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Crandon Mining Company responses to selected Wisconsin Department of Natural Resources July 31, 1995 comments on the Crandon Mining Company Environmental Impact Report. 1995

Rhineland, Wisconsin: Crandon Mining Company, 1995

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Crandon Mining Company

7 N. BROWN ST., 3RD FLOOR
RHINELANDER, WI 54501-3161

November 16, 1995

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Mr. Bill Tans
Wisconsin Department of Natural Resources
Bureau of Environmental Analysis and Review Management
101 South Webster Street
P.O. Box 7921
Madison, WI 53707-7921

Dear Mr. Tans:

Re: Crandon Project - CMC Response to WDNR's July 31, 1995 EIR Review Letter

Crandon Mining Company (CMC) is in the process of developing responses to the *Environmental Impact Report* (EIR) comments contained in the Wisconsin Department of Natural Resource's (WDNR) July 31, 1995 letter. The responses fall into four categories as outlined below:

- Those that involve the identification of the location in various project submittals where the comment has, in CMC's opinion, already been addressed;
- Those that involve clarification which does not require a revision to existing documents;
- Those that CMC would like to discuss with WDNR before finalizing the response; and,
- Those that involve additions or modifications to the EIR.

Enclosed with this letter are responses relating to the first two categories. The format used in the enclosure is to first list WDNR's comment and immediately follow it with CMC's response. For clarity, both the comment and response numbers are listed for each item.

Responses to items that are in the third category will be prepared once the items have been discussed with the WDNR. These items are numbers 26, 31 through 45, 56, 57, 58, 75, 76, 79, 128, 129, 130, and 135.

Items requiring EIR additions or modifications will be addressed in updates prepared for individual EIR subsections. For instance, surface water related responses requiring EIR additions or modifications will be incorporated into an update to Section 3.7, Surface

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Mr. Bill Tans
Wisconsin Department of Natural Resources
November 16, 1995
Page 2

Water and Bottom Sediments, that will be forwarded under separate cover at a later date. Responses will be incorporated into the update using the following format:

- Additions or modifications to the EIR will be made on pages that will replace those in the original 3-ring binders, so that each set of EIR binders can be completely updated. Additions to the original text will be clearly identified with the use of shading.
- A compilation will be included with each update in a separate Comments/Response section to be added to the EIR indicating the substance and disposition of CMC's responses to each WDNR EIR letter. If the WDNR requested information is provided outside of the EIR (e.g., in a permit application), the compilation will indicate where the information was provided.
- All updates will be distributed to those individuals who are currently listed on the EIR's distribution list which was revised on October 4, 1995.

Should you or your staff have any questions, please call me at (715) 365-1450.

Sincerely,



Don E. Moe
Technical/Permitting Manager
Crandon Mining Company

DEM:mld2

Enclosure

cc: All individuals currently on the EIR distribution list.

Crandon Mining Company Responses to Selected Wisconsin Department of Natural Resources July 31, 1995, Comments on the Crandon Mining Company Environmental Impact Report

General Comment: In the glossary of terms, CMC should consider adding definitions that are provided in various documents, e.g., "project area, mine site, plant site, and tailings management area." In addition, definitions of drainage lakes, seepage lakes and spring lakes could be added (discharge water body and recharge water bodies are presently included).

General Response: *CMC will consider incorporating these suggestions into one of its pending EIR updates.*

Section 2 General Project Description

Comment 1: Terry McKnight's letter to Mr. Ron Steg of Foth and Van Dyke, dated June 13, 1995, contains our detailed comments and concerns on the proposed wastewater pipeline corridor to the Wisconsin River. These concerns should be incorporated into the revisions to the EIR relating to the waste water discharge pipeline route.

Response 1: *The comments and concerns expressed in Terry McKnight's letter of June 13, 1995 have been addressed in Volume IIIa, Appendix 3-2 of CMC's EIR, titled "EIR Supplement: Wisconsin River Wastewater Discharge Pipeline for the Crandon Project". This document was issued in September of 1995.*

Comment 2: p. 11 Utilities - More detailed route locations should be developed for the proposed gas pipeline route as soon as practicable. Also, would a full six-inch gas pipeline be needed if gas volume is reduced at the connection with the existing six-inch ANR gas pipeline?

Response 2: *Attached to this enclosure is a figure which shows the location of the proposed gas pipeline route. The pipeline would be installed, maintained, and operated by Wisconsin Public Service Corporation (WPSC). The line will consist of a 6-inch diameter steel pipe that would be reduced to a 4-inch diameter steel pipe as it approaches the CMC plant site. The operating pressure of the line would be 150 psi.*

WPSC plans to service other potential customers from the line along its route. Currently WPSC does not have an estimate of the number of additional customers it will service from the line. If a gas pipeline were to be installed strictly for the Crandon Project, its diameter would be four inches, with an operating pressure of 150 psi.

Comment 3: p. 12 Mine Reclamation - The last sentence states "The water treatment plant area and pipeline routes will be graded and revegetated." The meaning of "pipeline routes" should be clarified, since most of the wastewater discharge line to the Wisconsin River will reportedly be left in place. This statement also appears in Section 2.4.11, page 20, paragraph 3, last sentence of "Tailings Management Area Feasibility Report/Plan of Operations".

Response 3: *Pipeline routes used in the referenced sentence refer to above ground pipelines, such as those proposed for tailings delivery from the plant site to the tailings management area (TMA) and from*

the reclaim pond to the plant site. As such, during reclamation the pipelines will be removed from these areas and then the pipeline routes will be graded and revegetated.

Comment 4: In paragraph 4, sentence 3, the meaning of "construction materials" should be clarified (bridges, culverts, pavement, ballast, road subgrade soils, etc.).

Response 4: *In the context of reclamation, "construction materials" includes the above grade portion of concrete foundations and slabs, crushed stone base, road and railroad ballast, bituminous concrete, bridges and/or culverts as detailed in Table 5-12 of the Mine Permit Application.*

Comment 5: Page 2-12, Part 2.4.11, Paragraph 2 - Monitor wells and drill holes in the construction area which are not designated for future use should be abandoned prior to construction and not at reclamation.

Response 5: *CMC agrees with the desirability of abandoning existing monitoring wells and drill holes in the construction area not designated for future use prior to construction, and plans to do so as outlined in Section 7.1.3 of the Mine Permit Application (MPA). The reference to open boreholes relates to boreholes installed from the surface into the mine during the construction process for the delivery of tailings to be used for backfill purposes or the delivery of diesel fuel for the operation of underground equipment.*

Comment 6: Within reason, all underground equipment should be removed. If not, the company needs to indicate in advance what they propose to leave underground.

Response 6: *At the present time, CMC expects that some mobile equipment, electrical cabling, air and water piping, steel chute assemblies, conveyor galleries and belting, shaft guides, miscellaneous steel, timber bulkheads, auxiliary fans, electrical switch gear, etc., may be left underground.*

Section 3 Description of the Environmental Setting

3.2 Cultural Resources

General Comment: The State Historical Society has already commented on this section[.] Please make the appropriate changes to the EIR based on those comments.

General Response: *CMC is working with the Wisconsin State Historical Preservation Office and the U.S. Army Corps of Engineers (USCOE) regarding the review of this section of the EIR. CMC will update Section 3.2 of the EIR, as needed, to respond to the review comments of these two agencies.*

3.3 Transportation and Utilities

Comment 7: Railroad Spur and Access Road - During public meetings, a number of people living near Ground Hemlock Lake and along East and West Shore Lanes were concerned about noise from mine-related trains and also possible blocking of emergency vehicles such as ambulances and fire trucks at the town road (Hemlock Lake Road). Also, some citizens living in other communities along existing rail lines expressed concerns on possible increased train noise (including whistle blowing at road crossings) at various times of day or night in their areas. Please provide information on these aspects in the noise section.

Response 7: *Noise impacts related to the railroad spur and access road are addressed in Section 4.2.10.1.2 of the project's EIR.*

Currently the Wisconsin Central Limited Railroad is moving two trains per day on their existing rail line; one southbound and one northbound. With the present load on this line, Wisconsin Central is proposing to upgrade the service to four trains per day within the next two years. This action is independent of the permitting of the Crandon Project. Mine site railcar movement will consist of coupling, transporting, and decoupling approximately 10 to 15 railcars per day to the Keith Siding spur. Wisconsin Central will be responsible to decouple empty railcars and to couple full railcars from the Keith Siding site. This activity will occur more than 1.75 miles from the intersection of Hemlock Lake Road and the railroad line and, therefore, should not interfere with emergency vehicles.

Comment 8: In our earlier communications with Exxon, the company provided the following information: Exxon's locomotive would be expected to deliver approximately 18-20 rail cars of ore concentrate daily to the sidings. This would be limited to daylight hours. (Lewis H.S., per. comm., 7/30/84). The Soo Line would pick up about 50-60 cars of concentrate at a time, approximately once every three days. At those times, the Soo Line would also return about 50-60 empty concentrate cars. Supplies to the mine/mill are estimated to require about 10 rail cars per week (Schroeder, C., pers. comm., 7/24/84). Please provide comparable information for this proposal.

Response 8: *Wisconsin Central Limited Railroad will transport approximately 10 to 15 railcars per day of concentrate and mine site consumables and drop these cars at the Keith Siding railroad spur. A CMC site locomotive will move and switch these 10 to 15 cars per day from the Keith Siding spur to the plant site. These activities will potentially occur at any time during the day.*

Comment 9: How will the wetland areas filled for the access road and the railroad be reclaimed? If these corridors are abandoned after mining, we would like to see at least partial fill removal. Previously we have indicated that we should consider requiring removal of culverts along the streams and drainages on abandoned portions of the rail spur and access road. In the long term, they might deteriorate, collapse and impede stream and/or wetland drainages. Obstruction could be greater where considerable fill was left in place over collapsed culverts. Resultant flooding may kill trees and/or change other vegetation. According to the former plans, only the ballast will be removed if the railroad corridor is abandoned. We agree that CMC would not have to remove all the rail spur's wetland fills, except where associated with culverts, so drainage patterns would be maintained. Creation of warm water impoundments draining to nearby trout waters should be discouraged. Culverts in abandoned access road and rail spurs fills should be removed to prevent obstruction to drainages and streams.

Response 9: *Generally, earth fill material used for construction of the access road, railroad spur, and above ground pipelines will not be removed during reclamation. These areas will be revegetated as outlined in Section 5 of the MPA. CMC intends to remove culverts and bridges installed in wetland areas as part of the reclamation process and to remove sufficient earth fill to allow drainage patterns to be self-sustaining.*

Comment 10: Crandon Mining Company (CMC) should provide a map portraying the currently proposed location of the railroad siding areas.

Response 10: *Figure 2-2 of the EIR and Figure 4-2 of the MPA show the currently proposed location of the railroad spur line. The east-west segment of the spur line adjacent to the Wisconsin Central*

Limited main line track will contain at least one siding. A figure will be included in an update to the project's MPA illustrating the location of the siding(s).

Comment 11: CMC should provide information that portrays and quantifies the wetland areas that would be filled or otherwise disturbed by the access road and railroad spur.

Response 11: *Section 2.8 of the MPA and Section 4.2.7 of the EIR provide detailed information portraying and quantifying the wetland areas that would be filled or otherwise disturbed by the access road and railroad spur.*

Also, the July 20, 1995, document entitled "Section 404 Permit Application - Addendum 1" provides information on wetlands that will be disturbed during the construction of the railroad spur and the access road. Table 7-1 of that report quantifies, by type, the wetlands to be disturbed during construction. Figures 6-5 and 6-7 depict the routing of these corridors and the associated wetlands.

Comment 12: If Sand Lake Road would need to be improved as mentioned, widening would likely result in some wetland filling. This should be estimated and included as part of the EIR, with proposed mitigation and Corps permit requirements for the Town(s) described.

Response 12: *CMC does not intend to widen Sand Lake Road which would be used during the early construction period. This road may require re-surfacing after the project's construction period.*

Comment 13: Utilities, paragraph 2 - The Mole Lake Village water supply should also be mentioned. Although this is regulated by the Federal rather than State government, the Mole Lake has a "community water system" with a water tower, and at least one well located in the Ackley Subdivision. Buildings are served by septic systems at this time. We are not aware of any plans to install a sewer system and/or water treatment facility.

Response 13: *Comment noted. An addition to this section of the EIR will be included in an update.*

3.4 Climatology, Meteorology and Air Quality - Further comments may be provided following Department receipt and review of the air quality permit application.

Comment 14: p. 3.4-6, 4th paragraph, "Once a PSD source is permitted in a given county, the PSD baseline...." This sentence misstates when the baseline data is set. The PSD baseline date is established on the date the source subject to PSD submits a complete application, not when the source is permitted.

Response 14: *Comment noted. A clarification of this section of the EIR will be addressed in an update.*

3.5 Geology and Soils

Table 3.5-1 - Parts of this table are not consistent with our understanding of the drill holes based on our knowledge and verification work. Please explain or respond to these specific comments:

Comment 15: Drill holes 199-232 and 253-261 are shown on various diagrams to pass through the ore body, but were not noted as being assayed.

Response 15: *DDH 199-232 and 253-261 were not individually assayed. These borings were generally used to define the margins of the ore body and usually encountered only limited quantities of mineralized rock or were geotechnical borings not used for mineral exploration.*

Comment 16: Drill Holes 74, 98, 165 and 242 were verified as used for acid-base accounting (ABA) testing, but not so noted on Table 3.5-1.

Response 16: *Diamond Drill Holes 74, 98, 165, and 242 had ABA test work conducted on them. The findings of the work will be reported in a status report on the project's waste characterization studies to be filed with WDNR shortly.*

Comment 17: The table shows that Drill Hole 48 was used in waste characterization work, but Drill Hole 49 was verified by DNR as used.

Response 17: *DDH 49 should also have the "WC" box checked in addition to DDH 48. This change will be incorporated into the EIR through an update.*

Comment 18: We understand that Drill holes 262-272, were used for waste characterization, but are not so noted in the table.

Response 18: *DDH 269, 270 and 271 were used for waste characterization as noted in Table 3.5-1. DDH 262-268 and DDH 272 were not used for waste characterization.*

Comment 19: Drill holes 209-217 are recorded as being used for waste characterization, but we cannot substantiate this.

Response 19: *DDH 209-217 were not used for waste characterization. This change will be incorporated into the EIR through an update.*

Comment 20: We recommend that another column be added to note the status of boring/well as open or abandoned.

Response 20: *Comment noted. An addition to this section of the EIR will be included in an update.*

Comment 21: Part 3.5.1.4 and Appendix 3.5-12 - The current status of CMC-01 is not discernable. No abandonment report is given and is not noted as being used.

Response 21: *Well CMC-01 has not been abandoned and remains in existence as noted in Table 3.6-1. However, this well is currently not in use and was not used in the 1994/1995 groundwater quality sampling program.*

Comment 22: Part 3.5.1.5 and Appendix 3.5-13 - A number of drill holes were blind drilled through the saprolite-till contacts and the contact is interpreted. The narrative gives the impression and implies all contacts were picked from recovered intervals. This should be clarified.

Response 22: *Comment noted. A clarification of this section of the EIR will be addressed in an update.*

Comment 23: Part 3.5.1.6 and Appendix 3.5-14 - How were the hydraulic loading rates estimated from logs? There is no explanation or narrative.

Response 23: *The hydraulic loading rates were estimated based on soil texture, structure, and consistency using Table O from ILHR 83.*

Comment 24: Part 3.5.5.3.1, Page 3.5-74, First Paragraph - During verification, it was our understanding that 3" samples were taken every 2 feet for whole core and a 6" sample taken every 2 feet for split core. The EIR narrative states 2" core samples were taken every 2 feet. We need to resolve this discrepancy.

Response 24: *WDNR is correct. The narrative will be changed in the EIR as part of an update.*

Comment 25: The first round of ABA samples taken in the Spring, 1994, were not incorporated into the EIR. CMC needs to explain why the first ABA rounds were not used or include their results into the EIR.

Response 25: *The results of the ABA testing conducted during the spring of 1994 and those conducted during the fall of 1995 will be included in a waste characterization status report that is expected to be submitted to the WDNR shortly.*

Comment 26: The entire borrow needs for the mine facility are not addressed. In order for the DNR to accurately assess impacts, the entire borrow needs (clay and fill) for the facility need to be addressed in detail. If needed materials would be purchased, even if from existing commercial sources, it means that another company will develop a borrow site or enlarge an existing one. To do this adequately would involve identification and characterization of potential borrow sites to meet all needs, regardless of whether a third party may be doing the actual development. This is a requirement for the EIR.

Response 26: *Item to be discussed with WDNR before a final response is provided.*

Comment 27: The discussion on the reinterpretation of the saprolite/bedrock is extremely brief and does not adequately cover the complexity of the situation. This comes following extensive discussions on the Saprolite Report of February, 1995, on which many concerns were raised. CMC indicated that this will be addressed in a forthcoming addendum, or if not, this should be addressed.

Response 27: *This issue was addressed and incorporated into the Groundwater Modeling Report contained in Appendix 4.2-3 of the EIR that was submitted in September 1995. The Saprolite Report contained in Appendix A of the Groundwater Modeling Report is preceded by a memorandum that addresses the reinterpretation of the saprolite.*

A clarification regarding saprolite/bedrock interpretations will be addressed in an update to Section 3.5.

Comment 28: The logs of the drill holes and borings in the facility area no longer have the saprolite thickness annotations that were presented in the Saprolite Report. The nature of the saprolite will play a major role in determining the impacts of the project. CMC has suggested that this will be addressed in a forthcoming addendum.

Response 28: *The drilling logs with the saprolite thickness annotations are contained in the Saprolite Report that has been incorporated into Appendix A of the Groundwater Modeling Report that is provided in Appendix 4.2-3 which was submitted in September 1995.*

Comment 29: The results of the new packer testing must be incorporated into the assessment of the nature of the bedrock. The current information is of limited use without it.

Response 29: *Appendix F of the Groundwater Modeling Report contained in Appendix 4.2-3 presents a Bedrock Packer Test Report that discusses the results of packer tests completed in June and July of 1995. The Bedrock Packer Test Report also evaluates historical bedrock permeability data and presents the most representative value of bedrock permeability for the various bedrock hydrostratigraphic units. These results will be incorporated into Section 3.5 as part of a future update.*

Comment 30: Figure 3.5-47 has a soil type labelled 20D which is not listed on table 3.5-11.

Response 30: *Table 3.2-11 will be updated to reflect the addition of soil type 20D.*

Comment 31: In its current state the EIR does not adequately describe the existing soils environment. There is a varying degree of soils information presented in discrete locations in several documents with no attempt to integrating this information into a comprehensive whole. There is no way to systematically show the baseline condition much less establish that no impacts to soils have occurred. Please integrate the soils discussion into one comprehensive treatment.

Response 31: *Item to be discussed with WDNR before a final response is provided.*

Comment 32: There is substantial information on soils and vegetation and that may be relevant that was submitted as part of the Exxon EIR. If past data is no longer relevant, there should be some discussion as to why it is not. What is needed is some processing of available soils information including existing data - along with new SCS data and proper use and integration of old data to portray a graphical (maps, tables) and narrative to allow the reader to come to some conclusions about the nature, variability, usefulness of the existing resource and how it relates to the kind of topsoil management necessary to assure that reclamation is feasible.

Response 32: *Item to be discussed with WDNR before a final response is provided.*

By presenting soils information in a coordinated manner, CMC should address typical soils concerns pertinent to the existing environment such as:

Comment 33: Evaluating the soil resource to establish whether there is suitable material for reclamation/revegetation purposes;

Response 33: *Item to be discussed with WDNR before a final response is provided.*

Comment 34: Determining the depth of topsoil removal (and perhaps replacement as it relates to the proposed seed mixes) as it varies from location to location on the mine plan area;

Response 34: *Item to be discussed with WDNR before a final response is provided.*

Comment 35: Presenting information on the running soil balances for ongoing reclamation, landscaping needs, corridor work and reclamation of each TMA cell as well as for storage of topsoil for final reclamation of the plant site. Please establish a running inventory of the topsoil resource by the presentation in a chart for each area/ phase/ approximate years of storage.

Response 35: *Item to be discussed with WDNR before a final response is provided.*

Comment 36: Ensuring that there is adequate soil volume based on the depth of topsoil necessary to support the vegetation type(s) in a given location upon consideration of factors such as rooting depth and adequate soil moisture.

Response 36: *Item to be discussed with WDNR before a final response is provided.*

Comment 37: In its discussions, CMC should include soil data needed to address soil compaction and soil characteristics needed to predict soil erosion losses in order to determine whether there would be adverse long-term impacts to the soil resource. Please address soil compaction concerns and tests to determine the baseline bulk and particle density.

Response 37: *Item to be discussed with WDNR before a final response is provided.*

Comment 38: Soil Suitability: There are several parameters that are typically evaluated when considering the suitability of topsoil or alternative soil materials for use in revegetation. Among the criteria that are useful to this project are: soil texture, pH, organic matter %, USLE Water Erodability Factor (K), Wind Erodability Group (WEG), Rock Fragments % (Volume) and perhaps Cation Exchange Capacity. Data on the soil physical and chemical status that are obtained prior to disturbance are needed to allow comparison with the post-mining condition relevant to soil salvage, protection against erosion, and the suitability of the soil resource for reclamation need to be developed before an adequate determination of the effects of the project on the soil resources portion of the existing environment can be ascertained.

Response 38: *Item to be discussed with WDNR before a final response is provided.*

Comment 39: In order to allow the Department to determine project impacts, all soils data should be integrated for the purpose of developing a soil removal and salvage map and coordinated with the soil balances, needs for reclamation and contemporaneous use versus stockpiling. This soil stripping or isopach results from the interpretation of existing valid soils data.

Response 39: *Item to be discussed with WDNR before a final response is provided.*

Comment 40: Please generate a topsoil stripping map. This is necessary to determine if there would be adverse long-term impacts from failing to recover the available soil resource.

Response 40: *Item to be discussed with WDNR before a final response is provided.*

Comment 41: The relationship of topsoil management and TMA reclamation is difficult to ascertain as there is scant information available. The reader is referred to other documents, but topsoil management in this portion of the project is never really addressed. Please address this.

Response 41: *Item to be discussed with WDNR before a final response is provided.*

Comment 42: What happens to the topsoil stockpile when additional TMA cells are developed?

Response 42: *Item to be discussed with WDNR before a final response is provided.*

Comment 43: Facility Impact to Vegetation and Relationship to Soils: The EIR should show the acreage impacted within each vegetation type and relate this to the soil series/associations matched with the vegetation type. This would allow an assessment of the impacts to a given vegetation type

that are connected to the soil management plan. CMC should describe each area in terms of whether the expected impacts are immediate or phased in.

Response 43: *Item to be discussed with WDNR before a final response is provided.*

Comment 44: There is little mention of wetland (hydric) soils with respect to their management and how it fits in with final reclamation. Although a seed mix is presented in the MPA to address final reclamation needs, there is no connection to the salvage, stockpiling, segregation and redistribution of hydric soils.

Response 44: *Item to be discussed with WDNR before a final response is provided.*

Comment 45: The engineering approach to topsoil management described in the EIR and the Mine Permit Application would create a uniform relatively homogenous (in theory) soil material that could be used anywhere on the mine plan area for any purpose. How does [sic] this relate to the reestablishment of the existing plant associations and would the productivity of these plant communities be reasonably similar in this new engineered soil material?

Response 45: *Item to be discussed with WDNR before a final response is provided.*

3.6 Groundwater

Comment 46: The site-specific water table maps presented are unacceptable. The Department and CMC's consultant reached an agreement, contingent on the content of recalculated vertical gradients, on the acceptable content of revised 1984/1986 water table maps. The creation of piezometric surface elevation maps for one or more of the hydrostratigraphic units may be possible, and if so, should be completed for the same dates as the water table maps. In addition, a new water map based on 1995 data is necessary. CMC has said that this information will be forthcoming.

Response 46: *The requested information and revisions were provided to the WDNR on August 2, 1995. This information will be incorporated into the EIR through an update.*

Comment 47: The lake bed continuity assessment partially consisted of a TDEM survey which can elucidate stratigraphic layers of contrasting electrical properties. It cannot actually determine the nature of the stratigraphic layers - only some of its physical properties. During discussions, CMC agreed that the exact nature of the "geoelectric" layers was not known for certain, and that a geoelectric layer designation would be used for the results from the survey in the future. This was not done in the EIR and should be changed for the sake of clarity. The TDEM survey did not determine the thickness of the "clay layer."

Response 47: *This comment appears to deal more with semantics than scientific differences of opinion. The TDEM survey was calibrated to a target layer that consisted of the silty clay and silt deposits that form the beds of the surveyed lakes. Soil borings were used as calibration targets. The low resistivity of geo-electric layer 2 correlates to the silty clay and silt deposits that form the lake bed. Thus the isopachs of geo-electric layer 2 are a representation of the thickness and continuity of silty clay and silt deposits that form the lake beds. To prevent confusion within the general public we presented the discussion of geo-electric layer 2 in the context of its correlation to the silty clay and silt deposits. Moreover, given the fine grained nature and low permeability of the silt and clay deposits there is sound justification for correlating the silty clay and silt deposits to the low resistivity layer (geo-electric layer 2). This position is supported by recent published studies that have shown a strong correlation between geo-electric*

properties of lake bed sediments and lake bed leakance, which is strongly influenced by soil type. Bradbury and Taylor (1985) showed a positive relationship between lake bed leakance and geo-electric properties. This relationship was corroborated by Cherkauer et al. (1987) who concluded that it is possible to geophysically determine lake bed leakance. Given this evidence CMC chooses to retain the discussion of the TDEM survey as it currently appears in the EIR.

Comment 48: The TDEM survey showed a substantial degree of variability in its ability to estimate stratigraphic layer thicknesses. The discussion as to the reasons for this variability is lacking and needs to be enhanced.

Response 48: *Comment noted. An addition to this section of the EIR will be included in an update.*

Comment 49: Area lake outlet elevations are presented in an appendix from 1985. This information needs to be verified as accurate for current conditions due to its importance in verifying the water balance/lake stage calculations done for the modeling effort. We know that the outlets on some of the lakes are affected by beaver dams.

Response 49: *For the current environmental studies, the outlet elevation is an important parameter in the calibration of the groundwater model. The regional groundwater model has been calibrated to conditions in 1984 and the drought of the late 1980's. Given the time period for calibration, the 1985 survey data for the outlet elevation is the correct information to use. Resurveying the outlet elevation would have little bearing on the groundwater modeling studies since the information would not be used for calibration purposes.*

Comment 50: CMC's conclusions regarding the lack of penetration of meteoric water to depth in the bedrock are not conclusive. If additional chemical sampling was done during the packer testing, that should assist to draw more substantial conclusions.

Response 50: *This issue was addressed in the memorandum that is attached to the Saprolite Report that is included in Appendix A of the Groundwater Modeling Report. The Groundwater Modeling Report is provided in Appendix 4.2-3.*

Comment 51: There are known perched groundwater systems located in the area of the site and likely many unknown perched systems. These systems, if shallow, often are connected to nearby surface waters and may also be draining to the regional system. The report does not discuss perched systems except in regards to lakes or wetlands specifically. These perched systems could impact construction and may impact the hydrology of specific wetlands, lakes, and streams if affected by construction (excavation, penetration, cutting off from recharge by roads, liners, etc.), and may affect contaminant transport from the TMA. Identification of known perched systems, some indication of the likelihood of additional systems being present, and some discussion of impacts should be presented in the EIR.

Response 51: *Comment noted. An addition to this section of the EIR will be included in an update.*

Comment 52: The EIR discusses the impacts on wetlands that will be filled from the project, but does not adequately discuss the impacts on wetlands adjacent to constructed facilities. These impacts could come from changes to associated perched systems (as discussed above) or diversions of surface water. One wetland in particular that would be affected is the burr oak wetland, located just north of the proposed TMA. A significant portion of its watershed will be captured by the TMA.

Response 52: *Secondary, or indirect, impacts to wetlands are discussed in Section 4.2.7.3 of the EIR.*

Comment 53: Some of the regional figures need to be revised. Specifically, figures 3.5-18 (Regional Bedrock Contour Map) and 3.6-46 (Isopach of Depth from Ground Surface to Groundwater Surface) need work. The regional bedrock map shows closed depressions on an erosional surface that are suggestive of karst. The depth to water table map is missing several 0' contours or are not consistent in the area of some of the recharge lakes.

Response 53: *It is not clear how a depression in the bedrock surface suggests a karst environment. Northern Minnesota and Canada are replete with many lakes that reside in significant bedrock depressions of the Canadian Shield, which has been extensively eroded. With respect to the isopach map, the suggested changes will be incorporated into the EIR through an update.*

Comment 54: On Figure 3.6-11, the contour close to Rollingstone [sic] Lake should be 1540, not 1550.

Response 54: *Comment noted. A revision to this figure will be included in an update to the EIR.*

Comment 55: Figure 3.6-11 (potentiometric surface) has no control points to the east and south of the project site. The interpretation depicted on the map is not consistent with the model boundary conditions.

Response 55: *Comment noted. Control points based on USGS topographic maps will be added to the figure and revised contours generated. The revised figure will be included in an update to the EIR.*

The following comments pertain to 3.6.2 Domestic Water Well Inventory:

Comment 56: CMC should continue to attempt to obtain missing information from the domestic water well inventory. This includes continuing to obtain information for wells which no information has been obtained to date as well as filling in missing information from partially-inventoried wells. At some point, it will be necessary for field measurements to be made to obtain the missing information. It is particularly important to obtain information regarding the static water level and pumping water levels for the wells wherever possible. The resulting water levels will determine whether a detrimental effect might occur to a particular well. Otherwise, impact assessments will have to be based upon assumptions regarding a particular well's static and pumping water levels.

Response 56: *Item to be discussed with WDNR before a final response is provided.*

Comment 57: CMC has limited its investigation of domestic water well to wells in what were previously identified as Zone 1, the area which was predicted to have a drawdown of 3 feet or more. Because wells could be negatively impacted by a groundwater drawdown of even a foot or two, depending on the characteristics of the well, the pump and groundwater, representative sampling of wells in zone 2 also should be conducted.

Response 57: *Item to be discussed with WDNR before a final response is provided.*

Comment 58: Depending upon the final extent of predicted and actual mine dewatering effects it may be necessary to expand the well water inventory into all of Zones 2 and 3. Also, potential water quality impacts to private well users resulting from mine dewatering and other site activities has been largely ignored. Reversals in groundwater gradients and resulting induced infiltration from surface water sources or other contamination sources on the site have a potential to change and/or adversely affect well water quality. Eventually, this potential must be addressed and evaluated together with any mitigative measures that may be implied. Such an evaluation will ultimately require collection of baseline water quality data from private wells. CMC should begin to develop a proposed baseline water quality sampling program for private wells in the mine area and suggest mitigative measures to be implemented in the event mining activities cause private well water quality or quantity problems.

Response 58: *Item to be discussed with WDNR before a final response is provided.*

Comment 59: Figure 3.6-8 shows a potable water well to provide potable water for the mining facilities. No discussion or description of the proposed potable well was included in the EIR. It may well be included in the high capacity well approval, however, it should also be included briefly in the EIR.

Response 59: *This issue was addressed in a September 25, 1995, update to the project's MPA. Section 4.8.11.9 of that document can be referred to for details regarding this well.*

Comment 60: If any wells in the area of groundwater drawdown would be deepened into the bedrock aquifer, the water from such a well should be tested for contents prior to use as a drinking source.

Response 60: *Based on the predicted drawdown discussed in Section 4.2.5 of the EIR, no wells will need to be deepened into the bedrock.*

Comment 61: Section 3.6.1.3: The report does not indicate if the existing monitoring points were resurveyed for horizontal control. Please indicate if surveying has been done and the approximate date of surveying.

Response 61: *Wells installed for 1994 and 1995 studies were surveyed as part of field work. Wells installed previous to this time were not resurveyed.*

3.7 Surface Water and Bottom Sediments

Comment 62: 3.7.7.2 p.3.7-92: This section is not clear as to the purpose of the analysis included in the associated appendix. On one hand the section infers that the purpose is to conduct an evaluation of wetland hydrology, while the real focus appears to be solely on the modelling of spring run-off and snowmelt. Determination of existing wetland water budgets is necessary so that before/during/after evaluations can be conducted to determine the impact of the proposed action. Is it fair to say that the analysis presented in this section and Appendix 3.7-12 is only to gather the "surface water input" component of the water budgets? The surface water hydrology plus groundwater model information will be used together to evaluate impacts to wetland hydrology.

Response 62: *WDNR's interpretation in the last two sentences of the comment is correct. The before/during/after evaluations have been conducted and are discussed in Section 4.2.7 of the EIR.*

Comment 63: Appendix 3.7-12: 3.7-12-1/1: The memorandum states that an evaluation of existing wetland hydrology is needed in order to minimize the impacts. It appears that this appendix includes the surface water portion of the water budgets for the study area. In order to complete the evaluation of the impacts, we will need the full water budget and associated hydroperiod model (an average or range) for existing conditions. With such information, the analysis of the impacts of intercepting run-off, diverting flows, blocking flows, lowering the water table, mitigating water levels, etc. can be evaluated (i.e., the construction and post-construction phase scenarios).

Response 63: *Direct, temporary, and indirect impacts to wetlands are discussed in Section 4.2.7 of the EIR. The purpose of Appendix 3.7-12 was to provide baseline (existing conditions) information regarding wetland surface flows.*

Comment 64: 3.7-12-4/1: This concept of "cumulative run-off" needs clarification. The model should look at surface water run-off entering a given wetland basin from its surrounding watershed. Obviously, the surface water watershed for a given wetland is defined as the total land area that is providing surface water run-off. Because some wetlands will receive flow from outlets from adjacent basins, it may be necessary to include run-off from other wetlands as well. It appears that this is what the model is accounting for, but the description is confusing.

Response 64: *Cumulative runoff represents the total surface water contribution to a specific wetland's hydrology. The model takes into account surface water runoff entering a given wetland basin from its entire surrounding watershed. For those cases where the wetland's watershed includes an upstream wetland, the model carries the results of the upstream analysis to the downstream wetland rather than recalculating the upstream runoff as a single basin. Therefore, in those cases where wetlands are interconnected, the analysis begins with the upstream wetland and its surrounding watershed.*

Comment 65: 3.7-12-6/3: Related to the comment above, why is a distinction made between "upland run-off" and "wetland run-off", if the term being modelled is surface run-off entering the wetland? The example seems to be saying that the run-off from wetland F15 is 41.32 ac-ft. The model should show surface run-off into each wetland. For some named wetlands, which were split for ease of functional value assessment analysis, runoff should be calculated for the entire wetland.

Response 65: *Upland runoff represents runoff to a wetland from areas outside the wetland's perimeter. Wetland runoff represents that runoff that originates within the perimeter of the wetland. Wetland hydrology for a wetland must include both the runoff generated from upgradient uplands and that generated by the wetland area itself. Because characteristics affecting runoff generation differ significantly between uplands and wetlands, runoff was calculated separately to achieve more accurate results for each wetland watershed.*

For those wetlands without an outlet, the calculated runoff represents the total surface water contribution to the wetland's hydrology both from upland and wetland areas. Wetland F15, for example, falls into this category. For wetlands that are connected to an upstream wetland, the model assumes that all generated runoff from the upstream wetland and associated upland will be discharged to the downstream wetland. This value is then added to the upland and wetland runoff calculated for the downstream wetland. In this way, the total surface water runoff volumes from both upstream wetland watersheds and downstream wetland systems can be properly accounted for.

Comment 66: 3.7-12-6/2: The analysis provides water budget output for "selected" wetlands which could be potentially impacted by TMA or plant site activities. Figures 1 and 2 should include

wetland names. Second, are all the wetlands that may be impacted, either directly or indirectly, included in this list?

Response 66: *An evaluation of impacts to wetland hydrology is presented in Section 4.2.7 and Appendix 4.2-5 of the EIR. The appendix contains Figures 1 and 2 with wetland names included. The impacts analysis addresses direct, temporary, and indirect impacts to those wetlands that may be impacted by the project.*

Comment 67: p.3.7-17: The definition and discussion of seepage lakes are not consistent. Actually, what is defined is a spring lake. Contrast the definition of seepage lakes with that in Wisconsin Lakes, 1995, p.1: "Seepage Lakes - These lakes do not have an inlet or an outlet, and only occasionally overflow. As landlocked water bodies, the principal source of water is precipitation or runoff, supplemented by groundwater from the immediate drainage area. Since seepage lakes commonly reflect groundwater levels and rainfall patterns, water levels may fluctuate seasonally. Seepage lakes are the most common lake type in Wisconsin."

Response 67: *Comment noted. A clarification of this section of the EIR will be addressed in an update.*

Comment 68: Numerous water quality data from the 1970's and 1980's indicate metals concentrations. However, these data were gathered and analyzed prior to the clean techniques recently developed. Please evaluate the usefulness of these data, discussing limitations, in those terms.

Response 68: *Comment noted. A discussion of this topic will be included in an update to the EIR.*

Comment 69: p. 3.7-16: In regard to the average annual suspended sediment yield of 10 tons per square mile, we believe CMC should use actual data from comparable Northern Highland streams rather than use this regional average prediction.

Response 69: *The Hindall report referenced in the EIR does not contain specific sediment yield information for the streams in the Crandon Project area, nor is CMC aware of other published documents which contain specific information. The average information referenced on page 3.7-16 of the EIR was provided to represent regional sediment yields. The regional value provides a good indication of sediment yield in the area. The information is not used in the EIR for any purpose other than that for which it was provided. Therefore, CMC sees no value in attempting to generate stream specific information. If the WDNR has stream specific information at its disposal, CMC would incorporate it into the EIR.*

Comment 70: From Table 3.7-25: the dissolved solids mean of 53 mg/L for 1977-78 is very high compared to the 1994 mean of 13. Why are they so different? Are both of these figures accurate? Is one an anomaly?

Response 70: *Comment noted. A discussion of this topic will be included in an update to the EIR.*

Comment 71: Table 3.7-28: The total phosphorus mean for 1977-78 in Rollingstone [sic] Lake is 0.03 mg/L, while the 1994 mean is 0.218. The later [sic] is much higher than DNR data and is not representative of the lake characteristics. Please explain.

Response 71: *Comment noted. A discussion of this topic will be included in an update to the EIR.*

Comment 72: p. 3.7-83: "Dissolved oxygen concentrations were above 5 mg/L in the Wolf River at both sites...." The next sentence indicates the oxygen values were between 10.9 and 2.8 mg/L, a contradiction of the first sentence. Please explain.

Response 72: *Comment noted. A clarification of this section of the EIR will be addressed in an update.*

3.8 Aquatic Biology

3.8.2.4 Results of Aquatic Macrophyte Collections (1977-78)

Comment 73: The vegetation of the water bodies in this section is described only on the basis of the earlier (1970's) plant collecting work. The lake plant descriptions should be updated based on the most recent plant collecting efforts. For example, it appears that the Duck Lake populations of algal-leaved pondweed (*Potamogeton confervoides*) no longer occurs there, which is not the case.

Response 73: *The purpose of Section 3.8.2.4 was to bring forward the work conducted by previous investigators regarding general aquatic vegetation communities existing in area lakes. The results of the 1994 and 1995 aquatic vegetation surveys are discussed fully in Sections 3.9.3, 3.9.5, 4.2.9.1 and 4.2.9.3.5.*

Comment 74: p. 3.8-78: At Deep Hole Lake, *Elatine minima* is one of the submerged plants, while at Little Sand Lake, *E. triandra* was identified. Is this correct?

Response 74: *The results presented in Section 3.8.2.4 are based on the work of the previous investigators and represent conditions observed in the late 1970's and early 1980's. Data sheets from the 1994 surveys of these lakes will be reviewed to determine if either of these plants were observed in 1994. The EIR will be modified, if necessary, based on this review.*

Comment 75: 3.8.2.9: The fish survey by CMC consultants in 1994 concentrated on searching for threatened and endangered species in areas surrounding the proposed mine site. Data collection and reporting appear adequate to that purpose. However, there is a need for additional fish survey work in the area of the proposed mine site. Past fish survey work by DNR and CMC's consultants during the last permitting process was extensive. Several environmental events including a major drought in 1988-90 and changes in location and extent of beaver dams on area streams may well have contributed to changes in fish communities in the waters previously surveyed. Current (1994) fish survey work by CMC consultants was confined to May and June sampling and focused on threatened and endangered species, and may not have been adequate to detect such changes. While it is not necessary to repeat the entire past survey work, we request that CMC's consultants repeat intensive lake and stream surveys at several selected sites to cross check species composition and relative abundance since the previous surveys. Prior to such sampling, CMC's consultants should contact the Woodruff office so we can provide recommended sampling sites.

Response 75: *Item to be discussed with WDNR before a final response is provided.*

Comment 76: The recent proposal to discharge waste water to the Wisconsin River at Hat Rapids raises potential fish sampling needs not addressed to this point. Fish community composition (species presence and relative abundance), growth of selected fish species, length frequencies and fish tissue analysis for metals as was done at the proposed mine site should be measured at a minimum of one site downstream from the proposed discharge site. Please notify fisheries personnel at Woodruff prior to sampling to allow observation of data collection.

Response 76: *Item to be discussed with WDNR before a final response is provided.*

Comment 77: Table 3.8-57. *Pleurobema sintoxia* and *Pleurobema coccineum* are synonymous, and information for these should be combined under *Pleurobema coccineum*.

Response 77: *Comment noted. A clarification of this section of the EIR will be addressed in an update.*

Comment 78: Section 3.8.3.5., in the paragraph beginning "Some threatened and endangered species are not expect to be found..." There are no records of the bullhead mussel (*Plethobasus cyphus*) from the lower Wolf River. Reference to this is clearly in error. Listed mussel species that occur in the lower Wolf River include snuffbox (*Epioblasma triquetra*), salamander mussel (*Simpsonaias ambigua*), slippershell (*Alasmidonta viridis*) and buckhorn (*Tritogonia verrucosa*).

Response 78: *Comment noted. A clarification of this section of the EIR will be addressed in an update.*

Comment 79: I see no discussion under the significance of the mussel findings that addresses the functional contribution of aquatic biota to these aquatic systems. This discussion should be included and should encompass findings from all taxonomic groups including fish, mollusks, insects and others.

Response 79: *Item to be discussed with WDNR before a final response is provided.*

3.9 Terrestrial Biology

Comment 80: 3.9-36/5: Discussions during a site visit in September 1994 centered on whether or not the oaks in Bur [sic] Oak Swamp were actually *Quercus macrocarpa*, but rather *Q. bicolor*, Swamp White Oak, which has acorns on stems, some of which were observed. Did the botanists check these trees? The data sheets in CMC-NOI-161 show *Q. muehlenbergii* as the oaks in F15. This species is not known to occur far from the Mississippi River bluffs in the southwestern portion of the state.

Response 80: *A general description of the flora existing in the Burr Oak Swamp, based on the 1994 botanical surveys, is presented in Section 3.9.6.3 of the EIR. Although the focus of the 1994 botanical surveys was not on common species, Quercus macrocarpa was observed in the Burr Oak Swamp. It was noted that some of the specimens observed in this area did not exhibit the classic Q. macrocarpa morphology, however, it is not unusual for Q. macrocarpa to be found in wet soils, particularly in the north. Upon further review, it has been determined that Q. muehlenbergii was likely misidentified on the data sheets contained in CMC-NOI-161.*

Comment 81: 3.9-37/2: What is meant by a "good bog"? Does this mean one with a diversity of species?

Response 81: *The term "good bog," as used in the EIR, is one with a diversity of plant species typically expected to exist in bogs with classic bog morphology. This term will be defined more clearly in an update to the EIR.*

General Comment: Endangered and threatened species: In the future, should additional sites for endangered or threatened species be located, the exact locations should not be released or reproduced in publicly disseminated documents.

General Response: *Comment noted.*

Section 3.9.1.2 Mammals

Editorial comments: p.3.9-6: Otter should be Lutra, not Lontra; Wydeven is misspelled; p. 3.9-82: Wydeven is misspelled in two places; p. 3.9-82 Dhuey 1994 is cited, but should read Ashbrenner 1994. Dhuey is the compiler/editor of the Wisconsin Wildlife Surveys, but Ashbrenner was the author of the article to which the reference was made; p. 3.9-83: "Dhuey 1988" should be "Kohn and Ashbrenner 1993", and "Dhuey 1993" should also be "Kohn and Ashbrenner 1993."

Response: *Comments noted. A clarification of this section of the EIR will be addressed in an update.*

Comment 82: Under the section on bobcat, it is stated that "Evidence of bobcat, in the form of tracks, was observed on several occasions...." It would be better to indicate actual number of track sets observed and total of miles surveyed.

Response 82: *Comment noted. An addition to this section of the EIR will be addressed in an update.*

Comment 83: p.3.9-83: In the discussion of pine marten, the number and species of other carnivores caught in live traps should be listed as an indication that traps were working properly for capturing small and medium-sized carnivores.

Response 83: *Comment noted. An addition to this section of the EIR will be addressed in an update.*

Comment 84: p.3.9-84: In the section on pygmy shrew, "Thompson's" can be dropped because the sub-species does not occur in northern Wisconsin.

Response 84: *Comment noted. A clarification of this section of the EIR will be addressed in an update.*

Comment 85: The total number of specimens caught are not listed under pygmy shrew. Instead of stating "Highest numbers were recorded at pit trap stations 2, 3, 11 and 12", actual numbers trapped at each station should be listed.

Response 85: *Comment noted. An addition to this section of the EIR will be addressed in an update.*

Comment 86: It would be very useful in the mammal section to have a table that shows actual numbers of all small mammals trapped and show rates for various trap types used. Under individual small mammals, it would be useful to list the number of voucher specimens prepared, museum where they were deposited, and museum identification number of each voucher specimen.

Response 86: *Comment noted. An addition to this section of the EIR will be addressed in an update. Due to the large number of specimens collected, specimen preparation is on-going. All specimens, in many cases only skulls, will be maintained as vouchers at the Richter Museum of Natural History at the University of Wisconsin - Green Bay. A complete listing of vouchers will be provided when specimen preparation and cataloging is complete.*

Comment 87: Please revise the bald eagle and osprey section. It is best to use actual DNR nest numbers to identify nests. The numbers are on the table which follows shortly.

Response 87: *Comment noted. An addition to this section of the EIR will be addressed in an update.*

Comment 88: Please revise Map 3.9-17 by using the following information:

Map 3.9-17 shows the environmental study area. In this area in 1994 WDNR aerial surveys identified 9 occupied bald eagle territories (Eckstein 1994a). Each territory may have one or more former nest sites and one or more alternate nest sites. The 1994 WDNR aerial survey found the following:

<u>Nest</u>	<u>Name</u>	<u>April Check</u>	<u>June Check</u>
LA02A	Spider Creek Flow.	Occupied	Failed
LA02B	Spider Creek Flow. SE	Empty, unrepaired	--
LA03A	Rolling Stone Lake	Gone many years	--
LA03B	Rolling Stone Lake	Incubating	Failed
LA03C	Rolling Stone Lake	--	New empty nest
LA05C	Pickerel Lake	Incubating	Failed
LA12	Hunting River	Empty, unrepaired	--
LA12A	Wolf River Pond	Incubating	Failed
ON56	Lucille Lake	Incubating	1 young
FO01A	Rice Lake	Gone many years	--
FO01B		Gone many years	--
FO01C		Gone many years	--
FO01D		Gone many years	--
FO01E		Incubating	1 young
FO13B	Lake Lucerne	Incubating	2 young
FO16B	Bishop Lake	Occupied	Failed
FO19	Copper Mine	Gone many years	--
FO23	Arbutus Lake	Empty, unrepaired	--
FO23A	Crane Lake	Gone, blowout	--
FO23B	Crane Lake	Incubating	Failed

Response 88: *Comment noted. Map 3.9-17 will be revised as indicated and included in an update to the EIR.*

Comment 89: Page 3.9-91. Under 3.9.5.3.3 Northern Goshawk. In the first paragraph eliminate the phrases "...especially on county and some state lands.." and "...all geared for rapid pulp production...."

Response 89: *Comment noted. Page 3.9-91 will be modified as indicated through an update to the EIR.*

Comment 90: Page 3.9-103. Under 3.9.5.5.2 The second sentence does not make sense; please revise. Also in that paragraph "McNoughton" should be "McNaughton".

Response 90: *Comments noted. Page 3.9-103 will be modified as indicated through an update to the EIR.*

Comment 91: Page 3.9-111. Under Howe et al. 1994 replace "Dervice" with "Service".

Response 91: *Comment noted. Page 3.9-111 will be modified as indicated through an update to the EIR.*

Comment 92: Revise the second paragraph beginning "There are seven known eagle nests..." with the updated material in the above table.

Response 92: *Comment noted. A revision of this section of the EIR will be addressed in an update.*

Comment 93: Page 3.9-89, the bottom paragraph: Replace the sentence beginning "An inspection of the area..." with "An inspection of the area around the nest north of Rolling Stone Lake revealed that this nest produced no young in 1994."

Response 93: *Comment noted. Page 3.9-89 will be modified as indicated through an update to the EIR.*

Comment 94: Page 3.9-90. Please revise the second paragraph beginning "Eckstein (1994b), reported..." with: Map 3.9-17 shows the environmental study area. In this area in 1994 DNR aerial surveys identified 5 active osprey territories (Eckstein 1994b). One territory, FO01, has two nest sites.

<u>Nest</u>	<u>Name</u>	<u>May Check</u>	<u>July Check</u>
LA02A	Miniwakin Snag	Inactive, nest present	--
LA04A	Spider Flow. Platform	Incubating	Failed
LA06	Pickrel Lake Platform	Used by Great blue herons	--
LA11A	Spider Flowage Platform	Inactive	--
LA12B	Rolling Stone L. Platf.	Incubating	2 young
FO01A	Swamp Creek Platform	Empty, nest unrepaired	--
FO01B	Swamp Creek Pole	Incubating	Failed
FO02A	Ground Hemlock Lake	Gone many years	--
FO05	Mole Lake Platform	Incubating	2 young
ON91	Bishop Lake Trust Land	Incubating	1 young

Response 94: *Comment noted. Page 3.9-90 will be modified as indicated through an update to the EIR.*

Comment 95: Table 3.9-21 (Herptile Collection List) differs from Table 3.9-22 (Master Herptile Species List) in that four species are missing from the former. These are chorus frog, snapping turtle, painted turtle, and smooth green snake. Please revise.

Response 95: *Table 3.9-21 (Herptile Collection List) presents a list of collected herptile specimens whereas Table 3.9-22 (Master Herptile Species List) presents a list of all observed herptile specimens. All observed herptiles were not collected. As such, no revisions are necessary.*

Section 3.9.3.10 Heavy Metals in Vegetation:

Comment 96: Table 3.9-15 requires further explanation. It would appear that the detection/reporting limits for these metals was more precise in 1977 compared with 1994. Given the improvement in sampling techniques and lab analysis since 1977, these results are puzzling. Furthermore, the reporting limit varies between sectors. For example, mercury values range from less than 110 mg/kg to less than 140 mg/kg, and arsenic values range from a stated composite value of 0.09 to 0.65 mg/kg. Why is the Pennsylvania sedge 1994 west composite arsenic concentration reported as less than 0.400? This value is obviously between the stated high and low values. Why is the imprecise less than 0.400 value reported rather than a specific value for this composite?

Response 96: *The analytical methods for the 1994 analyses and the target reporting limits were specified in Table 5-2 of the project's quality assurance plan which was appended to the project's NOI/SOS. The target reporting limits were set based on how the data would be used, not based on the lowest detection limit achievable. This is standard practice given the variety of analytical methods available.*

To address the comment regarding the variability of reporting limits between sectors, the following table has been prepared. The table shows the actual reported detection limit for each metal. The variability in the reported detection limits ranged from zero to 0.03 mg/kg which, given the matrix, is good.

The 0.40 to 0.42 mg/kg detection limits reported for arsenic are the result of the need for a fivefold dilution for three arsenic tests. The need for the dilution resulted from matrix interferences.

Analyte	Reported Detection Limit (mg/kg)
Arsenic	0.08 - 0.09 (0.40 - 0.42) ¹
Cadmium	0.12 - 0.13
Chromium	0.12 - 0.13
Cobalt	0.13 - 0.14
Copper	0.12
Lead	0.08
Manganese	0.01
Mercury	0.11 - 0.14
Zinc	0.06

¹Matrix interference required a fivefold dilution for three arsenic tests.

Comment 97: In regard to the data on plant tissue analysis in 3.9.3.10, please provide data on heavy metal levels from the literature which provide anticipated background ranges for these species and soils.

Response 97: *Comment noted. An addition to this section of the EIR will be addressed in an update.*

Comment 98: The 1982 Exxon EIR has a rationale as to why the specific plant species were selected, the collection, sample preparation (including how the compositing procedure was done) and methods of analysis. Is one of the purposes of the study to determine if metals generated during the life of the project have resulted in a perceptible increase in soils levels as reflected by plant uptake? Is their purpose either in part or as a whole to validate the existing data base? There is no narrative addressing these questions. There should be a comparison with the EXXON, 1982 data and any other information that was provided at that time to assess the validity of the data. Please include an expanded discussion of this section in the EIR.

Response 98: *Comment noted. An addition to this section of the EIR will be addressed in an update.*

Comment 99: In the SOS/NOI on p. 45 there is a paragraph on the tissue metals sampling including species, sampling locations and the species or plant types (sedge, raspberry and balsam fir). There should be some reference as to why these species were originally chosen should be compared along with other data that exists in the literature [sic].

Response 99: *Comment noted. An addition to this section of the EIR will be addressed in an update.*

Comment 100: Its [sic] hard to determine if the samples were actually taken in the fashion described in the SOS/NOI. In fact, without some narrative as to purpose, procedures and connection to previous data or previous objectives, it is hard to determine just how the data are to be used.

Response 100: *Comment noted. An addition to this section of the EIR will be addressed in an update.*

Comment 101: Based on these data presented in 3.9-4 of vol. 9 of the EIR, it is hard to determine if the samples represent composites, if each of the sectors was sampled and if the number of individual samples reflected what was proposed in the SOS/NOI. From the SOS/NOI it appeared that there would be individual samples taken and data presented in addition to the composites. The data presented in the EIR do not seem to reflect this.

Response 101: *Comment noted. A clarification of this section of the EIR will be addressed in an update.*

3.10 Wetlands

Comment 102: p. 3.10-1: This section needs to clearly outline the documents that contain the wetland information. Since much of the work was done in the 1980's, the current EIR must explain which information was updated and which remains as documented in 1983.

Response 102: *Comment noted. An addition to this section of the EIR will be addressed in an update.*

Comment 103: p. 3.10-3: As stated above, the EIR needs to be clear as to the location of information used in the report. Functional value assessment was conducted for 174 wetlands. For 158 of those, the information is included in 1980s reports-- 127 wetlands are covered in NAI and

IEP (May 1982 a through d) (also known as CMC-NOI-160 to 163); and 31 are covered in IEP(August 1983) (also known as CMC-NOI-164). It is unclear where the information for the remaining 16, evaluated in 1995, is located.

Response 103: *Comment noted. A clarification of this section of the EIR will be addressed in an update.*

Comment 104: Reference is made to Appendix 3.10-4 which has two tables including summary information on 127 and 20 wetlands respectively. It is not clear whether the information in this appendix has been updated or is merely a reprint of the 1982 and 1983 work. Further, this appendix covers 147 of 174 wetlands in the study area without explanation of why the others are not evaluated. A simple explanation of the location and source of the various tables of information would save a great deal of searching through several documents.

Response 104: *Comment noted. A clarification of this section of the EIR will be addressed in an update.*

Comment 105: p. 3.10-4: This section should reference section 3.7.7.2 and Appendix 3.7-12 which provide details on surface water budgets for "selected" wetlands. What is meant by "surface water budgets of the study area wetlands are relatively low"?

Response 105: *Comments noted. The discussion on this page will be modified through an update to the EIR addressing the requested reference and clarifying the meaning of the referenced phrase.*

Comment 106: Appendix 3.10-3: p.3.10-3-3/4: This paragraph explains that the configuration of the plant site and TMA has changed since the accompanying figures for the delineation verification study were developed. Is Table 1 (page 3.10-3-10) accurate or is it also based on the older design proposal?

Response 106: *Table 1 on page 3.10-3-10 of Appendix 3.10-3 presents quantities representative of the Mine/Mill Site and Tailings Management Area current as of July 21, 1994. The "final" wetland acreage quantities are presented in Section 4.2.7.1 of the EIR.*

Comment 107: p. 3.10-3-5 and 3.10-3-6: These figures are a bit confusing. It is difficult to differentiate between the dashed line representing "Wetland boundary determined by FVD in 1994 based on review of aerial photography and field reconnaissance" and the dashed line representing "Wetland boundary based on field delineation...." What is the importance of the former of these two? The text explains the use of the 1994 field delineation and surveying to compare to 1980's mapping.

Response 107: *The July 21, 1994 letter to Dave Ballman from CMC (beginning on page 3.10-3-8 of Appendix 3.10-3) presented a proposed scope of work for the verification of the wetland mapping work conducted in the early 1980's. CMC proposed to delineate wetlands F65, F64, and M3 in the TMA and wetland 5 and P2 in the plant site. Only that portion of wetland P2 existing within the footprint of the plant site was physically delineated. Although CMC did not propose to delineate wetland F66, the southern portion of this wetland was physically delineated to "tie together" wetlands F66 and F65. The dashed lines representing the wetland boundary determined by review of aerial photography and field reconnaissance, shown on Figures 1A and 1B, connect the previously mapped wetland boundary with the physically delineated boundary surveyed by Foth & Van Dyke in 1994.*

3.11 Ambient Noise and Vibration

General Comment: This section describes existing noise and vibrations in the study area. We will have substantive comments following our review of the forthcoming impact analysis. We will look for a discussion of the sound and vibration sources during construction and operations, a comparison of winter versus summer noise attenuation, noise and vibration impact analysis, likely responses to residents and others who are subjected to the noise and vibrations, and alternatives to mitigate noise and vibration impacts.

General Response: *The discussion of mine-related noise and vibration in Section 4.2.10 of the EIR should address the comments made.*

3.12 Land Use and Zoning

Comment 108: In this section, please add in 3.12.3 another category, Native American Reservation, and describe the Mole Lake Band of the Sokaogon Chippewa as a special land use category. Indicate that Rice Lake is a special example of an important land use type for harvesting wild rice and for religious purposes. Also indicate that fish and game harvesting and plant harvesting for medicinal purposes occurs on the reservation. Mention in this section that the Native Americans have off-reservation hunting and gathering rights on public property. Please include other appropriate descriptors as well.

Response 108: *Comment noted. An addition to this section of the EIR will be addressed in an update.*

3.13 Aesthetics

Comment 109: In most cases, the views described in the Schreiber/Anderson 1985 report are limited by 50 to 70 foot high forests rather than by topographic obstructions. CMC has purchased, optioned or leased extensive amounts of property for buffer purposes. In some instances these acquisitions have not included timber rights. We therefore can not assume that the timber will be managed for it's [sic] aesthetic values in the buffer areas. Please provide a statement regarding CMC's land position in this regard and your ability/commitment to manage timber stands on property controlled by the company for aesthetic purposes where appropriate.

Response 109: *It is true that many of CMC's purchase options do not include timber rights. CMC believes that the buffer area around the mine for which it controls the timber rights is of sufficient size to screen mining activities from the general public even if timber harvesting does occur on other areas. We will continue to work with all landowners to avoid or limit the occurrence of timber harvesting on land optioned by CMC.*

Comment 110: In other cases, such as Spirit Hill, the harvesting of timber is clearly outside of the control of the company. The temporary loss of timber due to harvesting or natural causes during the life of the facility is a likely possibility. In order to analyze this condition, we need two fairly high quality topographic maps. One should be similar to Fig 2.2 Project Area and the second large enough to contain all of the view points. Both should contain the location and elevation (MSL) of the top of the TMA berms and the Headframe along with any other structures more than 50 feet in height.

Response 110: *As described in Section 4.2.14.1.2 of the project's EIR, CMC has negotiated an agreement to protect the timber on Spirit Hill. Aesthetic impacts are discussed in Section 4.2.12 and shown on Figures 4.2.12-1, 4.2.12-2 and 4.2.12-3.*

Comment 111: The Sanborn Group numbered viewpoints should also be designated. The project area map should include the location of private dwellings and cottages and preferably a 1000 foot grid overlay. The reproduced maps provided to date are not of adequate quality for this purpose.

Response 111: *Aesthetic impacts are discussed in Section 4.2.12 of the EIR. Additional topographic mapping can be provided to the WDNR, if required, based on the Department's review of this section of the report.*

Comment 112: We also need a description of the average and maximum widths of the clearing needed to construct and/or maintain each of the ancillary facilities such as the rail spur, the waste water pipeline, the gas line, the power line and the access road. Is Fig 2.2 an accurate depiction of the timber clearing necessary for the plant site, TMA, borrow area and reclaim pond, or would additional clearing be required during construction or operation? Since construction of some of the ancillary facilities will be wide open to public view, a discussion of the construction aesthetics and mitigation/landscaping of these facilities should be included. Will there be any structures such as pumping stations, transformers, meters, etc [sic] outside of the plant site along the ancillary facilities? If so, describe these and their location.

Response 112: *Aesthetic impacts are discussed in Section 4.2.12 of the EIR. Additional topographic mapping can be provided to the WDNR, if required, based on the Department's review of this section of the report.*

Comment 113: The length and location of the rail spur second track will affect aesthetics since this is the area where cars will routinely be parked. Please provide a topographic map showing that portion of the spur north of Swamp Creek including the location of the tracks, adjacent farm fields, wooded areas, roads and residential units along with the viewpoint locations used by the Sanborn Group.

Response 113: *Aesthetic impacts are discussed in Section 4.2.12 of the EIR. Additional topographic mapping can be provided to the WDNR, if required, based on the Department's review of this section of the report.*

Comment 114: Will a water tower be required? If so describe it's [sic] location, configuration and elevation. Will any structures have aircraft warning stripes or lights? If so, please describe these. Will the exterior of the taller structures be illuminated? Describe yard lighting and any steps to be taken to minimize light pollution from parking lot and other yard lights?

Response 114: *As described in Section 4.8.11.9 of the project's MPA, a water tower will not be constructed. However, a water tank with an approximate elevation of 50 to 55 feet above MSL will be constructed adjacent to the pump house. Red warning lights will be placed on top of the head frame for aircraft safety. The other aspects of the comment are addressed in Section 4.2.12 of the EIR.*

Comment 115: The aesthetic section should discuss or reference other perceptible aspects of the operation that will impact the human senses such as noise, odor, movement (trains, traffic, congestion) dust, smoke, etc., during construction and operation. The discussion should also include

at least a brief description of what an on-site visitor would experience since this will have a larger impact on public perception of the project than a view of the headframe from 10 miles away.

Response 115: *Comment noted. An addition to this section of the EIR will be addressed in an update.*

4.2.13 Socioeconomic Impacts (Questions 116 through 124)

Based on a recent conversation with the WDNR, CMC understands that additional comments from the Department regarding socioeconomic impacts will be forwarded to CMC shortly. CMC will therefore defer responding to comments 116 through 124 until the additional comments are received.

Other/general Comments

Comment 125: In regard to alternatives for the proposal, please examine all the information pertaining to alternatives from DNR's final Environmental Impact Statement of November, 1986 on the access road, railroad spur and siding, high voltage power line and natural gas line corridors, etc., and provide us with any revisions to the information, maps and data. In addition, alternatives to the final use of the facility should be considered.

Response 125: *Alternatives are discussed in Section 4.3 of the EIR. CMC believes that discussion addresses comment 125.*

Preliminary Comments on the Tailings Management Area Feasibility Report/Plan of Operation

Comment 126: Figure 2-6, the ore body is shown as extending westwardly nearly to the west exhaust shaft, which would be located in section 30 of Lincoln Township. However, in figure 2-2, the ore body is shown as extending more than 2,000 feet into section 25 west of the west exhaust shaft in Nashville Township. Which is correct? Is the entire ore body planned for mining? Would ore be removed from lands beneath both townships?

Response 126: *Figure 2-2 is correct. Figure 2-6 will be revised and included in an update to the TMA report. Mining is planned along the entire length of the orebody. As such, ore will be removed from both townships.*

Comment 127: Waste Quantities, p.34: The discussion of waste quantities is based on the present estimate of 55 million tons or [sic] ore reserves. The previous proposal by Exxon was based on ore reserves of more than 67 million tons. Please explain why there is such a significant difference in these estimates and what is the likelihood that the actual amount of ore reserves will be greater than 55 million tons.

Response 127: *The cutoff grade for minable reserves was lower for the prior project. The lower the cutoff grade for mining, the higher the ore reserves. Conversely, the higher the cutoff grade, the lower the ore reserves. As currently proposed, the facility will be designed to extract an approximate 2,000,000 tons of ore per year over a 28-year life. During the initial two years of operation there will be a buildup in production rates. In addition, CMC has committed to a nominal design production rate of 5,500 tons per day. All project facilities have been sized based on these design values. Once mining begins and additional exploration and grade control drilling as described in the project's MPA is completed, changes*

in the projected ore reserves could be made. These changes could result in either an increase or decrease in the reserve. It is very unlikely that changes in the ore reserves would be substantial due to the amount of delineation work done to date.

General Comment: Clay Sources, p.87-91: The proposal is to use native clay for tailings cell 1. We will prepare a section in the DEIS describing how clay is removed from its source, processed and transported to the project site along with an evaluation of the major impacts of clay removal. In order to do this, we will need the following information:

Comment 128: In order to put into perspective this magnitude of clay removal, additional information about the clay suppliers is necessary. For example, are they active commercial ventures now, and if so, how does the amount of clay needed for the Crandon project (cell 1) compare with the annual number of cubic yards of clay processed?

Response 128: *Item to be discussed with WDNR before a final response is provided.*

Comment 129: A description of the clay deposits in terms of thickness, overburden thickness, vegetation overlying the deposits, proximity of lakes and streams, reclamation activities (if any) following removal, processing the clay, on-site storage and other important considerations involving commercial clay extraction. (Eventually, we would like to view a commercial clay removal operation to better understand how such an operation proceeds).

Response 129: *Item to be discussed with WDNR before a final response is provided.*

Comment 130: The clay volumes proposed are for the liner and reclamation cap for TMA cell one. We will have to evaluate the impacts of using clay or similar materials for the other three cells as well. Please provide alternative sources, costs and other pertinent information so we can evaluate the impacts of obtaining clay for the other three cells.

Response 130: *Item to be discussed with WDNR before a final response is provided.*

Comment 131: Section 2.4.7, Utilities, paragraph 1 - Please see your copy of McKnight's letter to Mr. Greg Egtvedt of Wisconsin Public Service Corporation dated January 9, 1995, regarding the proposed High Voltage Power Line from Venus-Crandon Mine for more details. In paragraph 2, CMC should provide more details for the probable location(s) of the proposed natural gas corridor. CMC should also clarify if Sentence 2's description that the gas line "...will follow existing county roads..." (emphasis provided) really means town roads for that part of the route. This same statement is in other CMC reports, including EIR Section 2.4.7, paragraph 2.

Response 131: *Response 2 above addresses these comments.*

Comment 132: Section 2.4.11 (page 20), Paragraph 3, Last Sentence - If the buried segments of pipeline will be "left in place", why will the "pipeline routes be graded and revegetated?" (or does this mean only at the mine site?) Also see EIR page 2-12, paragraph 4 for this same statement.

Response 132: *Response 3 above addresses these comments.*

Comment 133: In Section 2.4.11, page 20, paragraph 4, more details are needed on what specific "construction materials will be removed" including bridges, culverts, fills in wetlands, etc. (see my previous remarks for EIR Section 2.4.11, paragraph 4).

Response 133: *Response 4 above addresses these comments.*

Preliminary Comments on the Mine Permit Application

Comment 134: Table 2-5 (page 31) - CMC should clarify how the estimated amounts of wetland disturbance for the "Current Project" access road has changed (from previous calculations) to 3.91 acres, and the railroad spur to 3.05 acres.

Response 134: *The change in wetland acreage for the railroad spur resulted from a slight change in the alignment of the railroad spur for the current project. The change for the access road resulted from a recalculation of the acreage for the access road alignment.*

Comment 135: Section 4.10.6.6 (page 126) - The erosion control devices described are good, but much more is needed. For example, please see your copy of the recommendations in McKnight's memo of 6/13/95 to Jim Bertolancini regarding the NR 216 Erosion Control Plan for the wastewater pipeline corridor.

Response 135: *Item to be discussed with WDNR before a final response is provided.*

Comment 136: Section 5.9.1.3, Paragraph 1 (page 159) and Section 5.10.1.2, Paragraph 1 (page 160) Sentence 3: the values and disadvantages of the proposed filling and regrading the road ditches should be evaluated further. There are erosion potential disadvantages with disturbing the previously stabilized soil to re-contour some of these areas, especially near sensitive areas.

Response 136: *CMC's reclamation plan is based on the intent to shape and contour landforms following facilities removal. To accomplish this, there will be a need for a certain amount of regrading. If the Department desires that the regrading not be performed, CMC is willing to discuss the topic.*

Comment 137: Table 5-10 - If the access road is to be maintained for 75 years (as described in 5.9.1.2), why will "random groups of mixed conifers and hardwoods" be planted during the "construction phase" (years "1-3")? Might these trees contribute to road ice problems by shading the road in winter months, and create potential collision/obstruction safety problems in the clear zones, necessitating tree cutting and removal long before year 75? Also, would the powerline area along the road right-of-way be planted with these trees?

Response 137: *Tree planting along the access road will be initiated during the construction phase to allow progression of reforestation to begin as soon as possible. The initial planting of mixed conifers and hardwoods would not occur along southern sides of the access road right-of-way, along portions of the access road with limited sight distances, or beneath power lines. Initial planting will occur in areas disturbed during construction which are capable of being immediately restored on a permanent basis.*

The following comments pertain to solid waste considerations:

Comment 138: Is the company comfortable with solid waste estimates from 1984?

Response 138: *Yes. The 1984 estimates are likely somewhat overstated, but overall provide a reasonable estimate of the types and amounts of material to be generated.*

Comment 139: While the report mentions the solid waste bans related to recycling, they do not state how CMC would manage each of the seven items. They provide only broad brush comments. This is especially true with the cardboard. Please provide more detail.

Response 139: *Comment noted. An addition to this section of the MPA will be addressed in an update.*

Comment 140: It appears CMC will stockpile the recyclable outside in a lined pit. This will not be acceptable for papers and cardboard. We feel frequent pick-up of all recyclable is needed.

Response 140: *Comment noted. A clarification of this section of the MPA will be addressed in an update.*

Comment 141: The recoverable percentages for recyclable appears to be low, and is based on 1990 data, which also are low. Please revise.

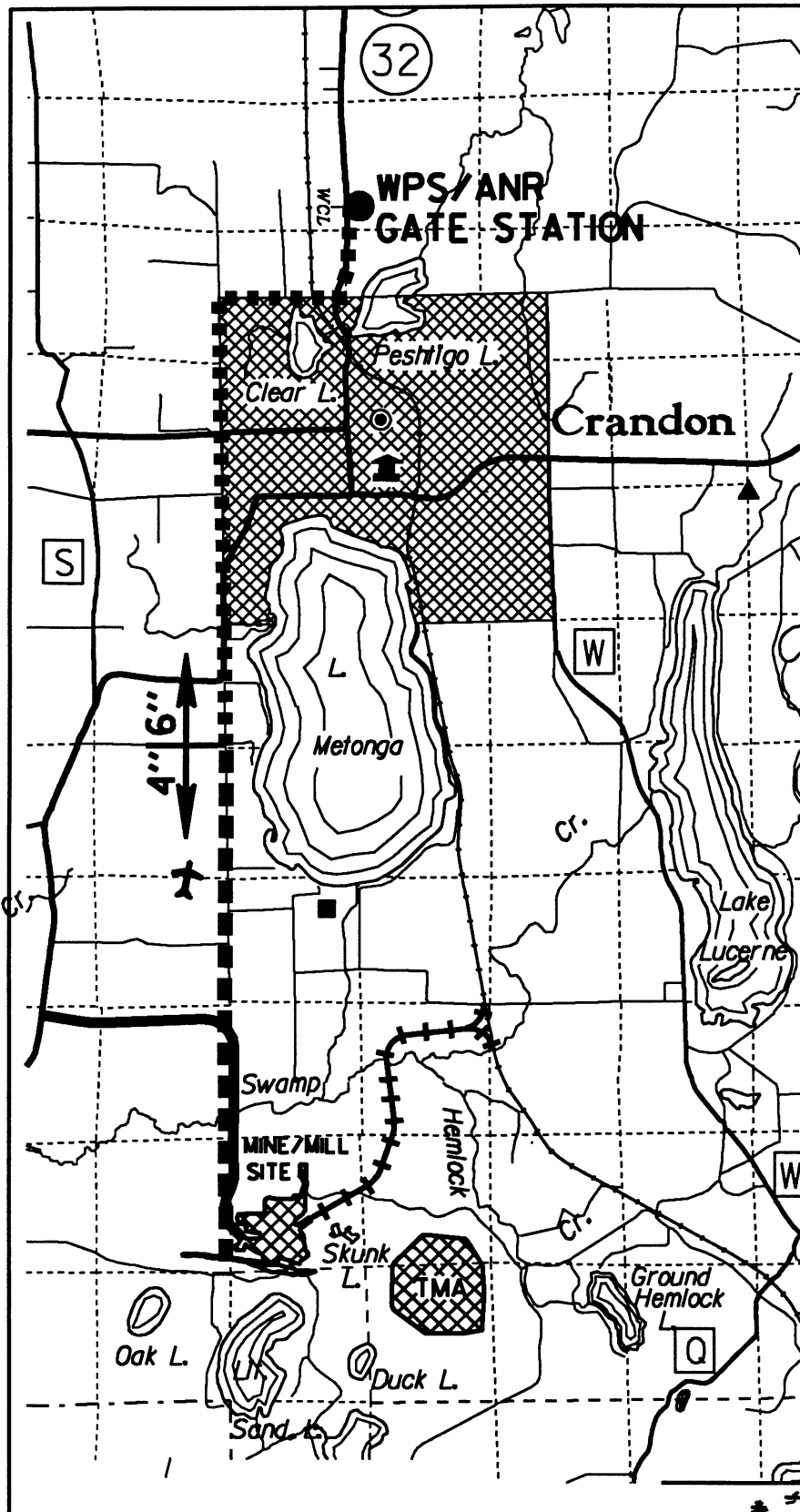
Response 141: *Comment noted. A revision to this section of the MPA will be addressed in an update.*

Comment 142: We find no reference to handling waste oil or other similar fluids in the waste management section. This needs to be addressed because poor handling of these materials may cause environmental problems.

Response 142: *Comment noted. An addition to this section of the MPA will be addressed in an update.*

Comment 143: Have local recycling ordinances been addressed?

Response 143: *The Crandon Project plant site is located in the Town of Lincoln, Forest County, Wisconsin. As we understand, the Town of Lincoln has designated Forest County as the "responsible unit" in accordance with Chapter 13 of the Forest County Responsible Unit Recycling Ordinance. Per this ordinance, CMC must separate recyclable materials defined in 13.04(26)(a) through (o) from garbage and refuse. CMC is considering two alternatives for meeting these requirements. Under the first alternative, CMC would implement an on-site recycling program which would include collection bins located at various site structures with consolidation of recycled materials at a central collection point. This alternative, which is presented in the project's MPA, includes pick-up of collected recyclables by a contracted recyclable material hauler. The second alternative is to contract with a solid waste hauler who would send waste to a processing/disposal facility licensed by the WDNR where the recyclable materials from the solid waste stream would be recovered. These and other alternatives will be evaluated during final design for compliance with state and local recycling laws and ordinances.*



NOTES:

1. BASE MAP DERIVED FROM COUNTY MAPS PREPARED BY THE WISCONSIN DEPARTMENT OF TRANSPORTATION.
2. ORE BODY OUTLINE IS REPRESENTATIVE OF THE SUBCROP AT THE BASE OF THE OVERBURDEN.
3. PROPOSED GAS PIPELINE ROUTE INFORMATION PROVIDED BY WISCONSIN PUBLIC SERVICE CORPORATION.
4. ACTUAL GAS PIPELINE ROUTE TO BE DETERMINED IN THE FIELD.

Foth & Van Dyke			
REVISED	DATE	BY	DESCRIPTION
CHECKED BY:		JKS	DATE: NOV. '95
APPROVED BY:		GWS	DATE: NOV. '95
APPROVED BY:			DATE:



Crandon Mining Company

FIGURE
PROPOSED GAS PIPELINE ROUTE

Scale: 1" = 7000' Date: NOVEMBER, 1995
Prepared By: Foth & Van Dyke By: JRB2