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Summary of public comments and questions from the May 14, 1997 public meeting at Crandon, Wisconsin, with DNR responses.

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Public Concerns Regarding the Proposed Crandon Mine & DNR Responses

A Summary of Public Comments and Questions
from the May 14, 1997
Public Meeting at Crandon, Wisconsin,
with DNR Responses

Wisconsin Department of Natural Resources
Bureau of Integrated Science Services
P.O. Box 7921
Madison, WI 53707

June 27, 1997

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LIST OF ACRONYMS AND ABBREVIATIONS

CMC:	Crandon Mining Company
DEIS:	Draft Environmental Impact Statement
DNR, or "Department":	Department of Natural Resources
EIS:	Environmental Impact Statement
GCL:	Geosynthetic Clay Liner
PM ₁₀ :	Particles less than 10 microns in diameter
TMA:	Tailings Management Area
TSP:	Total Suspended Particulates, a measure of air quality
U.S.EPA	United States Environmental Protection Agency

Introduction

The Department of Natural Resources (DNR) wishes to thank all of the citizens who attended the May 14 public meeting at the Crandon Community Center. As was intended, the Department received many comments and questions during the meeting. Many of these questions raised issues that the DNR intends to analyze before publication of the Draft Environmental Impact Statement (DEIS).

Additional information is available in a number of recently updated mining information sheets available from the Department's Rhinelander (call Cathy Cleland at 715-365-8997) or Madison (call Shannon Fenner at 608-267-2770) offices. These are: *Potential Mining Development in Northern Wisconsin*, *The Cumulative Impacts of Mining Development in Northern Wisconsin*, *How a Mine is Permitted*, *Local Decisions in Mining Projects*, *Protecting Groundwater at Mining Sites*, *Reclamation and Long-term Care Requirements for Mine Sites in Wisconsin*, *How the Department of Natural Resources Regulates Mining*, *Addressing Public Concerns with Wisconsin's Laws Governing Mining*, and *Wisconsin's Net Proceeds Tax on Mining and Distribution of Funds to Municipalities*.

For a comprehensive description of how mining is regulated, refer to: *An Overview of Metallic Mineral Regulation in Wisconsin*, by Thomas J. Evans, published by the Wisconsin Geological and Natural History Survey (WGNHS) as Special Report 13, 1996 (revised edition). The document is available from the WGNHS office in Madison (phone: 608-263-7389).

The following pages contain DNR responses to the questions and comments that arose at the public meeting. By reviewing the videotape of the meeting, the Department has made an effort to include each comment. Unfortunately, not all verbal questions from the audience were audible on the tape.

In the instances that several individuals asked similar questions, an attempt was made to accurately capture the essential meaning in a single paraphrased question. Of course, with the number of comments received, it is possible that one or more questions have been accidentally overlooked. This is not the Department's intent, and any questions not answered within this document should be sent to Bill Tans at the following address: Bill Tans (SS/6), Department of Natural Resources, P.O. Box 7921, Madison, WI 53707. The questions and comments are written in bold type, and the Department responses follow each question in regular type. Where Wisconsin Statutes or Administrative Codes are paraphrased, the reader is advised to check the original language if more complete information is desired.

The Ore Body

1.

Q: How big a sample of the ore body do you have at the DNR to sample and analyze?

A: There are no ore body samples at the DNR. However, CMC (Crandon Mining Company) has allowed the Department to access its drilling projects and core storage shed. In this way, we have been able to check and verify the company's analyses of the ore body. For this mining proposal, the company produced more than 600 pounds of tailings to be used for lab work, testing, and waste characterization studies. The Department has done a considerable amount of verification work in this regard.

2.

Q: What percentage of the ore body is mercury?

A: The 1994 master zinc ore composite sample tested at seven mg/kg mercury or 0.00073%. Composite samples of tailings and waste rock showed lesser values. Apparently some of the mercury in the ore would end up in the concentrate, which would be shipped out - thus accounting for the lower values in the tailings.

Monitoring

3.

Q: Will there be wells around the perimeter of the TMA and the property to monitor groundwater conditions? Will there also be monitoring wells farther out?

A: The answer to both questions is yes. Part of the mine permit application is a proposed environmental monitoring plan including a proposal for long term groundwater monitoring. The Department's review of this plan cannot be completed until we have completed our analysis of the groundwater modeling.

The monitoring of groundwater quality and quantity is typically accomplished by placing the majority of the monitoring wells in the areas of maximum potential impact, with progressively fewer wells out to and beyond the points of expected impact. This would enable detection of early warning signs of any developing problems. In addition, some wells must be located beyond any potential mine-induced impacts in water table elevations or water chemistry in order to monitor variations in natural background conditions.

Monitoring wells are usually grouped in "nests" of three or more, drilled to various depths to allow for the sampling of the aquifer from the top to the bottom. Soil and rock samples are collected during the monitoring well construction in order to document the water transmitting characteristics of each soil or rock layer. With this information, and by measuring the water level difference between the shallow and deep wells in these nests, the direction and speed of any vertical flow can be estimated. In addition, by measuring the water levels in wells in several locations, changes in water table elevations can be mapped. The wells also provide a means of determining any change in water chemistry. The state standards for monitoring well construction and materials (Ch. NR 141) are designed to protect the integrity of the water chemistry samples and provide for accurate water level data.

4.

Q: What will this project cost the DNR each year to monitor?

A: Department oversight of a mining project is conducted by a number of different programs and at varying degrees of intensity. Workload for some programs would be relatively minimal and easily absorbed into existing budgets and work plans, while other programs could be significantly affected and may require additional staff in order to accommodate the workload associated with the project. Assigning a cost to the Department's oversight activities is very difficult, but based on experience with the Flambeau Mine, the equivalent of 3-4 full time staff (roughly \$150,000-200,000/year) would be required to conduct surveillance at a project such as the Crandon project. This level of staffing would be needed in the early stages of the project and would decrease after the construction and initial operating phase. If this additional staff were needed, it would be reimbursed by the Mining Fund, which receives payments from the mining company. However, regular permit related activities for the Crandon mine by existing DNR staff would be reimbursed by the General Fund, as are all other permit related activities in the state.

Water quality

5.

Q: When people can't get good drinking water, they sometimes go into the bedrock - down to 500 feet. Sometimes they encounter clean water at this depth, meaning the bedrock must be fractured. There must be bedrock fractures in the area. How can you know which way the fractures go in the bedrock around the ore body and mine site? How can we know how this impacts water flow and quality?

A: We know that the bedrock beneath the site is fractured. The mining company has done a detailed fracture analysis of the several hundred thousand feet of core collected during exploration drilling and identified five significant fracture orientations. The majority of the bedrock fractures were caused by regional stress fields applied to the bedrock at known periods during geologic time and, therefore, are reasonably predictable in orientation and spacing. This information and a detailed stress analysis is necessary for safe design and operation of the mine. The data has been provided to us to assist in our analysis.

We recognize that, even with the measure of predictability provided by the fracture sets identified in the company's work, we cannot know precisely where every fracture is located. We can, however, use that information and what we know about the overlying geology and the physics of groundwater movement to make reasonable predictions of impacts due to the groundwater withdrawal.

6.

Q: Is the water quality standard the same at 2000 feet below the surface, 10 feet below the surface, and for surface water?

A: Groundwater standards do not vary with depth of the groundwater, but groundwater *quality* does. All groundwater *used for human consumption* must meet the standards, whether it comes from 20 feet below the ground or 200 feet below the ground. Much of the groundwater below the 500 foot depth in northern Wisconsin is very briny due to

natural geologic conditions and does not meet standards for drinking water.

Groundwater (water stored or moving slowly beneath the earth's surface) and surface water (lakes, springs and streams) quality standards differ somewhat from one another. Groundwater standards have been developed in order to provide safe drinking water for humans. Surface water standards have been developed to protect those species that are most intolerant of pollutants (see Response #7), and must consider also the impact of accumulating contaminants as they move up the "food chain." Because of these differing considerations, the numerical pollution standards or limits vary for most substances when comparing groundwater and surface water standards.

7.

Q: How are the surface water quality standards determined? Is this different than how the groundwater quality standards are determined? Why the difference?

A: There is some difference in how these standards are developed, because the uses of groundwater differ in some ways from the uses of surface water. Surface water quality standards have been established in order to protect against both short-term ("acute") and long-term ("chronic") impacts on aquatic species (primarily fish and the organisms on which they feed) that are most intolerant of pollutants. The reasoning behind this is that if the organisms that are most intolerant of pollutants are protected, the ones which are more tolerant will also be protected. The standards also protect against long-term impacts to wildlife and human health. These criteria are intended to prevent even borderline or minimal impacts, by establishing what are referred to as "threshold levels" of harmful substances. All of the criteria relating to long-term impacts have been established to represent safe levels of potentially harmful substances. The numerical standards for surface water pollutants are derived from laboratory tests and other studies that measure the effects of pollutants on a wide variety of species. Surface water quality standards are contained in Ch. NR 105, Wis. Admin. Code.

By contrast, groundwater standards have been developed in order to provide safe drinking water for humans. They also provide protection to domestic animals and to crops irrigated with well water. Groundwater standards must also ensure that the discharge of groundwater into surface water does not create a surface water violation.

Through the statewide well monitoring program, Department staff identify potentially harmful groundwater substances. The results of this ongoing survey are used to develop a "Priority List of Substances" that have been found, but for which there is no existing health standard. The priority list is then shared with a state Department of Health and Family Services toxicologist. The toxicologist either assigns a groundwater standard from a list prepared by the U.S. EPA (if that substance is on the EPA list), or computes a standard by applying a formula contained in Chapter NR 140, Wis. Adm. Code. The EPA standards and the formula are based upon studies of the harmful effects of the substances being evaluated.

8.

Q: Is water runoff on the surface being considered in your review?

A: Yes. Stormwater runoff impacts are an important consideration in reviewing the CMC plan, as they are with any industrial plan. CMC is developing a stormwater management plan, and Department staff will review it to see whether it would adequately protect area streams and lakes from stormwater runoff.

9.

Q: Why doesn't CMC take well water samples in the 12 mile radius of the project so if our wells dry up or change we'll be able to prove what the conditions were before the project? How could CMC replace well water quality by drilling deeper if the water quality at lower depths is poor?

A: As a requirement of the High Capacity Well Permit, CMC must inventory the water supplies and analyze the water quality of each water supply well within a specified distance from the project site. The inventory will identify the ownership and construction details for each drinking water supply. The water quality analysis of each water supply will include a wide variety of properties such as toxicity, hardness, and iron.

The area where CMC will be required to determine the status of the water supplies will be based upon the results of the Department's groundwater modeling review. The specified distance will account for a worst-case scenario by extending beyond the area the model predicts as the maximum extent of impact. Although the modeling is not yet completed, and a well sample area has not been specified, the area will *not* extend to a twelve-mile radius around the project. It is more likely to extend no more than four miles from the project in any direction.

The water supply status assessment will allow CMC and the Department to evaluate the existing condition of each water supply and to determine if a change in the quantity or quality of the water supply might be due to the mine activities. Chapter 293, (formerly Chapter 144) of the Wisconsin Statutes requires under section 293.65(3)(b), that, "No withdrawal of groundwater or de-watering of mines may be made to the unreasonable detriment of public or private water supplies." CMC will be required under the conditions of the High Capacity Well Permit to correct any impact the groundwater withdrawal may have on the water quantity and/or the water quality of the water supplies in the area. If the water quality of a replacement water well, or a deeper well, is poor (high iron content, for example), CMC would also be required to treat the water to acceptable standards.

Groundwater Drawdown and Mitigation

10.

Q: The Wolf River has different flows in different places. What effect would the groundwater drawdown have on the Wolf River?

A: Laws safeguarding public rights in Wisconsin waters prohibit the Department from allowing significant water loss to the Wolf River to occur. The Department must instead determine how much water loss would be considered legally and environmentally significant.

Department staff are in the process of defining the range of public rights in all waters that could potentially be affected by groundwater drawdown. These rights include navigation, enjoyment of natural scenic beauty, healthful water quality, swimming, fishing, and others. As part of this process, the Department will determine a surface water elevation (for lakes) or a stream flow (for streams) necessary to protect the public rights (called a "public rights stage"). This water level or flow will likely vary with natural seasonal fluctuations necessary to maintain shoreline plant communities, spawning habitat, etc. (as opposed to being one constant year-round elevation or flow). Once the Department completes its determination of how groundwater and stream flows could be affected by the mine, it will compare the projected

impact to each of the potentially affected lakes and streams with the identified public rights stages.

The Department would require the operator of any mine to mitigate surface water losses due to mine pumping by replacing lost water with an amount sufficient to maintain the public rights stage. (See Response #12 for discussion of the potential replacement water sources.) Frequent monitoring of water levels and flows would be required so that the need for mitigation water can be predicted in advance. The public rights stages, mitigation water sources, and other details would all be contained in a surface water mitigation plan that the mining company would have to prepare, with Department oversight and approval.

If the mine de-watering would reduce the stream flow anywhere in the Wolf River basin below the public rights stage, then the mining company would be required to add enough clean water (probably to affected tributaries) to make up the difference.

11.

Q: How can they draw down Ground Hemlock Lake? We wouldn't be allowed to. What if it is drawn down? Where would they get replacement water? Would it be clean?

A: The preliminary results of the groundwater modeling indicate that Ground Hemlock Lake would be unaffected by the mine-related drawdown. This will be further discussed in the DEIS. Laws safeguarding public rights in state waters prohibit the Department from allowing such a drawdown to occur. See Response #10 for a discussion of these public rights.

See Response #12 for a discussion of the potential sources of mitigation water. Any water used for mitigation would need to be "clean" in that it would need to mimic the conditions already present in the lake.

12.

Q: Using wells to provide water for mitigation will create its own drawdown problems to deal with.

A: We agree that specially pumping mitigation water from wells would increase the drawdown. For this reason, the Department has informed CMC that other sources of mitigation water would be preferable. There are three main potential sources of mitigation water: intercepted (uncontaminated) mine water, treated mine wastewater, and pumped groundwater. Use of the first two water sources would reduce the water to be pumped through the pipeline to the Wisconsin River and it would limit the additional impacts from pumping wells for mitigation water. The Department's complete analysis of the mitigation plan will be included in the DEIS.

Risk Assessment

13.

Q: Are the frequent rail car derailments that happen in this area considered in your assessment? Do you have records on the conditions of the tracks?

A: Our Environmental Impact Statement (EIS) will evaluate the impacts of increased rail and roadway transportation of chemicals and materials to the project site as well

as outbound rail transportation of concentrates. The condition of the tracks is one of several factors that will be included in this risk analysis.

The Roles of the DNR and the public

14.

Q: Now that the DNR is an arm of the Governor, your decision is pre-ordained. Your credibility has been weakened.

A: The decision on the mining project is far from pre-ordained. Although the DNR Secretary is now appointed by the Governor, there are many important factors that will ensure that the review will continue to proceed in an absolutely fair and unbiased manner.

As in all projects, the Secretary has directed that this project be reviewed in a thorough and impartial manner, with no bias for or against the project. The DNR has hired knowledgeable, independent consultants to review the information provided by CMC and its consultants. These consultants have also requested updates, revisions, and improvements in the methods or procedures CMC has used in obtaining technical information about the mine site and in determining the effect of the proposed mine on the regional environment. If the company cannot comply with all relevant state, federal, and local laws, the mine cannot be permitted.

State mining law requires that the DNR hold a Master Hearing after release of the EIS. This trial-like hearing enables all interested persons, groups, agencies, tribes and municipalities to question any aspect of mine development, waste storage, permit review, data acquisition, data analysis, and any other related topic and enter information or testimony into the record. The final written decisions on the permits are based on the entire record, not just on the DNR's position. Department staff who worked on this project will be made available at the Master Hearing. The decisions reached as a result of the Master Hearing can be appealed either administratively (to the DNR Secretary) or judicially (to a court of law).

The Department is fully aware of public concerns regarding political influence in this process. We want everyone in this State to understand that our review has been, and through the end of this process will always be, based solely on the best scientific review possible. There will be no other influences allowed to affect the permit review and development of the EIS.

15.

Q: Are you considering local opinion in this project review? We at Ground Hemlock Lake don't want this toxic dump in our backyard!

A: The DNR has been given the authority by the Legislature to review mining proposals in the state. Any interested private citizen should participate in these types of issues by electing like-minded representatives to establish and revise the laws that regulate mining, as well as participating in the public hearing process prescribed by law. Participation in meetings and hearings, both at the local level and at the state level, helps to ensure that all relevant public concerns are addressed during the decision-making process.

Through public meetings and the environmental impact process we seek and use public comments on the project. However, if the proposed mine is found to meet all environmental protection standards, comply with all applicable laws, receive local zoning

approval and minimize impacts to wetlands, the Department must issue a mining permit. The statutes do not allow the Department the option to deny a mining permit under such circumstances. If it is determined that the mine cannot comply with all our laws and regulations, the Department must deny the permit. Public acceptance of a proposed mine cannot be considered by the Department in reviewing a mining proposal. There is no "popular vote" built into the environmental review of projects, including mining projects.

16.

Q: Why should we have to deal with these impacts? We were here before the mining company.

A: The various laws passed by the legislature that regulate mining acknowledge that a mining company has no choice over the location of an ore body. These laws do not require that there be no impacts at all from mining, but they do afford the same or greater degree of environmental protection that we require of nearly all other industries.

17.

Q: Having the company perform the monitoring is like the fox guarding the henhouse.

A: Due to the enormous amount of industrial and municipal monitoring that must go on throughout the state, it is impossible for the DNR to perform all the monitoring itself. The current practice in the state (as well as across the country) is for industries and municipalities to perform their own monitoring, using methods and laboratories which have been approved by the DNR. This method is supplemented by periodic split samples (in which a sample is split and the DNR takes one part to verify the results that the industry or municipality submits), scheduled and unscheduled site visits, and frequent laboratory relicensing.

In the Department's experience, it is extremely rare for a company to submit falsified information. A company has little incentive to falsify information; doing so would subject it to fines and would be grounds for revocation of the relevant permit(s).

Making the Decision

18.

Q: How is the decision-maker determined? Will the Hearing Examiner be one person or a group of people?

A: The Hearing Examiner will be one individual, appointed by the Department of Administration Division of Hearings & Appeals. Under state law, the Secretary of the DNR determines how the decision is made. He or she can choose from three alternatives for making the final decision. Either the decision is made by the Department, the decision is made by the Hearing Examiner, or a recommendation is made by the Hearing Examiner and approved or modified by the Department. After our EIS is released, the Secretary will indicate how the decision will be made. As an example, the decision-maker for the Flambeau mine was the Hearing Examiner.

19.

Q: Can other people legally challenge the final decision? How long would they have to do that? Might that delay the project?

A: Anyone with "legal standing" may appeal the permit decision. Whether an individual will be able to challenge the decision in court would be decided by the presiding Circuit Court judge, based on factors associated with the level of potential injury to the party seeking to appeal. Judging from similar situations, only those citizens, organizations and other entities that participated in the Master Hearing would be eligible to appeal the decision. An appeal must be made within 30 days of the permit decision.

An appeal would not necessarily delay a project. For a delay to occur, the presiding court would have to grant a request to "stay" (temporarily halt) initiation of work on the mine. If such a stay is granted, mine development would likely be delayed by at least several months, and possibly much longer.

20.

Q: If permits are issued, is there a guarantee they would start right away? How long would they have before their permits would expire?

A: There is no guarantee that construction would begin shortly after permit issuance. In fact it is quite likely that there would be at least a several month delay, as the permittee solicits construction contracts and develops some of the final engineering details of the project. If the permits are issued, some of them will specify that construction must begin within a defined time frame, such as five years, after which the permit is suspended and permit application documents and plans must be updated before construction could begin. Other permits, such as the wastewater discharge permit and the air quality permit, are only valid for a period of five years and would need to be renewed after expiration of that time.

21.

Q: What if new environmental laws are passed after the project is permitted - would CMC have to comply with those laws?

A: Laws sometimes contain provisions that clarify which projects are affected by the law, but in other cases, new laws apply to all projects already permitted - so it depends on the wording. Some permits that would apply to mining projects, such as the air quality permit and the wastewater discharge permit, are issued for a specific duration (for example, five years), and must be periodically renewed. If there were a reason to change the conditions of these permits, and tighten some restrictions or add new restrictions, the Department could do it then. However, at any time after permits had been issued, if the Department had information that significant, unexpected impacts were occurring to aquatic life, to groundwater resources, or to air quality, for example, it could initiate changes to permit conditions or alter the company's actions to minimize or eliminate the environmental problem.

Liability

22.

Q: If CMC weren't around, who would be responsible for environmental damages during the 40 year long-term care period? After that period? How long would it take to go through the legal process to find the responsible parties? Wouldn't this compromise any necessary environmental remediation? What is the situation if the proposed rules don't pass?

A: Mining operations are treated in the same manner as other industries in terms of liability for environmental damage as a result of the activity. That is, the operator and its parent companies and subsidiaries would be liable for such damage. In this case, if Crandon Mining Co. were to dissolve, be sold or merged with another company, the parent companies or any successor company would assume the liability. This is true regardless of whether or not the initial forty-year long-term care period has expired. Identification of responsible parties and subsequent litigation, if necessary, can take a long period of time. However, if the site were to pose an imminent risk to public health or safety or the environment, the Department is authorized to take emergency actions to reduce such risk and recover appropriate costs from the responsible parties afterward. These laws and regulations are already in effect, regardless of the fate of the proposed rules. The proposed changes to NR 132 - establishing a dedicated trust fund to pay for unexpected environmental problems at the mining site - would not affect a company's liability. Rather, it would simply ensure that adequate funds from the company are put into a trust to take remedial actions should they be necessary, or if there were a delay in retrieving damages from the parent or successor companies.

23.

Q: If just the Department has access to the fund which would be provided by the mining company under the new proposed rules, how would individuals be able to obtain money to rectify any problems?

A: The intent of the proposed rule to create a trust fund is to provide a back-up source of funds to pay for preventative actions or for remedial measures associated with environmental contamination. Because of the rigorous permitting process, the Department expects that any mine which receives approval would not require environmental attention, other than periodic maintenance. If an environmental problem were to arise, the Department would first rely on existing liability laws which place the primary responsibility on the mine operator before it would use the monies in the trust account. Those same laws on liability would be relied upon by private parties who believe the mine has harmed them.

Private parties would not have access to the trust fund. However, if the claims of those private parties are associated with environmental damage, the Department could use the trust fund to address the remediation of that damage. In addition, should damage to an individual's water well occur from mining, the state would require the mining company to remedy the problem. There also is a mining damage fund described in sections 107.30-107.35, Wisconsin Statutes, that provides for individuals to file claims against mining companies for injury to a person or property. The Mining Impact Fund also has discretionary funds to compensate individuals for mining-related damages.

Interbasin Transfer of Water

24.

Q: Why should they be allowed to take our water? Is the Wisconsin River more expendable? If water quality treatment technologies exist to treat the water to an acceptable standard for the Wolf River watershed, why can't they be required to replace the water that they remove from the Great Lakes basin?

A: State law does not allow the DNR to specify where a company must discharge their wastewater. Rather, the law requires the DNR to ensure that any discharges meet the surface water quality standards for the specific body of water proposed to receive the discharge. The Wisconsin River is not at all expendable, but has different water quality standards as a "Fish and Aquatic Life Water" than the Wolf River does as an "Outstanding Resource Water." The standards for the Fish & Aquatic Life designation still provide protection for sensitive aquatic organisms as well as for human uses.

State law specifically provides for interbasin transfers of water out of the Great Lakes basin. The greater the amount to be withdrawn, the greater the permitting requirements and difficulty of receiving approval. The law does not require replacement of the water withdrawn from the Great Lakes basin because at the removal level proposed by CMC there would be no measurable impact on the Great Lakes.

25.

Q: Aren't many other mining companies drilling around here? What about the potential cumulative effects of interbasin transfers? Are you considering them? Is there a total capacity that is allowable to remove from the Great Lakes basin?

A: The Crandon Mining Company is currently the only proposed mining operation in Wisconsin that would divert water out of the Great Lakes basin. There is a potential that other mines may be developed in the area, and that they also could propose discharging wastewater out of the Great Lakes Basin. State statutes require an evaluation of all out-of-basin diversions. There isn't a total allowable capacity specified. There is, however, an allowable capacity for each individual diversion, so evaluations would be case-by-case. The water losses from each applicant could be limited individually to protect public water rights, including lake levels and stream flows. Cumulative effects of other interbasin diversions of water would be taken into consideration in our assessment of the environmental effects of any additional diversions.

26.

Q: I'm concerned about the long-term impacts of groundwater transfer out of the system during drought periods - it might just exacerbate an already bad situation.

A: Conditions such as drought and long-term cumulative effects would be taken into consideration in an approval process for both surface water and groundwater interbasin diversions. But because the average water loss, estimated by the mining company at 1,028,400 gallons per day (806,400 gallons per day due to Wisconsin River discharge, 199,000 gallons per day due to evaporation, and 23,000 gallons per day due to water being shipped with the ore concentrates) is approximately half of the 2,000,000 gallon per day threshold that requires our approval, the mine's water loss wouldn't be considered threatening

to the waters of the state, in accordance with Ch. NR 142, Wis. Adm. Code, "Wisconsin Water Management and Conservation." During drought conditions, mine drainage water would likely be less, reducing the water loss. Because the water loss would be greater than 100,000 gallons per day, there would be a reporting requirement imposed to monitor the volume of water loss to see if it approaches the 2,000,000 gallon per day level of regulation.

27.

Q: CMC owns 440 acres between Hwy. S and 32 north of Crandon. Would they be allowed to use that site to discharge effluent there to get around the problems with an interbasin transfer?

A: The tract in question actually amounts to about 1400 acres and was purchased by CMC as county forest replacement land. This land would be transferred to Forest County in exchange for the 1000 acres they intend to purchase from the county at the project site. The middle branch of the Peshtigo River runs through the tract. No testing of soils has occurred on this tract to determine if it is suitable for other uses such as the disposal of wastewater. The middle branch of the Peshtigo River is a Class III trout stream and has a water quality classification of an "Exceptional Resource Water." The transfer of treated wastewater to this location would still remove water from the Wolf River drainage basin and no environmental advantage of such a transfer is readily apparent.

The Tailings Management Area

28.

Q: Why can't the tailings be reprocessed into a salable product, eliminating the need for a TMA?

A: CMC has not proposed to reprocess the sulfide tailings, and the Department cannot by law require it. The technology of processing sulfide tailings has been available for some decades and is well-established, as are the potential technical and environmental effects of reprocessing of tailings.

Although the tailings could be processed, that would not eliminate the need for a TMA (Tailings Management Area) or similar, large scale disposal site. Processing the tailings would result in a pyrite-enriched fraction, which might have some value as a chemical feedstock, and a pyrite-depleted fraction, which would still have enough pyrite and other sulfide minerals to be a problem if not confined in a proper disposal site.

Processing of the sulfide fraction would start with burning or oxidizing the sulfide minerals to produce sulfuric acid - a process that can create substantial air pollution, consumes water, fuel, and electricity, and requires a major industrial plant - all of which would add to local impacts. The resulting cinder has little potential for use as iron ore, due to the remaining sulfur content and other substances that would be contaminants in a steel-making process. Thus, the cinder would also have to go to a disposal site. Due to the physical character of cinders and the residual sulfur content, cinders would likely be far more likely to produce acidic leachate than the tailings. Given this, processing is not necessarily environmentally preferable.

Furthermore, pyrite by itself has no value in North America. There are a few places in other countries where pyrite is used as a feedstock for production of iron ore or sulfuric acid.

However, this part of the industry is declining, due both to environmental problems and competition from other sources of these materials.

There are some relevant lessons from Wisconsin's experience with recycling. When prices of recycled material go down, less is collected and more goes back to landfills or the collection agencies are left with stockpiles of unwanted materials. Recycling has not turned out to be an assured way of getting rid of solid wastes. The same problem would affect any reprocessing of mining tailings. If the prices for products of processed tailings falls, the material still has to have a place to go.

29.

Q: Please comment on the comments of David Blowes, the DNR's consultant: Once acid mine drainage starts, it is self-perpetuating. The liner will degrade over time. It will need to be replaced every 100 years. The long-term care responsibilities will fall to the people of Wisconsin.

A: Acid drainage can be a self-perpetuating process until all the potential acid producing minerals have been removed. The key to managing the waste safely is to ensure that the waste is kept from developing acid drainage. The mining company has proposed a management system for their potentially acid-producing waste rock and tailings that is intended to keep acid drainage from developing. It involves managing the waste to limit exposure to oxygen (a key "ingredient" in the production of acid drainage) during both operation and post operation periods. In addition, they are proposing to maintain the tailings in an alkaline environment during operation and to include additional neutralizing materials in the tailings facility prior to closure.

There is no question that the liner in the tailings facility would degrade over time. There is some evidence available that indicates that the degradation period is likely to be several hundreds of years. It is important to note that once the tailings facility is closed and the original ponded water is drained, the facility cover (not the liner) would be the key to ensuring that an acid drainage problem does not develop. If there is little water in the facility, there would be little water coming out of the bottom of the facility. The cover would limit access of both water and oxygen to the tailings. Without both, acid drainage cannot develop. Since the cover is near the surface and relatively accessible, it could be repaired or replaced as necessary.

It is our understanding that Dr. Blowes' concern about long-term care resulted from the mining company's perceived lack of acknowledgment of their perpetual responsibility for the site. State law is clear that mining companies are perpetually responsible for their waste sites and that this responsibility transfers to any parent or successor companies. In order to ensure that funds are available into the indefinite future, the Department has proposed changes in the mining regulations to create a permanent trust fund to pay for cleanup of unforeseen environmental damage and to repair or replace the tailings facility cover as needed.

30.

Q: Why can't the tailings be pumped to a spot that's not as environmentally sensitive? Why did they pick this spot? Has there been any consideration by the DNR of moving the tailings ponds?

A: The TMA area is not particularly "environmentally sensitive", compared to most of the other potential disposal site locations that have enough area, access, and soil

resources to be useable. In terms of depth to groundwater, soil types, and ability to support weight, upland locations such as the TMA are clearly superior to the lowland areas. The geology and topography do not change substantially for many miles around the mine site area, so when considering a number of alternative sites, there are many good reasons to pick the one closest to the mine. The proposed TMA location appears to be as good as or better than the other candidate sites. Locating a disposal site in lowland or in one of the natural lakes would, in our opinion, really be in a more "environmentally sensitive" location.

The Department can reject a proposed site for cause but under the law the site selection process is the responsibility of the applicant. Specific site selection criteria spelled out in the law and rules must be followed by the applicant during the selection process. The following is a brief summary of some of the more important siting criteria:

- the physical characteristics, geology, and hydrogeology of the site must support a design that will not result in a violation of surface water or groundwater quality criteria;
- the site must provide for a structurally stable design;
- the site must not be within 1000 feet of a navigable lake, pond or flowage;
- the site must not be within 300 feet of a navigable river or stream;
- the site must not be within a floodplain;
- the site must not be within 1000 feet of a state trunk highway unless screened;
- the site must not be within 1200 feet of a private or public water supply well;
- the site must not be located over a known mineral resource;
- the site must be large enough so that the exterior of the facility berm will not be within 200 feet of any property line;
- site selection criteria must include the minimization of disturbance to wetlands;
- site topography must allow for provisions for the diversion and management of storm water runoff around the facility;
- if practicable, the site should be located in the same watershed as the mine surface facilities.
- tailings pipelines should be as short as practicable;
- the site must not be within areas having the presence of endangered or threatened species unless these species can be firmly re-established elsewhere;
- archeological areas must be identified and protected; and
- the parcel must allow for a facility design which will meet all other local, state and federal rules and regulations, including local zoning requirements.

In addition to the above, there are some practical siting criteria that the company must consider, including the following:

- the land must be available from a willing seller;
- suitable access routes to the site must be available;
- the parcel must be large enough to contain most if not all of the waste, plus provide for up to 1200 feet of buffer area around the facility;
- splitting the waste facility into two separate sites could be considered, but three or more locations would probably be unacceptable because of the extensive network of pipelines and haul roads that would be required; and
- if possible, the site should contain enough suitable soil so that soil from off-site

is not required for construction and reclamation.

The initial TMA siting process conducted by Exxon Coal & Minerals resulted in the selection of 35 sites, within approximately 12 miles of the mine site, which alone or in combination would be of suitable size. Approximately half of the selected sites were located in lowland wet areas and the Department advised the company that these were unsuitable due to wetland, groundwater and surface water considerations. The remaining sites were evaluated and ranked based on the above criteria, resulting in the final selection of the proposed TMA location. None of the other sites were found to have significantly superior soil, geologic, or hydrogeologic characteristics that would have resulted in additional protection of the groundwater or surface water. Documentation covering the investigation and site selection process is contained in several reports and is available for public review at the Department's regional headquarters in Rhinelander upon request.

31.

Q: Have tailings ever been stopped from oxidizing?

A: Some tailings disposal sites have been subject to intensive research. Sulfide tailings that are permanently covered by water seem to stop oxidizing in any significant way and appear to be stable. Other sites have been shown to oxidize where tailings are exposed to air. However, many of them develop a subsurface crust a few feet down that protect deeper tailings. The design of the TMA uses engineered features to replicate the conditions that control tailings oxidation at these older projects.

32.

Q: Ducks and geese will land in the TMA and spread the contaminants.

A: Birds might well loaf on the dry perimeter or the central pond of the TMA. However, the active TMA cell would not support the vegetation that waterbirds need to eat. Geese and other birds might graze on grass on the closed TMA cells, but that would not lead to spreading of contaminants.

33.

Q: What if the contractor constructing the TMA doesn't do things according to the specifications?

A: Assuming the proposed TMA is approved and constructed, the Department would be closely monitoring construction activities, through a variety of methods, to be certain that the facility would be constructed as permitted. If alternative methods are needed to construct a facility, they would have to be agreed upon by the Department in advance. Any deviation from the plan would have to be evaluated individually and judged accordingly. If the construction is not completed as planned, we would have to evaluate the significance of the different construction and how well it would function compared to the original plan. If it is our opinion that the different construction would not function as well as the proposed plan, one option would be to reconstruct the work according to the original plans.

34.

Q: The TMA will be visible to the residents of Ground Hemlock Lake - we don't want to be able to see it.

A: The aesthetic impacts of the facility, primarily the tall headframe and the TMA, will be evaluated in our EIS. By law, aesthetic impacts should be minimized to the extent possible. Regardless, the Department has very little regulatory authority to demand project changes based on considerations of appearance.

Homes built on the west side of Ground Hemlock Lake are at or below elevation 1600, are built in woodlands, and many face eastward, away from the TMA. Homes built on the east side of the lake are at about elevation 1600 feet and oriented so that the primary view is westward to the lake (and toward the proposed TMA). The four cells within the TMA would be built in eight stages. Stage one is the lower half of a cell, while stage two would complete the upper half. The first two cells would be on the west edge of the proposed TMA beyond the crest of the hill separating the facility from the lake.

Based on this information, the first two cells would not be visible from Ground Hemlock Lake. If some natural event caused the destruction of the screening trees, the upper-most parts of the second stages of the final two cells, (which would be constructed beginning approximately sixteen years into the project) could be visible from some of the homes along the east side of Ground Hemlock Lake and maybe from a few homes on the west side. During construction, when soils would be exposed, visibility would be greater than following reclamation and environmental stabilization with vegetation. Visibility from each home would depend on how many trees remained on each lot, slope, and elevation. Topography and the 50 to 60 foot trees adjacent to the proposed TMA would likely screen most of the facility.

Drought conditions

35.

Q: What would happen in case of a severe drought? Will this be in the EIS?

A: Pumping water from the mine and treating it for discharge is an expensive operation and the company is therefore motivated to reduce mine inflow to the fullest extent possible. Under drought conditions, evaporation from the various ponds at the facility would increase and therefore the discharge of treated surplus water to the Wisconsin River would decrease. The groundwater drawdown would take years to develop and about an equal amount of time to recover following mine closure. Because of the time required, shutting down of the mine during a drought would not reduce impacts. For these reasons, the Department's entire analysis of the impacts of the groundwater drawdown resulting from mine pumping will be based on *worst case conditions*, including an extended drought. This analysis will be included in the EIS.

36.

Q: Would they be required to shut down for a few days because of a drought? Would it be an environmental problem if they did?

A: This question was asked in the context of the Crandon Mining Company being required to provide mitigation waters to lakes and streams drawn down below the public rights

stage. The project would not be required to shut down during a drought because a shutdown would not affect lake or stream levels due to the several-year groundwater recovery time. Pumping of the mine would have to continue at all times during operations in order to keep the mine from flooding.

37.

Q: Why when we have a drought are we required to cut back on water usage - and CMC wouldn't be?

A: The question was asked by a resident of the City of Crandon, whose home is connected to its municipal water supply. Particularly in warm weather periods of drought, residents tend to use more water in and around their homes. Depending on the capacity of the municipal pumping and distribution systems, water use during drought periods may reach the capacity of the municipal system. Over-use could cause water pressure to drop or limit the availability of water in an emergency. As a result, municipal officials often ask residents to curtail certain water uses, such as lawn sprinkling, for example, as a safety measure. Because the proposed Crandon Mine would have its own water supply, and not be connected to the city's municipal supply, water use limitations imposed by nearby municipalities would not apply to the mining company.

38.

Q: Who would have the first rights to groundwater during a drought situation - the public, or the mining company?

A: The Department will assess the impacts of de-watering the mine under all conditions including drought conditions. The mining company will be required to provide alternate supplies of water when well problems are attributed to the operation of the mine, including during drought conditions.

Technological Improvements

39.

Q: What are the new mining-related requirements that Thompson put in the 1997 budget?

A: The draft legislation would add another item to the list of criteria that must be met before the Department could issue a mining permit. The draft wording pertains to whether proven technology exists, and if it would be used in the proposed project. The DNR would need to assess whether proven technology was being proposed, and if that technology would be able to operate without violating statutes or rules due to acid drainage at the TMA or mining site or due to the release of heavy metals. The budget bill has not passed at this writing.

40.

Q: None of this technology has ever been tested!

A: This statement is incorrect. The proposed wastewater treatment system, for instance, would consist of proven technology for the removal of metal contaminants, which are the pollutants of concern at a mine. The primary wastewater source is the mine drainage water that consists of the groundwater seepage into the mine that's contaminated by the ore and mining activities. Treatment processes for the removal of dissolved metals consist of lime precipitation, sedimentation of the metal hydroxides in a clarifier, sulfide precipitation for additional metals removal, filtration through sand filters to remove suspended solids, and pH adjustment. This same type of treatment is currently used at the Flambeau Mine near Ladysmith, which is generating effluent quality in compliance with its wastewater discharge permit.

Like many other industrial technologies in current use, the proposed TMA liner materials have been tested for durability using accepted simulation methods. The individual components have each been used successfully in other waste disposal systems, although the overall combination of components in the TMA design is one that has not been used before. The processed till layer and bentonite in the GCL (geosynthetic clay liner) are natural materials that have already survived for thousands of years and would not be expected to change significantly. The polyethylene geomembrane and polypropylene or polyester geotextiles have expected survival lives of several centuries under buried conditions.

Bentonite clay, the primary component of the proposed GCL, has a very low natural permeability and has been used for containment facilities for decades. For instance, bentonite blended with natural soils has been used in Wisconsin and other states for sewage and water retention lagoons. The use of bentonite clay in the form GCLs is a more recent development, propelled largely by manufacturing innovations and recent changes to federal law dealing with municipal solid waste landfills. Regulatory acceptance of GCLs has similarly become widespread, due to the results of research on their properties when used as liners. The predictive use of computer models in groundwater work is well professionally accepted.

41.

Q: How much has technology advanced between the time that this mine was first proposed and now?

A: The basic principals of environmental control and reclamation have been available for a long time. Until about twenty-five years ago, no one forced industries or municipalities to employ the environmental control technology that today everyone accepts as being essential. While it is true that the environmental/technological revolution has produced some significant improvements in environmental control and analytical technology, most of what CMC is proposing today could have been accomplished fifty years ago using materials and equipment that were available then. The major technological difference will be in the improved precision for the monitoring of all phases of the design, construction, operation and closure and the ability to analyze this data with the use of high-speed computers.

42.

Q: Out of all the new technologies that exist, is CMC avoiding any of them because of the costs?

A: The goal of any permit applicant is to select technologies which will safely and consistently meet the standards prescribed by law. If this goal can be accomplished by using any of a variety of technologies, it is reasonable to expect that the applicant will select the most economical one or combination.

43.

Q: What changes occurred since 1985-86 when the DNR reported that Little Sand Lake would be drawn down 6 feet, since now the company reports a 0.6 inch drop?

A: In the 1986 FEIS, the Department predicted that, without mitigation, the proposed mine pumping would result in a lowering of the average lake level in Little Sand Lake by 6.9 feet. Such an impact would have been unacceptable and mitigation would have been required if a mining permit had been issued. Additional information regarding the lake bed sediments and local hydrogeology has been gathered since 1986 and this information will be used along with more advanced modeling techniques to develop a new forecast. In the ongoing permitting process, the mining company has made a new prediction that the lake level in Little Sand Lake would drop by 0.07 feet (0.8 inches) under their Best Engineering Judgement scenario and 0.48 feet (5.8 inches) under their Practical Worst Case scenario. The Department's review of the groundwater flow modeling has not yet been completed, so the Department has not made any new forecasts regarding impacts to local lakes and streams.

44.

Q: According to the DNR, CMC's groundwater model isn't very good.

A: The Department and its consultants are currently reviewing the mining company's groundwater modeling work. We have raised some questions and concerns with portions of the regional flow model, and will continue to do so as our review progresses. We expect to request the company to make some changes to the regional flow model and to resubmit it. We do, however, recognize that a substantial amount of effort was put into the creation of the regional flow model and that it does appear to replicate the regional flow system fairly well.

Air Quality

45.

Q: What about the air quality impacts to us at Ground Hemlock Lake?

A: The Department has reviewed CMC's Air Permit Application and re-analyzed the data using a newer air contaminant transport model. The Department's preliminary analysis indicated higher concentrations of air pollutants than CMC had predicted, but no predicted violations of the ambient air quality standards. The review of the air quality issues is still on-going, and the Department is currently attempting to develop reasonable estimates of

existing air quality to use in the impact assessment process. The results of these analyses will be part of the EIS.

46.

Q: Would the air filters only be checked every three months?

A: The proposed frequency of sampling and filter analysis has not been determined, but more frequent monitoring during the construction phase (i.e., every third day instead of every sixth day) is being considered. The filters would be collected and weighed every third day (or sixth day depending upon sampling frequency) to verify compliance with the ambient air quality standards. Filters would then be analyzed individually for metals and air contaminants, during the construction phase and during any periods for which weighing indicated an exceedence of TSP (Total Suspended Particulate) or PM₁₀ (particulates less than 10 microns in size) limits.

Furthermore, CMC has proposed the operation of two air monitoring sites: one site west of the mine/mill facilities and one site east of the proposed Tailings Management Area (TMA). In the opinion of the Department these two sites do not provide sufficient coverage. As an alternative, the DNR has recommended four sites: the two proposed by CMC, plus a third TSP site near Rolling Stone Lake to provide background data, and a fourth site with TSP and PM₁₀ monitors, in the area with the highest modeled air concentrations of TSP.

47.

Q: On all mine sites there is dust - it can't be controlled. Between the sprayings you're going to get fugitive dusts.

A: The DNR is aware that fugitive dust emissions are a concern on all construction sites, asphalt plants, any unpaved roads, and mine sites. The truck traffic, length of the road, and weather conditions are considered carefully in the modeling and permitting aspects of the project. The facility is required to take the necessary precautions to eliminate or minimize the amount of fugitive dust emissions generated. The control of fugitive dust emissions has been successfully done at all of these types of facilities, including mine sites.

Wastewater Treatment

48.

Q: How much water that doesn't "pass the test" can be stored on-site?

A: The current plan from the mining company calls for capacity to store several day's worth of treated mine water on the site. Specifically, there would be two storage ponds on site, each with a capacity of one day of peak flow (1.728 million gallons). This is to account for the possibility of a wastewater pump failure or other problem, such as a failure of the treated water to meet water quality standards due to some temporary problem with the treatment system. If more storage capacity were needed, the company could pump the mine wastewater into the TMA.

