastructure – shows using River Road for transport, but no mention of fate of River Road passing through project; road fenced off south and north of project area. What are the impacts to the River Road?

171. Aesthetic resources Section 3.19 – During operations the River Road will be detoured to accommodate the open pit excavation. - Will a replacement road be constructed through the backfilled pit post closure or permanently rerouted/detoured?

172. Noise Mitigation – What time of day will blasting occur? (approximately twice per week; every 2-3 days in contingency plan)

173. How were the boundaries of the "affected areas" shown in Figure 1 determined?

174. Memorandum on site-wide water balance, Vol IIE, Appendix D-6: How does the average annual precipitation from NOAA (National Oceanic and Atmospheric Administration), 2000 compare with onsite precipitation data? Is there more recent data available?

175. Cumulative Impacts – The deposition of particulate matter was evaluated as a possible additive effect - What are the possible the additive effects of surface water discharge?

Feasible and Prudent Alternatives

176. Mining method – preliminary assessment of underground mining showed that it is not a prudent alternative for this ore body – What is the reference for this assessment?

177. Ore Processing location – same location as mining, advantage of reduced transportation costs – What other ore processing sites were considered?

178. Tailings management/storage/disposal – The preferred method (co-disposal of waste rock and thickened tailings) was selected because it provided best project value with reduced storage footprint. Was the possibility of increased potential for oxidation for thickening or dry stack possibilities considered in the alternatives analysis, as opposed to conventional slurry with high water content? Was the backfilling of the tailings into the pit considered for closure, either mixed with the waste rock as much as possible, or all tailings in the pit with waste rock left on the surface? Was the possibility of offsite tailings and/or waste rock disposal considered?

179. What other locations were considered for the TWRMFs?

180. Tailings management – de-watered tailings to 81 percent solids, around 78 percent stated in Section 5.6.4. Clarify the expected percent of solids for the de-watered tailings.

181. Provide an alternatives analysis comparing a dry stack (86 percent solids) to the proposed dewatering.

182. Were alternatives considered for the use chemicals other than cyanide for ore processing?

Water Quality Models for Open Pit and Tailings and Waste Rock Management Facilities

183. Section 4.2.1 - The backfill will be amended with additional alkalinity to ensure pore water is buffered at a circumneutral pH. - How will this be determined?

184. Water quality models were also constructed to estimate water quality in the TWRMFs when amended with limestone, and backfilled pit pore water quality post closure. Explain how the limestone amendment was applied in the models, including volume ratio and surface area.

185. Backfilled pit: Water quality is predicted to be neutral buffered by alkalinity from groundwater and calcite amendment to the backfill material. Explain how the calcite amendment was applied in the model, including volume ratio and surface area.

186. TWRMFs: Concentration of modeled constituents increased over time; flotation tailings acidic, oxide tailings neutral to increasingly acidic. Modeling predicted that concentrations of metals will decrease significantly and pH will increase to circumneutral when they are amended with limestone, or when water quality is buffered with additional alkalinity. Explain how the limestone amendment was applied in the model, including volume ratio and surface area.

187. Section 3.2: During backfilling, the waste rock will be amended with limestone or other suitable buffer material… What types of buffering material are being considered?

188. Section 4.2.2: The liner system that will have been installed during construction of the TWRMFs during operations will remain in place. Will the entire liner system from the flotation TWRMF remain in place? This would not be consistent with the Treatment and Containment Plan Section 4.2.2

189. "Because all water draining through the closure TWRMF during post closure will be collected and treated prior to discharge, the quality of the drainage water within the closure TWRMF had not been modeled during post closure." What about after post closure? Will this water have to be treated in perpetuity?

190. Section 5.2.1 – Because it is anticipated that the pit backfill will be amended with limestone in order to ensure that pH is adequately buffered, calcite was added to the equilibrium geochemical model in order to bring the system to saturation with respect to calcite. Explain how calcite was added to the equilibrium geochemical model. How much limestone is predicted to be required to ensure that pH is adequately buffered in the pore water?

191. Table 5-2, Backfilled Pit Pore Water Quality Summary – It is mentioned in the backfilled pit conceptual model that the backfill will be amended with additional alkalinity to ensure the pore water is buffered at a circumneutral pH. Clarify whether an alkalinity amendment was taken into account in the model to produce the predicted water quality results presented in Table 5-2.

192. Section 5.2.3 - "Aquila will generate a plan to improve water quality within both the flotation and oxide TWRMFs so that the leachate that reports to the sumps is approximately circumneutral pH. This plan will be developed during the final engineering state of the Project, and submitted to the MDEQ for review and approval as part of a permit condition." Because of the implications to the design of the facilities proposed, provide a plan to improve water quality within both the flotation and oxide TWRMFs as part of the Mine Permit Application, along with an alternatives analysis for possible options, also to include water quality predictions for the Closure TWRMF at the end of the proposed post closure monitoring period.

Cultural Resources

193. Provide a mitigation plan for discovered archeological sites.

Potable Water Supply

194. MPA, Vol 1, Section 2.2: Plan for potable and non-potable well installation in future. An additional water withdrawal assessment for additional water wells will have to be done, and a Michigan Safe Drinking Water Act construction permit, through the local health department, will be necessary for all components of the potable water supply source and treatment system.

195. MPA, Vol 1, Section 5.7.9.4: Provide an alternative plan for treatment of potable water. Ultraviolet disinfection is not an approved process in Michigan.

196. MPA, Vol 1, Section 5.7.9.6: There is no mention or acknowledgement that a construction permit will be required for the on-site sanitary wastewater system. The local sanitary code of Public Health Delta and Menominee Counties requires one.

Air Deposition

197. Provide a soil deposition impact analysis.

Thank you for your cooperation and attention in this regard. Please contact either me at the number below, or Melanie Humphrey at 906-250-7564, to discuss the timing for responding to this request, and with any questions you may have.

Sincerely,

Joe Maki
Office of Oil, Gas, and Minerals
Upper Peninsula District Office
906-250-4051

JM:TC
cc: Mr. Hal Fitch, MDEQ
Mr. Rick Henderson, MDEQ