

pt 50

REPORT ON THE PROGRESS OF THE DNR REVIEW OF THE PROPOSED CRANDON MINE & OTHER MINING-RELATED ISSUES

Department of Natural Resources
Box 7921, Madison, WI 53707
December 1997

Introduction: We begin this progress report with a focus on new items of interest, discuss various areas of progress in our review, and then provide more basic information relating to the proposed project and the setting of water quality standards and effluent limits.

It has been almost four years since the company filed its first documents and we started our regulatory review of its mining proposal. Since our previous status report last spring, the Department's staff and consultants have continued to review the Environmental Impact Report, permit applications, technical support documents, and other data provided by the Crandon Mining Company. We are also preparing our draft Environmental Impact Statement on the proposed mine. As expected, progress is slow in some areas. We want to be certain to completely evaluate the technical studies provided to us and consider all of the possible environmental impacts and alternatives should the project be permitted and built. The final written decision on the mining permit will likely take two years or longer, and will be based on the record developed during the final hearing process. (We will discuss the final hearing process in detail in a future report.)

Rules Changes: In July 1996, the Department received a petition from a group of state legislators requesting that certain revisions be made to the state's mining regulations. The petition requested that rules be adopted to require mining permit holders to carry adequate insurance to fund appropriate remedial measures in the event that the mining operation caused environmental contamination and also to evaluate the manner in which groundwater quality is regulated at mining sites. There has also been significant public opinion that mining facilities are regulated differently than other industrial or solid waste facilities. The Department evaluated the two legislative recommendations, drafted rule revisions, and held five public hearings to receive public comment on the proposed revisions.

As a consequence, two rules changes have been adopted by the Natural Resources Board. Changes to Ch. NR 132 establishing a dedicated irrevocable trust fund were adopted in September. Changes to Ch. NR 182 pertaining to regulation of groundwater quality at mining sites were adopted at the December Natural Resources Board meeting.

The changes to NR 132 will require mining companies to establish a dedicated irrevocable trust fund to be used for anticipated regular preventive maintenance or remedial actions in the event of unforeseen circumstances. This fund would guarantee the availability of money for such purposes in the event that the responsible mining company becomes financially insolvent or is unwilling to take the necessary action. The trust fund amount will be set during the Master Hearing. Only the DNR will have access to the fund for the aforementioned purposes.

The NR 182 revisions impose the groundwater quality provisions of Ch. NR 140 to mining sites. Some of the more stringent requirements of existing NR 182, such as predictive groundwater modeling, required investigation of any change in water quality, and preparation of a contingency plan, have been retained. The Design Management Zone for mines and mine waste sites is set at 1200 feet, and a boundary of 150 feet called the Mandatory Intervention Boundary will also apply. If groundwater standards are violated at the 150 foot boundary, the operator must take action to ensure that the standards will be met at the Design Management Zone. The rule requires that monitoring wells be located along and within this boundary. The Department believes that this rule incorporates the strictest aspects of both NR 182 and NR 140.

Local Agreements: In order for the project to be approved, it needs permission from those local governments which have zoning or land use authority over the project. A local agreement is a process by which a mining company negotiates with a municipality in order to secure zoning approvals for the company and financial or other concessions for the locality. For this project there are a number of entities that are eligible to enter into local agreements, including the Towns of Lincoln and Nashville in Forest County, the City of Crandon, and Forest and possibly Oneida Counties. At this writing, all of the entities except Oneida County have signed local agreements. All of the agreements secure local permit approval for the company. Many include monetary payments from the mining company to the community. Other concessions from CMC include a guarantee of property values for residents around Ground Hemlock Lake and an agreement to take on local governments' responsibility to provide interim drinking water in case of well drawdown or quality loss.

Summitville - Understanding Some of the Factors Contributing to an Environmental Disaster. When people ask us about mining and its potential environmental impacts, they often make comparisons between the proposed Crandon project and the Summitville Mine in Colorado. The Summitville mine, permitted in 1986, is a classic case of an environmental disaster. Not only is there severe acid rock drainage impacting surface waters with resultant fish kills, but the environmental problems were compounded after the mining company declared bankruptcy in 1992 to avoid financial liability and responsibility. Now, because of Summitville's Superfund status, millions of federal dollars are being spent to avoid further serious environmental impacts from this abandoned project. "If it could happen in Colorado in the 1990s," concerned citizens ask, "couldn't it also happen in Wisconsin?" So we decided to look more closely into the sequence of events leading to permitting at Summitville to understand why such a disaster occurred. Here is a summary of the Summitville experience:

- Summitville was a gold mine, using a cyanide heap-leach type of processing;
- There was no environmental impact statement on the proposed mining plan;
- The permitted construction and operation plans were violated while being implemented, and major budget cuts prevented proper regular inspections by state regulatory staff;
- Construction of the lined heap leach pad took place during freezing and snowy conditions resulting in serious quality control problems;

- As a result of inadequately sized retention facilities, the facility actually directed runoff into the abandoned mine workings present at the site from earlier mining operations, exacerbating acid drainage;
- State bonding requirements were seriously inadequate and failed to provide sufficient funds for remediation;
- Financial mechanisms designed to cover unforeseen emergencies were lacking;
- In 1986, when Colorado approved the permit application, the state agency had only 120 days to review the application before it automatically would have been approved under state law;
- The site is in an area of historic mining activity. Waste rock dumps and mine workings were present from mining activities in the late 1800s and early 1900s. These, along with natural exposures of eroding sulfide minerals, have contributed significantly to the acid rock drainage situation;
- Waste rock capable of generating acid drainage was placed on unlined pads and used in the construction of roads, causing acid drainage problems;
- Poor design implementation allowed cyanide-laden water to leak from ruptured pipes directly into surface waters;
- The setting is in mountainous terrain at 11,500 feet elevation, where there are 50 inches of precipitation annually, brief summers and long, cold winters.

We present this information because it represents a significant contrast to the regulatory framework and existing conditions here in Wisconsin, and it goes a long way in explaining what happened in Summitville. Colorado's mining-related regulations have been strengthened since the approval of the Summitville mine. If a comprehensive mining environmental review process had been in place in Colorado in the mid-1980s, it is almost certain that the Summitville project we know would not have been approved. This reinforces the Department's conviction that a thorough review, adequate bonding measures, strong enforcement measures, and rigorous scientific analyses are critical in the mining permit review process.

Here are a few references if you wish to read further:

Bigelow, Robert C. & Geoffrey S. Plumlee. 1995. "The Summitville Mine and its Downstream Effects." An on-line update of Open File Report 95-23. U.S. Geological Survey. Internet Address: <http://helios.cr.usgs.gov/summit.web/summit.html>. 10 pp.

Danielson, Luke & Alice McNamara. 1994. "The Summitville Saga." *Clementine* (Winter 1994):7-9.

Posey, Harry H., James A. Pendleton, & Dirk Van Zyl (eds.). 1995. "Proceedings: Summitville Forum '95." Colorado Geological Survey Special Publication 38, Denver, CO. 375 pp.

V. V. King, Trude (ed.). 1995. "Environmental Considerations of Active and Abandoned Mine Lands: Lessons from Summitville, Colorado." U.S. Geological Survey Bulletin 2220, Denver, CO.

Surface Water Mitigation Plan: The Department may not issue an approval under s. 281.17(1), Wis. Stats., if the withdrawal of groundwater for prospecting or mining purposes or the dewatering of mines will result in the unreasonable detriment of public or private water supplies or the unreasonable detriment of public rights in the waters of the state.

Department staff are in the process of defining the range of public rights in all waters that could potentially be affected by the groundwater drawdown resulting from pumping out the underground mine. These rights include navigation, enjoyment of natural scenic beauty, healthful water quality, swimming, fishing, ricing, 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"). Water levels or flows will vary with natural seasonal fluctuations. 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.

If the groundwater drawdown from the mine causes public rights to surface waters to be violated, the company is required to mitigate those waters by replacing water removed by pumping. Mitigation water could come from groundwater intercepted before it seeps into the mine, or from mine water that would be treated to remove contaminants, and then pumped to surface waters. Frequent monitoring of water levels and flows would be required so that the need for mitigation water can be predicted in advance. Department staff has urged the Crandon Mining Company to use as much groundwater and treated mine inflow water as possible, thereby reducing the amount of water that would need to be discharged to the Wisconsin River.

The public rights stages, mitigation water sources, and other details are contained in a draft surface water mitigation plan the mining company has recently submitted. The plan cannot be finalized or approved until the Department finishes its review of the groundwater flow model. Details of the plan, along with the impacts of its implementation, will be released in our draft environmental impact statement. 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 Wolf River tributaries) to replace the water that it removed.

We anticipate there will be technical meetings with the company before our review is complete. Any technical meetings will be announced on our hotline phone message (608) 267-7534.

Wisconsin DNR Metallic Mining Web Site is Operational: Information about metallic mining regulation in Wisconsin, including DNR review of the proposed Crandon mine, is now available on the World Wide Web. This Web site is intended to help promote greater public understanding of how metallic mining is regulated in Wisconsin, and how the DNR is progressing in its review of current mining proposals.

From the introductory page (<http://www.dnr.state.wi.us/org/es/science/mining>) users can select information on how metallic mining is regulated in Wisconsin, and on the ongoing DNR review of the proposed Crandon mine. It also provides links to the U.S. EPA and U.S. Army Corps of Engineers Web sites pertaining to review of the proposed Crandon mine. Among the specific items available at this site (mainly in the form of portable document format files, or pdfs) are:

- a series of mining information sheets that delve in detail into the topic of metallic mining;
- state statutes and links to administrative rules pertaining to the regulation of metallic mining;
- an update on the status of the DNR review of the proposed Crandon mine;
- public comments and questions voiced at public meetings held at seven sites across northeastern and north central Wisconsin;
- comment and review letters by public agency staff examining the Crandon mine proposal; and
- a summary of the environmental impact report that was submitted by the Crandon Mining Company, and which is under review by the DNR.

Groundwater Modeling Update: This fall we provided the Crandon Mining Company with what we expect to be our final comments on the groundwater flow model. The purposes of the flow model are to help us understand the direction and rate of groundwater movement and the interaction between groundwater and the surface waters from lakes, streams, wetlands and springs. When we have completed our verification of the model inputs, we will use it to help evaluate the following questions:

- How much water would flow into the underground mine?
- What will be the extent of the groundwater drawdown?
- How will the drawdown affect water wells and surface waters?

By Christmas, we should receive most of the changes to the model that we requested. We will then verify that the model inputs were changed and continue to run it on our computers. When we are certain that the model is an accurate representation of the natural groundwater system in the area of the mine, we will use it to help evaluate impacts as shown above.

The flow model has a second major use besides helping predict drawdown impacts. It will also be used as the foundation for the solute (or contaminant) transport model. This model will help us evaluate water quality impacts to area groundwater and surface water from the abandoned mine and the tailings management area. The solute transport model uses the rate and direction of groundwater movement along with the additions to groundwater from rain and snow melt to help evaluate the impacts of contaminants in the groundwater. The Department, with the assistance of U.S. Geological Survey and Wisconsin Geological & Natural History Survey staff, has already started review of the solute transport model. We anticipate there will be technical meetings with the company before our review is complete; these will be announced on our hotline phone message (608) 267-7534.

Setting Surface Water Quality Standards and Effluent Limits: Water quality concerns are foremost on the minds of many who are concerned about the safety of mining. Many people want to know how DNR determines when surface waters (lakes and streams) are clean and healthful, and how we set limits on pollutant levels in wastewater discharged to our lakes and streams. These procedures apply to all municipal and industrial discharges in the state and are not unique to mining.

What are Water Quality Standards and Effluent Limits?

Water quality standards are a set of maximum allowable limits of pollutants in lakes or streams, as measured by their concentration *in the water of a lake or stream*. Concentrations are generally expressed as micrograms of pollutant per liter of water (abbreviated as $\mu\text{g/L}$, with one $\mu\text{g/L}$ also being roughly equivalent to one part per billion.) Extremely small amounts of mercury are measured in nanograms per liter (ng/L , or parts per trillion). The surface water quality standards for the State of Wisconsin are described in Chapters NR 102 through NR 105 of the Wisconsin Administrative Code (Wis. Adm. Code). These administrative codes contain specific numerical water quality criteria for a range of pollutants, as well as descriptions of methods to be used in calculating numerical water quality based limits for those pollutants. **Effluent limits** are a set of allowable concentration and mass limits for pollutants *in a wastewater effluent*. These limits assure that no significant lowering of water quality occurs.

How are Water Quality Standards Determined?

Water quality standards have been established in order to protect against both short-term ("acute") and long-term ("chronic") impacts on aquatic life, wildlife, and human life. All of the criteria relating to long-term impacts have been established to represent safe levels of potentially harmful substances.

Acute Toxicity Criteria. Acute toxicity criteria protect against levels of pollutants that may kill organisms in the short-term.

Chronic Toxicity Criteria. Chronic toxicity criteria protect against levels of pollutants that may impair the survival, reproduction and growth of organisms over the long term.

Methods for Developing Acute and Chronic Toxicity Criteria. The aquatic toxicity sections of Ch. NR 105, Wis. Adm. Code, are based in part on guidelines prepared by the U.S. Environmental Protection Agency (EPA) in 1985, and on EPA's ambient water quality criteria reports for 26 toxic substances. Many studies have been done on the toxicity of various pollutants to various species. Developing toxicity criteria requires calculation of an average toxicity value from the available database for each individual species. A statistical procedure is used to estimate concentrations that are harmful or lethal to only 1% of the individuals of a given species being tested. Chapter NR 105 allows strengthening of the criteria to protect species of commercial, recreational or ecological importance where necessary, or if limitations in the database used for developing criteria leave the most sensitive species unprotected.

Wildlife Criteria. Water quality criteria for the protection of wildlife establish allowable concentrations of substances in surface water that protect wildlife using the water for drinking or foraging.

To derive a wildlife criterion, DNR staff review scientific literature for mammal and bird studies useful in determining an appropriate concentration for any chemical of concern. Section NR

105.07, Wis. Adm. Code, contains numerical wildlife criteria (calculated according to procedures specified in the code) for four substances: DDT and metabolites, mercury, dioxin, and PCBs.

Human Health Criteria: Human health criteria are set to minimize the impacts or risks to humans who eat fish that build up concentrations of the potentially harmful chemicals we regulate, and who may drink water that contain those chemicals. In order to develop criteria that protect human health, we establish limits that provide an extra margin of safety. These limits are taken from appropriate epidemiological or animal dose-response studies, and are developed for both cancer-causing and non-cancer-causing substances.

How are Water Quality Standards Used?

Under Wisconsin Law, any discharge of wastewater into waters of the state must not exceed the water quality standards that apply to the lake or stream receiving the wastewater (the "receiving water"). Water quality standards in Wisconsin vary with the use of the receiving water and are factored into calculating effluent limits. Water quality standards that are most protective of water quality apply to streams designated as *outstanding resource waters* (such as the Wolf River). Other use designations include *exceptional resource waters*, *Great Lakes waters*, *fish and aquatic life waters*, and *variance waters* (generally intermittent streams and sewage treatment plant effluent discharge channels).

How are Effluent Limits Determined?

The individual chemical limits we develop are based upon water quality criteria in Chapter NR 105, Wis. Adm. Code. Limits on pollutants are set to protect the designated use of the receiving water, be protective of the most sensitive species, and prevent any significant lowering of water quality.

Anti-degradation: Ch. NR 207, Wis. Adm. Code states that no new or increased wastewater discharge is permitted that would significantly lower the water quality of the receiving water. No lowering of water quality at all is allowed for Outstanding Resource Waters (such as the Wolf River). For other receiving waters, this anti-degradation policy limits the total amount of pollutants in a new or increased discharge. The assimilative capacity is the difference between the water quality criterion for a substance, and the existing background level of that substance in the receiving water.

Considerations in Calculating Effluent Limits: The following factors are included when calculating effluent limits for a discharge:

- Classification of the receiving water, and downstream water if applicable, and the level of protection needed to maintain water quality;
- Acute and/or chronic toxicity of substances in the proposed discharge to fish and other aquatic life, based on actual bio-monitoring results;
- Health considerations in humans and other animals;

- Application of the most stringent toxicity criterion for each substance in the effluent;
- The background concentration of each regulated substance in the receiving water;
- Water hardness (a measurement of calcium and magnesium ions - toxicity of metals increases as hardness decreases);
- The degree and rate of dilution of the effluent by the stream flow of the receiving water, using a stream flow that corresponds to each type of criterion;
- Whether the receiving water is a public drinking water source;

Effluent Dilution and River Flows. The stream flow rate must be factored into effluent limit calculations. The amount of water flowing determines the degree of effluent dilution that will occur. Effluent limits are established for a variety of stream flows - for instance, the amount of permissible concentration of a pollutant might increase as flow rate increased. Stream flow calculations are based upon historical hydrologic records and precipitation data.

Calculating the Effluent Limit: A mass balance equation is used to calculate the limit, which factors in the background concentration of the substance and the amount of dilution available in the water body. For example, if the background concentration of a substance is low, there is greater assimilative capacity, so the limit can be higher compared to a limit based on a high background concentration. The smaller the effluent volume compared to the stream flow, the greater the dilution and the higher the effluent limit can be to maintain an "in-stream concentration" below the criterion.

Regulating Combinations of Chemicals

Synergistic impacts. Sometimes two or more substances can act together to produce an effect (such as interfering with cell growth, metabolism, reproduction or other vital function) that neither substance alone could produce. This is known as a *synergistic impact*. Considering the impacts of combinations of chemicals on human health and aquatic life is another important aspect of setting effluent limits. However, the potential for synergistic impact cannot typically be determined when setting chemical-specific water quality standards.

Unfortunately, it is not easy to develop meaningful criteria or limits for combinations of chemicals because it is unlikely that laboratory tests that measure the impacts on fish or aquatic life will have been done on the same chemicals in the same relative concentrations as found in a discharge. Therefore, instead of relying on chemical limits, the Department looks at *whole-effluent toxicity*. Whole-effluent toxicity tests are a means of determining the effect the entire mix of chemicals in an effluent has on aquatic life. Fathead minnows and water fleas are exposed to actual effluent to determine if there are any toxic effects. Dischargers are required to meet limits associated with both individual chemical and whole-effluent testing.

Progress Update and Project Review Schedule: The Department staff is making progress in reviewing the proposed Crandon mine. Among the most significant issues still being analyzed are potential groundwater quality impacts. In order for the project to meet state requirements, the mining project can not cause groundwater contamination that would result in a violation of groundwater or surface water standards at any time in the foreseeable future, so the pending results of the solute transport modeling are also critical.

There are several other outstanding issues as well, such as completing our review of the surface water mitigation plan, designed to protect the public rights in lakes and streams, and finishing our review of the proposed tailings management area (TMA). We have requested from the Crandon Mining Company additional testing on components that would be used in constructing the tailings facility. For example, we need additional information on whether the bentonite clay component of the proposed barrier system would maintain its low permeability when exposed to the liquid inside the TMA. We also requested further evidence that the proposed drain system would not be clogged by silt or chemical interactions deep inside the TMA. Until we can address these types of questions, we cannot complete our draft environmental impact statement (DEIS).

We are presently reevaluating our schedule for public release of our DEIS. Only after we have received all necessary permit applications and plan components, and have verified that what was submitted is adequate for our purposes, can we fully complete our analysis. From that point, it will take us about four months to complete our DEIS and release it for public review. We cannot now identify the exact date of completion. As we have always said, we will not release our DEIS before we have all of the necessary information.

**Public Concerns Regarding the Proposed
Crandon Mine Discharge into the Wisconsin River**

**A Summary of Public Comments and Questions
from the May 20, 1996
Public Meeting at Tomahawk, Wisconsin,
with
DNR Responses**

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

June 28, 1996

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Introduction

The DNR wishes to thank all of the citizens who attended the May 20 public meeting at Tomahawk as well as those citizens who submitted written comments. As was intended, the Department received many oral comments and questions during the meeting. Written comments and questions were also received that night and during the ensuing two weeks. Many of these questions raised issues that the DNR intends to analyze before publication of the Environmental Impact Statement (EIS). Several issues were raised that indicated the need for additional information, and these will direct DNR efforts for ongoing studies.

Some of the questions raised related exclusively to the mine site itself, which was not the subject of the Tomahawk meeting (other public meetings regarding the mine itself were held previously and will be held in the future). These questions are not addressed in this memo, although we have included responses to some general mining issues. Specific questions regarding the mining site itself can be sent to:

Larry Lynch (SW/3)
Department of Natural Resources
P.O. Box 7921
Madison, WI 53707.

Additional information is available in a number of mining information sheets available from the Department's Rhinelander or Madison offices. These are: *Potential Mining Development in Northern Wisconsin*, *Cumulative Impacts of Mining in 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*, 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 on May 20 in Tomahawk. The Department has made an effort to include each comment that was raised. In the many instances that several individuals asked similar questions, an attempt was made to accurately paraphrase the general question while capturing the essential meaning. Of course, with the magnitude of comments received on this issue, 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 above address. The questions and comments are written in bold type, and the Department responses follow each question in regular type. Where Wisconsin Statutes are paraphrased, the reader is advised to check the original language if more complete information is desired.

Exxon and Rio Algom's past environmental records

1. The parent companies of Crandon Mining Company (CMC), Exxon and Rio Algom, have long records of environmental degradation and therefore should not be trusted with this project in Wisconsin. Does the DNR take into account the previous history of the companies applying for permits?

By state law, only under any one of three conditions could a mining permit be denied due to the company's environmental track record: forfeiture of a prior mining reclamation bond, prior conviction for violating an environmental law, or failure to reclaim a previous mining site. Therefore, these conditions are considered in the DNR's review process; other environmental track record considerations not related to mining projects, such as the oil spill in Prince William Sound, are not. These three situations are detailed below; for exact language please refer to the statutes.

- Forfeiture of prior bond: According to s. 144.85, Wis. Stats., the mine permit will be denied if CMC, Rio Algom, or Exxon has forfeited a mining reclamation bond in the U.S. within 10 years before submitting the application.
- Violation of environmental law: Also under 144.85, the permit would be denied if CMC, a related person, or an officer of CMC has, within 10 years before the application is submitted, been convicted of more than one felony for violations of laws for the protection of the natural environment arising out of the operation of a mining site in the United States, unless one of the following applies:
 - a) The person convicted has been pardoned for all of the felonies;
 - b) The person convicted is a related person or an officer or director of the applicant with whom CMC terminates its relationship; or
 - c) CMC includes in its permit application a plan to prevent the occurrence in this state of events similar to the events that directly resulted in the convictions.
- Failure to reclaim mine site: The permit would also be denied if a mining permit or other mining approval issued to the applicant or a related person was permanently revoked (within the last ten years) because of a failure to reclaim a mining site in the United States in violation of state or federal law and that failure has not been and is not being remedied.

The records of other dischargers

2. How many times have the Flambeau mining project and all other dischargers into the Wisconsin River in the Rhinelander/Tomahawk area exceeded their discharge permit limitations? Have they failed bioassay tests or had compliance violations? Will this affect CMC's permit limit determinations?

There are two general means of evaluating discharge limitations - chemical specific effluent limits (testing for the presence of a specific chemical) and whole effluent toxicity tests (a type of bioassay test). Whole effluent toxicity tests are run by exposing fathead minnows and water fleas to the undiluted effluent. In Wisconsin, it is rare for a permit to have a whole effluent toxicity limit, although testing is frequently required.

The Flambeau Mine has not violated any chemical specific effluent limits in its permit. They have failed some acute whole effluent toxicity tests, which resulted in a permit limit for toxicity. There was one violation of this permitted limit in February 1995 and the company was issued a Notice of Noncompliance. Flambeau Mining Company has since been in compliance with no subsequent whole effluent toxicity violations.

The other dischargers into the Wisconsin River in segment A, which includes the stretch from Rhinelander to the Grandmother Dam south of Tomahawk include: Rhinelander Paper, American Tissue, Tenneco Packaging, the City of Tomahawk, and the City of Rhinelander. Their history of violations for the last 12 months (April 1995 through May 1996) are listed below. Included is whether the dischargers are passing their whole effluent toxicity testing. The failures for whole effluent toxicity tests don't count as violations because none of the dischargers has whole effluent toxicity limits, only monitoring requirements. The performance of these dischargers may affect the effluent

limits for the Crandon Mine if they contribute to background levels used in the calculation of limits for the Crandon Mine. The information given during the presentation regarding comparisons between discharge levels is attached as Appendix A.

Rhineland Paper: 5 violations consisting of 2 pH, 1 temperature, 1 suspended solids, and 1 wasteload allocation. Whole effluent toxicity tests pass.

American Tissue: 19 violations consisting of 2 pH, 10 BOD, and 7 wasteload allocation. Whole effluent toxicity tests are failing, and retesting is being done. The permit reissuance may contain whole effluent toxicity limits.

Tenneco Packaging: 1 violation for suspended solids. Whole effluent toxicity tests had 1 failure, but subsequent tests passed.

City of Tomahawk: 20 violations consisting of 14 suspended solids, 1 residual chlorine, 4 BOD, and 1 wasteload allocation. Whole effluent toxicity tests pass.

City of Rhineland: No violations. Whole effluent toxicity tests pass.

General mining and permitting questions

3. Governor Thompson is responsible for numerous changes in state mining laws over the past several years that have weakened the laws so much that neither adequate environmental protection nor a fair return in fees to the state is possible. When looking at these loopholes, it becomes obvious that we do not have the toughest mining laws in the nation.

First, we would like to emphasize that many of the laws and rules that apply to mining projects are not part of the "mining" laws and rules. For example, our regulatory authority concerning air quality, wastewater discharges to navigable waters such as the Wisconsin River, disposal of mining wastes, wastewater treatment plant review, mine dewatering and approvals related to navigable waters are not part of the mining laws. In fact, within the past several years, the authority within these regulations has been strengthened.

The statement that the mining laws have been weakened is commonly made. However, it is incorrect. Over the past ten years there have actually been very few changes made to the mining law in Wisconsin, and the significant changes which have been enacted were all intended to strengthen the law. The three most substantive changes were 1) creation of the local agreement process, an optional process that empowers local units of government to control aspects of proposed mining projects which are beyond state control, 2) inclusion of a provision which makes preparation of an Environmental Impact Statement mandatory for any proposed mining project, and 3) incorporation of provisions dealing with consideration of an applicant's performance history at other mining operations in the United States as part of the evaluation of a mining permit application (see response #1).

The question of whether the state receives adequate compensation from mining is a policy question the legislature addressed when it revised the net proceeds tax many years ago. The net proceeds tax is a profits tax on mining companies. No other industry has such a tax. Mining companies also are subject to property taxes and corporate income taxes.

4. The review of the mining permit cannot be fair and unbiased because of Department of Administration Secretary Klauser's previous involvement as a lobbyist for Exxon Corporation and because DNR Secretary George Meyer is now appointed directly by Secretary Klauser's friend, Governor Thompson.

We are aware of these issues that are frequently raised. Fortunately, there are many more 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, and to request 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.

State mining law requires that 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. As was done at the Flambeau Master Hearing, the Department will invite any member of the public to question these staff members, who will be under oath, regarding how they arrived at their conclusions. Additionally, 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.

5. To this date, what does the DNR believe is wrong with this proposal?

The process of reviewing a permit application can stretch out several years. CMC has submitted their initial data and plans to the DNR for review. At times, the DNR has found some of that information to be inadequate. The DNR has submitted several project review letters to the mining company requesting new or additional information from the company. CMC has provided the new information or initiated the revised study requested by DNR. DNR staff and consultants have provided hundreds of hours of review to the company's plans and have made many requests for improvements to designs proposed by CMC.

Because this DNR permit review is an evolving process, we will not be able to assess whether any aspect of the project would fail to meet applicable environmental protection standards until the review is complete and CMC has provided its final responses to the remainder of DNR's comments and requests.

Base-line conditions

6. What are the current toxic metals in the river water and river bottom material and what are their amounts?

Virtually all heavy metals are naturally occurring to a small extent, mostly as a result of their geologic presence. Therefore, all of the heavy metals for which the DNR and Environmental Protection Agency have water quality criteria are present in the water and sediment. The following table summarizes some applicable concentrations. The column labeled Existing are "background concentrations" of heavy metals in the upper Wisconsin River. For most heavy metals, the magnitude of the water quality criteria for aquatic life protection is dependent upon the hardness of the water. For these metals, toxicity increases as hardness decreases (more toxic in soft water). The water quality criteria indicate the concentration of the substance in the water at which adverse effects to aquatic life, wildlife, or humans would not occur. Acute concentration refers to a level which protects against mortality. Chronic concentrations refer to a level which protects against sublethal toxicity (for example, problems with growth and reproduction).

The effluent concentration numbers in the table would be used to determine the need for a water quality based effluent limit according to s. NR 106.05, Wisconsin Administrative Code (Wis. Adm. Code). For substances where the effluent concentration is greater than the water quality criteria (WQC) there is greater likelihood that a water quality based effluent limit may be included in the discharge permit.

	Existing Wisconsin River ¹	Effluent Sample ²	Acute WQC ^{3,4}	Chronic WQC ^{3,5}	Human Health WQC ³
Arsenic (µg/L)	0.5	0.3	364	153	50
Cadmium (µg/L)	0.0056	0.03	60	0.13	82
Chromium (µg/L)	0.33	0.38	3165	21	9,500,000
Copper (µg/L)	0.33	5.7	30	3.9	no criterion
Lead (µg/L)	0.16	0.016	383	2.4	50
Nickel (µg/L)	0.38	4.9	1855	25	460
Selenium (µg/L)	0	110	58	7.1	170
Silver (µg/L)	0.012	0.024	4	0.5	430
Zinc (µg/L)	1.2	2.9	178	19	no criterion

¹ These numbers are from Hat Rapids dam and could change pending collection of additional data.

² From the bench scale treatability pilot study collected April 26, 1995. Additional parameters can be found in Appendix B.

³ WQC refers to ambient water quality criteria. The WQC are implemented via ch. NR 106, Wis. Adm. Code, to derive effluent limits which may be higher because of dilution factors.

⁴ Allowable acute effluent limits are twice the *acute* criterion, multiplied by a dilution factor that takes into account the mixing effect of discharging into the turbine intake.

⁵ Allowable chronic effluent limits are based on the *chronic* criterion and a mass-balance equation that takes into account dilution effects and background concentration of the substance. The chronic limits will be greater than the criteria, based on the amount of dilution in the receiving water.

Note: These numbers are for explanatory purposes and may change as the review process proceeds, based on further information and different water hardness data (see response #18). For a discussion of mercury, refer to responses #8 & #22.

µg/L = micrograms per liter water where 1 µg = one millionth of a gram per liter)

For sediments, refer to response #8 for a discussion of future monitoring to attain existing concentrations of heavy metals in sediments.

7. In the presentation given by the DNR, why were so many heavy metals ignored when comparing existing industry to the proposed CMC discharge?

The DNR compared copper, lead, and zinc in its presentation because these are the metals that would be mined, so they may be of concern, and were appropriate to use as examples. The other metals were not ignored during our preparation for this presentation. Data is available for them but wasn't presented due to time constraints and redundancy in the comparisons. Appendix A contains the comparisons for copper, lead, zinc, and BOD. Appendix B contains the quantity of metals in CMC's proposed discharge. Many of these metals are not regularly monitored by industries and municipalities because they have not historically been at levels of concern in their discharges.

8. The DNR has an inadequate data base on the present levels of existing heavy metal contamination and methyl mercury accumulation in the Wisconsin River.

The Department has a sound database for concentrations of heavy metals other than methyl mercury in the Wisconsin River. Department staff collected water quality samples from below the Hat Rapids dam for metals analysis during 1996. For a number of years, the WDNR has collected metals data from many Wisconsin rivers, including the Wisconsin River, using new methods. Wisconsin is one of the first states to obtain reliable metals data for surface waters. Reliable measurement of methyl mercury in surface water is very difficult. Total mercury

concentrations are easier to measure and are more applicable to water quality criteria; therefore, total mercury is used to regulate discharges. However, methyl mercury is much more readily absorbed by organisms than other forms of mercury. Because of this, the worst case scenario is assumed for purposes of regulation. Although the percentage of methyl mercury in total mercury concentrations is generally 5 or 10 percent, for the purposes of regulation it is assumed that 100% of mercury measured in background concentrations and in discharges has the potential to be converted to methyl mercury. Therefore, it is not necessary (although it is interesting scientifically) to maintain a database on methyl mercury concentrations in surface waters.

For river sediments, the database is less complete, especially between Hat Rapids Dam and Kings Dam. Accordingly, the DNR is planning additional sediment sample collection below Hat Rapids Dam, below Menard Island, in the Wisconsin River arm of Lake Alice, in Lake Alice's southern basin south of the Wisconsin River arm, in Lake Alice north of the Shorewood Road public landing, and in Lake Alice above Kings Dam. For sediments, it can be important to obtain the concentration of methyl mercury and total mercury. This is because the concentration of mercury in sediments is many times the concentration in the water. Further addition of sulfates, as would be present in the treated mine wastewater, could increase the rate at which mercury is converted to methyl mercury. The DNR's tests will analyze how much the sulfates in the sediments and water contribute to the formation of methyl mercury. See response #22 for additional information regarding mercury.

9. There should be a scope of study prepared by the DNR for the proposed discharge. It should be a full one year (five year was also mentioned) study of baseline conditions on the Wisconsin River water and sediments above and below Hat Rapids Dam, and should include weekly sampling for Ph, microbiological and radiological parameters, inorganic chemicals, lead, copper, and synthetic and volatile organic chemicals. This study should include estimates of the impact of the discharge on all the constituents tested for during the one-year study. The department should release these test results to the public.

As mentioned in the previous response, there is adequate surface water data for the Wisconsin River for many substances. For those substances for which we do not have an adequate understanding of the river situation, additional monitoring data will be collected. The sediment monitoring mentioned previously is planned for 1996 and will augment the existing sediment database for review purposes. Additional measurements of many of the water criteria are being taken and will increase our level of understanding of the upper Wisconsin River. All data necessary for the review of the discharge and potential impacts to the surface waters will be (and is) available to the public as the review process proceeds.

Additional endangered resource surveys are also in progress at appropriate locations below Hat Rapids. (See response #14.)

10. How can an EIS be released without this background information?

There are two levels of data needed for the evaluation of any project. The first is the data needed to set permit conditions and to assess potential environmental impacts. The EIS will not be released without the information necessary to determine impacts of the project. This is being addressed as indicated in the responses to questions #8 & #9. The second level is the collection of additional baseline data as part of an environmental monitoring plan. The monitoring is designed to verify impact predictions and to assess any changes or trends that could result from the operation of the facility. This data is normally collected during the year prior to the start of the discharge. The facility monitoring plan would address the need and methodology for the collection of this data.

11. The BOD levels are already fully allocated for the Wisconsin River.

Bio-chemical oxygen demand (BOD), represents organic material which is consumed by organisms and bacteria, which in turn depletes the oxygen in water. The concentration of BOD in the surface water determines how much depletion of oxygen occurs. BOD can cause a temporary decreases in oxygen levels in surface water. After the organic material is consumed, normal oxygen levels would return. We have not yet determined the degree of significance of the BOD mass from the proposed discharge as compared to background levels or to other local BOD sources (discharges). This will be determined as part of the permit review process.

Segment A of the Wisconsin River, which includes all the dischargers in Appendix A, is fully allocated for BOD. The proposed discharge from the Crandon Mine would contain very little organic waste. If the Department determines that the amount of BOD from the proposed discharge is insignificant, such that it wouldn't decrease dissolved oxygen in the Wisconsin River, the discharge may be allowed without changing the existing allocations. If the discharge is significant, CMC would need to reduce BOD in its discharge or acquire some wasteload allocation from an existing discharge in order to get the permit. To do so would involve notification to interested members of the public, as well as the opportunity for comment at public hearings.

The discharge from the Crandon Mine is proposed to enter the river at the Hat Rapids Dam. The river below this site is free flowing for several miles. Previous surveys taken during the wasteload allocation development in the late 1970s consistently indicated that oxygen levels decreased as upstream water moved toward the dam, but that the stretch of river below the Hat Rapids dam always went up in dissolved oxygen due to the excellent re-aeration potential of the free flowing river compared to the more sluggish and deeper water above the dam. Also, highly organic sediment deposits that contribute to oxygen uptake are numerous above the dam but are absent below the dam due to the scouring action of the faster moving water. Thus the river below the dam is a "recovery zone" that has higher assimilative capacity than Hat Rapids Flowage does. The Wasteload Allocations were designed to address the assimilative capacity of the flowage area above the dam for this reason. Accordingly, a small discharge of BOD into the recovery zone may be determined to be inconsequential to the Wasteload Allocation.

12. We have made tremendous progress in the last few years toward improving Wisconsin River quality - this discharge would be a step backwards.

Comparisons with existing permitted discharges (see Appendix A) demonstrate the proposed discharge from the Crandon Mine, if determined to be accurate, would not be a significant contributor of flow or pollutants. Any new or increased discharge into waters of the state cannot be outright prohibited by the Department. The users of waters of the state, including municipalities and industry, are entitled to due process under the laws and administrative codes regulating wastewater discharges. These regulations are designed to prevent any significant lowering of water quality (see response #15) and to protect the use classification of the water. If a proposed discharge meets the water quality limitations, it will be permitted. And if it doesn't, the discharge would be prohibited.

13. Does the Wisconsin River have special considerations under the drinking water criteria used to calculate permit limits? Maximum contaminant levels should be set forth for all materials listed on the EPA test list for drinking water.

Drinking water criteria are not applicable for the Wisconsin River because the Wisconsin River is not a public source of drinking water for any municipalities or Tribes.

14. A local biology teacher has found individuals or populations of three rare dragonflies in the Wisconsin River below Hat Rapids Dam. Has this area in the Wisconsin River been surveyed by the DNR for endangered and threatened species? How will the discharge affect them?

DNR staff recently inventoried the Wisconsin River downstream of the Hat Rapids at the Camp 10 landing. They located 17 species of Odonates (dragonflies), 5 of which are rare (4 State Special Concern and 1 State Endangered). Based on these occurrences, CMC is conducting surveys for rare Odonates from the discharge site at Hat Rapids Dam downstream to Menard Island (which is downstream of the Camp 10 landing). This survey is similar in scope and detail to those that were conducted for the Wolf River and its tributaries and is expected to accurately determine the presence of rare Odonates, mussels, plants, and invertebrates in this reach of the Wisconsin River. The Department will verify the data collection process.

Under existing state water quality regulations, the Department cannot permit the discharge of pollutants in concentrations that are expected to harm any known species, including rare species. If toxicity data on these rare species (or similar species) warrant lower effluent limitations, the limitations would be reduced in order to prevent those species from being harmed. This process has taken place elsewhere, such as at the Flambeau mine.

15. The DNR needs to acknowledge that anti-degradation standards prohibit any further lowering of Wisconsin River water quality, because the mine (a new pollution source) does not meet the requirement of being "in this area."

Since the proposed discharge would be to the Wisconsin River, it will be evaluated under the anti-degradation standards. The anti-degradation clause in NR102 states "No waters of the state shall be lowered in quality unless it has been affirmatively demonstrated to the department that such a change is justified as a result of necessary economic and social development, provided that no new or increased effluent interferes with or becomes injurious to any assigned uses made of or presently possible in such waters." The mine will not be permitted if it cannot discharge water that meets all water quality based effluent limits. (See response #12.) There is no specific area requirement referring to the distance between the discharge and the economic development.

Whether a "lowering of water quality" occurs is dependent upon a contaminant's significance. Significance is found by accounting for all dischargers in a certain river section and subtracting this from the total assimilative capacity (the level at which any further addition of that contaminant would produce toxicity). The remainder is the amount of contaminant that the river can still absorb without causing toxic effects on fish, wildlife, and humans. If a proposed discharge is greater than one third of this remaining capacity, the discharge is deemed a significant lowering of water quality.

16. What is the basis for the water quality standards that are in effect for Lake Alice and the flowing sections of the Wisconsin River below the proposed discharge point?

The water quality standards (numerical water quality criteria) which apply to the Wisconsin River below the point of discharge are those necessary to protect the surface water according to the classification given to the Wisconsin River. The Wisconsin River at and below the point of proposed discharge (including Lake Alice), is classified as a warm water sport fish community. The classification system is outlined in Chapter NR 102 of the Wisconsin Administrative Code. Toxicologically, the water quality criteria which apply to a warm water sport fish community are based upon published data from studies using species which occupy (or have the potential to occupy) a warm water sport fish community. For protection of the aquatic life (acute and chronic) a water quality criterion can only be calculated if data is available for various organisms including fish, crustacea, insects, and zooplankton. For human health protection (consumption of fish, ingestion of the surface water, or recreational contact), water quality criteria for carcinogens and non-carcinogens will be considered and will apply to the discharge if needed according to s. NR 106.05, Wis. Adm. Code. For wildlife protection, water quality criteria are based mostly upon harm to growth and reproduction as a result of exposure to chemicals in surface water or consumption of fish. For protection of aquatic life, human health, and wildlife, the water quality criteria are published and discussed in ch. NR 105, Wis. Adm. Code.

Generally, it is the wildlife criteria that is the most stringent standard (least allowable contamination) due to continual wildlife contact with the water and the amount of knowledge on wildlife effects. The most stringent standard is used in calculating permit limitations.

17. There is a table of Metals Concentrations and Concentrations Normalized above and below the Hat Rapids Dam. This table indicates that copper, lead, mercury, selenium and zinc exceed standards for beach and in-water disposal above the Hat Rapids Dam and do not exceed these standards below the Dam. Doesn't this indicate the effect (the discharge) will have on Lake Alice, where the next dam is located?

The commenter is probably referencing guidelines developed by the Department in the 1980's to evaluate the potential beneficial use of dredged material on eroding beach areas along the Great Lakes. The guidelines ensure the quality of dredged material will be compatible with existing beach material. The metal values in the guidelines are based on bluff and bottom samples in the Great Lakes. Any comparisons of sediment quality above and below the wastewater discharge (pre- and post) to the Wisconsin River must be based on sediment samples specific to the watershed. It is inappropriate to be using guidelines developed for Great Lakes areas with inland waterways. The areas behind dams are generally low energy (low water volume flow) areas where fine material carrying natural or man-made metals are deposited. See other responses related to sediment quality and issues related to the

deposition of suspended sediments to depositional zones along the river for a discussion of how the various sediment related issues will be addressed.

The composition of the wastewater

18. Does the DNR really have any idea of what levels of contamination cause distress in organisms?

The toxicity of heavy metals to aquatic organisms is very well understood from tests done in a laboratory setting. The basis for Wisconsin's water quality criteria are published, peer-reviewed studies which evaluate the relationship between heavy metal concentration and toxicity. For many of the heavy metals, the relationship can be very complex since toxicity is related to other water quality parameters such as hardness. These particular metals (e.g. lead, copper, cadmium, zinc) become more toxic in soft water. So, the water quality criteria for these metals are more stringent in northern Wisconsin where the surface waters are generally softer than those in the southern portion of the state. Chapter NR 105, Wis. Adm. Code details how water quality criteria are generated. The procedure is statistically based and has requirements for the quality of the data used. In addition, data must be available for a variety of organisms before a water quality criterion can be generated. For example, data must be available for fish, insects, invertebrates, and benthic (bottom-dwelling) organisms.

Since a laboratory setting is not always representative of what occurs in the natural environment, many conservative assumptions are made when the surface water quality criteria are converted into effluent limits to apply to a discharge pipe. For example, the amount of river flow that a discharger may use for "assimilating a substance" is one-quarter of the lowest seven-day flow which occurs every ten years (on average).

Other uncertainties regarding water quality criteria include accounting for a portion of a discharged metal which is not bioavailable. Bioavailability refers generally to the potential of a chemical to cross the a gill membrane, intestinal wall, or other biological membrane. Anytime there is a substance in the water, some of the substance (especially heavy metals) is more bioavailable to aquatic organisms than the rest. In many cases, bioavailability relates directly to toxicity. Because chemicals in water exist in different physical and chemical forms, bioavailability can vary greatly. For example, if metals are tightly bound to particles, the toxicity which could result from that portion of the metal is reduced. These are the types of issues which must be addressed as the review process continues and we gain more information.

19. Treated mine wastewater (effluent) contaminant concentrations are "based on bad science" and must be recalculated, according to a report by a consultant to the DNR.

The report referred to deals with predicting and describing the chemical nature of the mine tailings and waste rock that would be stored near the mine site. It does not have any significant relation to the proposed mine wastewater discharge to the Wisconsin River, which would be composed primarily of treated mine drainage water, intercepted groundwater, and storm water runoff.

In general, the DNR hires consultants specifically for the purpose of reviewing and verifying the preliminary data. In fact, the report referred to has resulted in substantial changes in the testing methods used by CMC for the tailings. But again, this would not substantially affect the discharge of treated wastewater or the setting of discharge limits.

20. The proposed discharge would be toxic. What is the basis for deciding what pollutant concentrations would be allowed in the mine effluent? Metallic sulfide discharge into the river will cause fish kills. The combined synergistic and long-term accumulation effects of the individual pollutants need to be addressed in a comprehensive manner.

The proposed discharge would not contain concentrations of substances that would be toxic, as discussed in response #21, and would not cause fish kills. If it were determined to be toxic, it would not be permitted.

First of all, the individual chemical limits we develop come from water quality standards or criteria in ch. NR 105, Wis. Adm. Code, which applies to all wastewater discharges in the state. The discussion that follows reflects our

standard approval procedures. Those criteria protect against short- and long-term impacts on aquatic life (fish and the organisms on which they feed) and long-term impacts on wildlife and human health. All of the criteria relating to long-term impacts are already set up to represent safe levels, to try and catch what we call "threshold levels," or levels which may cause borderline or minimal impacts. Additional protection is provided to aquatic life and wildlife by the fact that we use dry-weather stream flows to calculate limits. This is an issue because these long-term criteria must be met at the edge of a "mixing zone," so we use dry-weather stream flow and effluent flow volumes to convert that edge-of-mixing-zone criterion into a limit on the discharge point (usually a pipe outlet). Since we're dealing with long-term impacts, we assume that over time there would be some mixing of an effluent discharge with the stream into which the discharge occurs. However, by using a conservative, low stream flow to calculate that mixing, the overall impacts would be reduced and we would end up with an effluent limit that is protective of water quality during both dry and wet weather periods.

When it comes to calculating limits based on human health protection, the issues are a little bit different. There, we try to minimize the impacts or risks on humans who either eat fish that build up concentrations of the chemicals we're regulating, or who drink water that contain the chemicals we're regulating. In order to develop criteria that are protective of water quality, we look at establishing conservative values in the types of fish or the amounts of fish that people eat. If we develop criteria based on fish that accumulate regulated pollutants most quickly, if we consider that Wisconsin residents eat more fish than the national average, or if we develop criteria that protect humans from exposure to these chemicals over an average lifetime, then we have a greater assurance that we're coming up with criteria that are more protective of state residents because we build in these additional 'safety factors'.

On the other hand, criteria based on short-term impacts to aquatic life are related to levels which may kill or immobilize organisms, which admittedly do not appear at first glance to be something which would be protective of water quality. That's where we have to build in other safety factors to assure ourselves and the public that we really are doing what we can to protect water quality. One example is the fact that the short-term aquatic life criteria are based on a very high level of protection of the aquatic organisms with test information for the chemicals we're regulating.

By considering a high level of protection, criteria that are based on impacts to fish and organisms that are highly sensitive to a specific chemical will be protective of those that are more tolerant of the same chemical, so already we're developing criteria which protect a large percentage of the population. In addition, we don't normally consider any type of mixing between the effluent and the river in developing limits based on short-term aquatic life criteria. (Mixing is considered when we look at long-term impacts such as those discussed earlier.) The only time we'd consider any type of mixing in these situations is if there is rapid mixing provided at the discharge location, but these situations are rare. This is being considered in the case of CMC, though, with the proposed discharge to the Wisconsin River at the Hat Rapids Dam. There, a larger amount of mixing than normal is expected (and expected more rapidly than normal) in a discharge at the dam spillway, instead of a typical discharge near a river's shoreline.

All of the above considerations deal with individual chemicals. The issue of impacts associated with combinations of chemicals (synergistic impacts) is important as well. Of concern are impacts to aquatic life, wildlife, and humans. For all criteria, it is difficult to develop effluent limitations because of the multitude of potential chemical interactions and the lack of research dealing with those combinations. For protection of aquatic life, the Department looks at "whole effluent toxicity." In these cases, the discharger actually performs short- and long-term tests on fish and other organisms using the appropriate mixtures of effluent and stream flow. Doing the same tests on the whole effluent discharge under the same guidelines as those which were done on individual chemicals gives us an indication of what the overall impacts of the discharge would be on aquatic life. The Department typically requires whole effluent testing along with specific chemical testing in order to make sure fish and other aquatic life are protected against short- and long-term impacts associated with individual chemicals and with combinations found in the actual discharge, and dischargers are required to meet limits associated with both.

Determination of synergistic impacts to human health and wildlife is a much more difficult task which the scientific community is just beginning to address. Often non-human (mostly rat) toxicity data for individual chemicals is used to assess potential effects on humans, due to the obvious impossibility of using human data. The difficulties and uncertainties associated with this technique are increased when the toxicity of chemical mixtures is considered.

The amount of peer-reviewed scientific information which specifically addresses synergism in humans or wildlife is small.

Synergism, especially in humans or wildlife, is an issue that goes beyond the review of the Crandon Mine proposal and the information does not exist at this time in sufficient amounts for the Department to utilize in this or other discharge proposals. Toxicologists around the world are just now beginning to address synergism using modern techniques to evaluate possible toxicity and other effects due to exposure to chemical mixtures. The Department is keeping abreast of the evolving field of human and wildlife synergistic toxicological research, and will adjust the existing regulation as needed to account for the results of this research if and when it becomes available. It would not be appropriate for the Department to adjust its regulations at this time to account for synergism, or even any assumptions related to synergism, without the existence of good supporting data.

21. What will be in the Crandon Mine discharge water and how will it affect (add to) the existing condition of the Wisconsin River water and bottom structure? How far down the river will these toxic metals go? CMC should supply an estimate of its discharge contents each week for a one year period, including Ph and any material harmful to fish, wildlife, or humans.

As listed in Appendix A, comparisons with the current permitted discharges demonstrate that the proposed discharge, if determined to be accurate, from the Crandon Mine wouldn't be a significant contributor of flow or pollutants. The DNR has reviewed CMC's pilot treatability study, which estimated levels of substances in the effluent. This information is in Appendix B. The Department is still in the process of determining which substances might be present in concentrations at a level of concern, which would result in permit requirements for monitoring and/or limits for that substance. The metals which would be mined would be specifically considered.

Any wastewater permit issued would prohibit the discharge of metals or other substances in toxic amounts that would cause toxic accumulation. (See response #6 regarding determinations of toxicity.) Metals do have a tendency to attach to sediments, and might be carried far enough to be deposited in areas of low current, such as Lake Alice. (As mentioned in response #25.) However, the total amount of metals to be discharged is very small. Studies will be conducted to supplement existing information regarding baseline sediment and water conditions. If the proposed discharge meets the water quality limitations, it could be permitted, and if it doesn't, the discharge would be prohibited.

If a permit were issued for the Crandon Mine, the permit would require regular monitoring for pollutants that may be present in a mine discharge. Such monitoring would continue throughout the life of the permit at an appropriate frequency such as daily, weekly, or monthly, in order to monitor compliance with discharge limitations. Effluent limits would be included for those substances that require regulation if their concentrations are at a level of concern. Compliance with effluent limits would prevent the significant lowering of water quality, to protect fish, aquatic life, wildlife, and humans.

22. How much mercury would the DNR allow to be dumped into the Wisconsin River in the mine wastewater?

The regulation of mercury for this proposed discharge would follow guidelines identical to those for all industrial and municipal facilities. The amount of mercury which can be discharged to the Wisconsin River would be equal to the allowable level in the river (namely the water quality criterion times the flow downstream of the proposed discharge point) minus what is already present in the river (background concentration times background flow). This approach is used to calculate discharge limits for any substance where background concentrations are less than the criterion. For a discharge of mercury at the Hat Rapids Dam, the limit would be as follows:

$$\text{Limit} = [2 \text{ ng/L} \times \text{total downstream flow}] - [\text{background stream flow} \times \text{background concentration}]$$

where:

2 ng/L = The wild and domestic animal criterion for mercury (1 ng/L = one billionth of a gram per liter)

Total downstream flow = The proposed discharge rate from CMC (600 - 1200 gallons per minute) plus the 30-day low flow in the Wisconsin River found once in five years (376.55 cubic feet per second, or approximately 169,000 gallons per minute)

Background stream flow = 169,000 gallons per minute (see above)

Background concentration = The existing concentration of mercury in the river at the proposed discharge site

The procedure for calculating a limit is fairly simple and straightforward, but there is a complicating factor which makes the use of this approach difficult for mercury. First, the water quality criterion is so low (2 ng/L, based on protection of wildlife) that mercury is difficult to measure using testing procedures which are commonly available at this time (tests capable of detecting mercury levels as low as 20-50 ng/L). The use of these less sensitive test methods may give results that aren't accurate, or may give the false impression that mercury isn't present. Mercury is difficult to detect and measure at low levels. It is a substance that is considered to be universally present. Its presence in rivers or lakes may be due to wastewater discharges or to atmospheric deposits. As a result, a test which indicates mercury isn't present may warrant the use of a different test method, one which is more sensitive to the presence of mercury.

Other methods are available which can measure mercury down to more precise levels (even down to .05 ng/L), but those methods are much more expensive and not as readily available. Also, these methods have not been EPA approved. The EPA specified test only specifies a detection level of 200 ng/L. Generally, dischargers are only required to perform EPA specified tests. However, CMC has agreed to use a more sensitive method. Where more sensitive methods have been used elsewhere in Wisconsin, much different results were obtained than those which were generated using the less precise methods. The DNR has recently issued a strategy paper addressing the regulation of mercury, including a statement which advises requiring industries and municipalities to monitor for mercury using the more sensitive, but more expensive, methods.

In a sample collected by DNR on March 4, 1996 using a test method which can detect mercury at lower levels, the background concentration of mercury at the Hat Rapids Dam was measured at 2.2 ng/L, which exceeds the criterion. Where background concentrations exceed the criteria, no mixing with the background stream flow is allowed under NR 106; the effluent limit would then be equal to the 2 ng/L criterion. With only one result, it is difficult to know if this one result is representative of levels in the Wisconsin River, although the result was consistent with test results from other sites in Wisconsin using the same method. More data are being collected from the Hat Rapids Dam in order to determine what the background concentrations are, so that limits can be calculated using the procedure described earlier. Refer to response #8 for additional information on mercury.

23. How can CMC guarantee that process water will not be discharged?

Some process water would enter the mine as part of the backfill slurry. Any drainage from the backfill would be mixed with other contaminated mine water and pumped for treatment. Treated water would be used to replenish the process water circuit or discharged if not needed. In addition, process water may be treated if precipitation exceeds evaporation and the water in the tailings ponds exceeds its capacity, or if there is a build up of contaminants in the recycle water. Process water, including the tailings pond water and leachate, would also be treated and discharged when the mine is being closed. In all cases, the process wastewater would be sent through the wastewater treatment system and would have to meet effluent limits before it could be discharged.

24. The DNR's information regarding the mixing of the pollutants and the already polluted Wisconsin River is insufficient. For instance, will the discharge affect sediment quality? The micro-particles discharged in suspension could lead to added turbidity of the Wisconsin River. What about re-suspension of sediment?

The DNR reviews the mixing of wastewater with the receiving water to determine the allowable "dilution factors." These dilution factors are used in calculating effluent limits (the permissible concentrations of pollutants that can be discharged in wastewater). Using established procedures, which apply to all wastewater discharges, we determine what the zone of initial dilution (small area - the "end of the pipe", factored to prevent acute toxicity to fish and aquatic life) and mixing zone (slightly larger area in which the discharge is diluted - this area would not experience acute toxicity, but may experience chronic toxicity within its borders) are. (See response #20 for further explanation). When these mixing determinations are made, a conservative approach is taken using low flow stream conditions and maximum effluent flow. A discharge into the turbine intake at dams is beneficial to the environment, because it provides rapid mixing and dilution of the wastewater with the river to reduce the size of pollutant plumes.

The wastewater permit would establish limits on the heavy metals and solids content. The wastewater treatment system would be effective in removing metals and suspended solids because of the precipitation and filtration processes. Effluent limits must be met for a discharge to occur. This would control and limit the metals that reach the system and ultimately would be deposited in areas in downstream flowages and depositional areas along the river. It would also limit any increases in turbidity. In fact, the effluent probably would contain fewer sediments than the river water, and the discharge should not result in re-suspension of additional sediments, because the rapidly flowing water downstream of the dam maintains a well-scoured river bottom.

We are currently reviewing a monitoring plan to characterize sediment quality and establish baseline conditions. We can then compare future sediment contaminant levels to the baseline (existing) condition, to identify and measure any changes that might occur. Some components of such a monitoring plan include chemical analysis for a group of parameters including those that may be in the mine effluent.

To assess sediment transport potential for the re-suspension of sediment-bound pollutants, sediment collection traps, sediment dating, and chemical analysis at depth will allow an assessment of sediment mixing, transport, and fate. Sediments to be assessed will be those containing the finer mineral and organic compounds to which many pollutants generally adhere. These sediments are common in impounded areas and flowages.

25. What would be the impact on each settling basin (impoundments behind the dams) on the Wisconsin River downstream of Hat Rapids dam, as a result of the discharged pollutants?

The deposition of particles laden with pollutants is a legitimate concern. When pollutants are discharged, they frequently attach to fine organic particles, which then move downstream and become deposited in areas of low energy along the river in impounded areas. As mentioned previously, data will be collected regarding current sediment quality to establish a baseline for comparisons and to predict the impact of the discharge. However, because of the effectiveness of the treatment process to remove sediment and silt, the discharge would contribute only very tiny amounts of sediment.

26. Will there be a temperature impact due to the wastewater traveling 38 miles in an underground pipe?

The wastewater temperature in the pipeline would be expected to be similar to the ambient soil temperature. The pipeline would be buried at least 4½ feet deep, and the wastewater would be in the pipeline between 2 and 3 days. It's estimated the average temperature may be 45°F. The temperature of the Wisconsin River at Rhinelander varies through the year between the low 30's to around 80°F. When considering the effluent discharge would be less than 1% of the Wisconsin River flow, the temperature impact is insignificant. A temperature limit wouldn't be necessary in the permit.

27. The CMC literature lists the projected discharge water quality as 17 mg/L for nitrate as N when the Federal Drinking Water Standard is 10 mg/L and 740 mg/L for sulfate when the Federal Drinking Water Standards are 500 mg/L. How can CMC exceed these standards? Why is the Wisconsin River near Hat Rapids Dam classified as a "non-public water supply"? What is the effect of using these less stringent criteria at the discharge point on the waters down river that are classified "For Public Use"?

"Non-public water supply" refers to whether a body of water serves as a drinking water source, not whether the public accesses the body of water in other ways. As mentioned in response #13, the Wisconsin River is not a drinking water source and therefore the water quality standards are not reflective of drinking water criteria. It is classified under ch. NR 102, Wis. Adm. Code as a Warm Water Sport Fish Community, which requires protection of all "Fish and Aquatic Life". This does not mean that water quality criteria for the protection of human health would not be implemented. In waters that do not serve as drinking water sources, the "human health water quality criteria" account for recreational contact (ingestion of small amounts of water and skin contact), and exposure to a chemical through ingestion of fish which may have bioaccumulated a chemical. When the DNR considers discharges into rivers, the downstream uses and designations are always considered. For example, if CMC had chosen to discharge into Swamp Creek, a Fish and Aquatic Life stream, water quality limits would have been designed to meet standards downstream in the Wolf River, a river designated as an Outstanding Resource Water (the highest level of protection available).

Flow rate

28. The size (diameter) of the proposed pipeline will allow the transport and discharge of much more mine wastewater than the estimates DNR and the mining company are providing the public. Because more wastewater can be transported, a greater amount of toxic metals and other pollutants will be discharged into the Wisconsin River. Also, the estimated volume of wastewater that would be discharged has been reduced from an earlier estimate. Why is this, and how can we know what estimate is really correct?

We want to emphasize that the discharge volume of 600-1200 gallons per minute at this time is the best estimate available. It is possible the average and maximum discharge rates could change based on further calculations. The EIS will contain the final estimated amounts.

CMC has not yet decided upon the exact size of the pipe that would be used. This is because there are several types of metals and plastics that are being evaluated for use. Each type of pipe material produces a different amount of friction as fluids flow through them, and each can tolerate different working pressures. Pipes made from materials that produce greater friction (resistance to flow) and/or that can tolerate lower working pressures need to be larger than pipes with less friction and higher pressure ratings - in order to transport the same volume of fluid. As proposed, the maximum rate of flow that would be permitted to be discharged into the Wisconsin River would be 1200 gallons per minute, regardless of the choice and size of the pipeline material. The permit, if issued, will have pollutant mass and wastewater flow volume limits to regulate the amount of discharge. By imposing mass limitations that are constant, CMC would need to reduce the concentration levels in its discharge in order to comply with its discharge permit if the flow rates are greater than expected.

The 1986 Exxon Environmental Impact Statement indicated that the anticipated average discharge was 1180 gpm. The Department, in developing the 1986 draft discharge permit, considered flow rates as high as 3000 gpm in order to allow for the level of uncertainty that was considered to be in the groundwater flow modeling and resulting mine inflow that was predicted at that time.

CMC's estimated volume of wastewater has been reduced due to refinements to the groundwater model and better understanding of the hydrogeology at the site. The groundwater model continues to be evaluated by CMC's consultants and the Department. Checks of the model will verify its accuracy. When the modeling has been finished, we will have a range of projected effluent volumes. Our impact analysis will be conducted not only on the average flow but on the maximum flow as well in order to encompass the likely range of possible scenarios.

29. The flow rate numbers for the treated effluent discharge have been developed by CMC and have not yet been validated. Is this true?

This is correct. The final flow rates could change, thus these are preliminary. The final numbers will be in the EIS. There are three flow numbers that describe the effluent discharge through the pipeline: a maximum, average, and minimum. By using the known maximum capacity of the pumps, the maximum potential level of effluent flow is 1200 gallons per minute. It is more difficult to accurately confirm the influent wastewater flows. Like the mine drainage water the influent flows are based upon theoretical (modeled) conditions. To the extent possible, we plan on cross-checking pump rates, results from groundwater modeling, or other information available to confirm flows. The Wisconsin River flows are easily confirmed using data direct from the gauging stations on the Wisconsin River.

30. Will there be a maximum permitted flow rate for the effluent discharge? What will it be?

Yes, there would be a maximum flow rate in the discharge permit, but because we have not completed our verification of the company's mine inflow estimates, we cannot state with certainty what it would be. With the information we have now, the maximum rate would be 1200 gallons per minute. More importantly from a water quality protection standpoint, there would be a mass limit on the discharge to limit the total amounts of pollutants that could be discharged.

31. What will be the impact of this discharge during high water (flooding) conditions on the Wisconsin River?

This would not be a problem, because of the high Wisconsin River flows during floods. The discharge volume would be a very small fraction of the total flow in the river. The percentage of the river that would be attributable to the effluent becomes less as the river flow increases.

Effects on the Wolf River

32. This alternative means that impacts of the mine would cover two major waterways - both the Wolf and Wisconsin Rivers. Might living organisms be transported via the pipeline from one watershed to another, disrupting the natural balance in each watershed?

Since all discharged water other than intercepted groundwater would first go through the treatment process which would include a filter system, it is exceedingly unlikely that live organisms would be transported.

33. The diversion would harm the Wolf River Watershed - the reduced flow would warm the water to levels lethal to its trout population. Only a slight reduction in flow might have severe effects.

The effect on fisheries due to proposed mining activities is dependent on estimates of both surface and groundwater flow reductions, which will be determined by groundwater modeling. DNR staff have been thoroughly reviewing this model. The model is currently being updated and improved with some new groundwater flow data, so the results obtained thus far are not final. The response to this concern is based on the most current modeling results. (DNR groundwater specialists do not anticipate that the final flow predictions will differ from current predictions enough to change our forecast regarding the effects on the Wolf River.)

Water temperatures in the upper Wolf River (above the Hunting River) are heavily influenced by the water flowing in from Swamp Creek and Pickerel Creek, and the flow out of the Post Lakes. All of these currently are warm water fisheries (non-trout) where they enter the Wolf. Consequently, the Wolf River in this stretch is not currently a good trout water. From the confluence of the Hunting River downstream into Menominee County, the Wolf River does support good populations of trout.

Because the groundwater flow model is not yet complete, calculations to estimate temperature effects of flow reductions have not yet been made. The low flow of the Wolf at Swamp Creek is 24 cubic feet per second (cfs). Present estimates of mine dewatering is approximately equivalent to 0.9 cfs. Temperature impacts to the Wolf River by reduced flow to lower Swamp and Pickerel Creeks, which are already warm water streams, would be negligible.

If the proposed CMC mine would reduce direct groundwater inflow to the Wolf River in the trout water downstream of Hunting River, there could be negative impacts to trout. However, current modeling does not indicate that this would occur.

Interbasin water transfer

34. Permits are required for even minor water withdrawals from the Wolf River for the purpose of irrigation - how can this diversion take place without a permit?

The discharge is considered to be a groundwater withdrawal, not a surface water withdrawal. As a result, the withdrawal does not require a permit under Chapter 30.18 Wis. Stats. which is specific to surface water withdrawals.

For an interbasin diversion of water from the Great Lakes Basin into the Wisconsin River basin, an application and approval would be required, by state law, if the estimated amount of the average water loss is over 2,000,000 gallons per day. This requirement doesn't apply to CMC because the estimated amount of water loss from the Crandon mine would be approximately 886,000 gallons per day. Water loss means a loss of water from the basin from which the water is withdrawn as a result of an interbasin diversion or consumptive use or both. Of the total water loss, 664,000 gallons per day would be attributed to the average discharge rate of wastewater to the Wisconsin River. As described in ch. NR 142.03, Wis. Adm. Code, a withdrawal greater than 100,000 gallons per day must be registered with the Department and the volume of the water withdrawal and water loss must be reported. This is the only interbasin diversion requirement that applies to the Crandon Mine. This condition would

likely be inserted into CMC's Wisconsin Pollution Discharge Elimination System (WPDES) wastewater treatment permit.

35. Since this is an interbasin transfer of water, doesn't it fall under federal and even international jurisdiction?

See the previous response. Interbasin diversions are regulated under s. 144.026 of the Wisconsin Statutes and Chapter NR 142 of the Wisconsin Administrative Code, in response to the Great Lakes Charter. Under these provisions, diversions of greater than 5 million gallons per day out of a Great Lake basin requires an application and approval of the Great Lakes states and Canada. Since CMC proposes to divert 886,000 gallons per day, these approvals are not required by the Great Lakes Charter.

In 1986, Congress passed the Water Resources Development Act. This Act prohibits diversions of any amount of water from the Great Lakes without prior approval from the governors of all the eight Great Lakes states. However, each of the participating states has interpreted this law to apply only to surface water diversions.

36. The DNR should do a study to determine likely results of a continued large-scale interbasin transfer of water. What examples are there of interbasin water transfer, and what impacts have been observed?

The proposed diversion by is not by law considered "large scale". Because the estimated water loss is less than 2,000,000 gallons per day, s. 144.026, Wis. Stats., and ch. 142, Wis. Adm. Code, only require a reporting of the water loss to the Department. In reviewing the Crandon Mine proposal, work has been done to model (based upon field data and some computer modelling) the groundwater flows and determine likely paths of groundwater, and this information will be used to aid in the review of water balances. The Draft EIS will evaluate more fully the impacts of the diversion.

There are a number of instances where water is diverted from the groundwater of one basin to the surface water of another basin (many municipal treatment plants discharge treated wastewater that originated as groundwater from a different basin/watershed). One example of a large scale surface water-to-surface water transfer is that from the Great Lakes/St. Lawrence Basin to the Illinois/Mississippi Basin by the Chicago Sanitary and Ship Canal. Impacts of even such a truly large scale diversion have been difficult to quantify.

Cumulative impacts

37. What would be the impact to the river from future discharges if the Horseshoe Deposit or other deposits were to be mined?

The impact on water quality from developing this area of mineralization could not be assessed until a specific mining proposal were provided to DNR. A mining company would have to provide a wide range of information about the nature of the ore body, method of mining, composition of waste that would be produced, waste disposal methods, ore concentration techniques, and most importantly, the nature and efficiency of the wastewater treatment system to be used.

Regardless of these details, mine wastewater discharge could not be permitted if the contaminants in the discharge caused a decrease in water quality that would lower the water quality classification from its current level to a lower level. (As an additional note, the Horseshoe Deposit is not likely to be developed in the near future. It is not of a large enough size or a rich enough grade to be economical to mine at current or foreseeable world mineral prices.)

38. What if other deposits used CMC's wastewater treatment plant, increasing the total wastewater load and the time frame?

Any proposal to mine the Horseshoe Deposit, or any other projects, would require the same permit review and EIS processes that currently apply to the Crandon Project. Each such proposal would have to be evaluated based on the specific nature of the project, taking into account the cumulative impacts of all existing and proposed discharges.

Liability

39. If CMC goes out of business or is purchased by another company, is Exxon still held responsible for the site?

Should CMC go out of business, the parent companies, Exxon and Rio Algom, would become responsible for the site. In addition, the bonds and other financial sureties held by the state are independent of the company, in that they are available to the state regardless of the solvency of the mining company. In the case of the sale of the mining operation, the new owner assumes all responsibility for operation and reclamation of the site and must post replacement bonds with the state prior to release of the original permittee. However, the original operator could still be held liable for costs related to environmental contamination which occurs as a result of their actions. In regard to the long term, an owner's responsibility for management of a mining waste site never terminates.

40. What will happen if CMC is found in violation of the standards? How can we trust that the limits that would be imposed on wastewater discharge volumes and contaminant concentrations will be met? The mine should be closed immediately if wastewater discharge standards are not met. Each violation should result in a \$100,000 - \$100,000,000 fine.

As part of the wastewater discharge permit, the department would specify extensive monitoring requirements to be conducted by the operator. CMC would be required to monitor the volume of discharge water and also the quality of the water and provide these results to the department. CMC has proposed to check effluent quality in the discharge holding basins before discharging to verify permit limits are met. If limits aren't met, the wastewater could be recycled back to the mine, mill, or tailings pond. This would be an ideal situation which would prevent any violations of water quality criteria in the Wisconsin River.

In the event a discharge violates an effluent limit, the degree and frequency of the violation would be evaluated to determine what DNR action is appropriate. Ranges of action include a notice of violation, an enforcement conference to discuss what action is necessary to prevent future violations, the issuance of an order with a compliance schedule to achieve compliance, and referral to the Attorney General's Office for prosecution if violations persist. Fines, forfeitures, and other enforcement remedies appear in ch. 147, Wis. Stats., which regulates all wastewater discharges.

This system of self-monitoring is the same procedure followed by all other wastewater dischargers in the state. As a check on the company's monitoring, the department also would conduct compliance surveys during which "split" samples are collected by department staff and analyzed by the state laboratory for comparison. The experience of the DNR has been that false reports of discharges are very rare, and that the penalties for falsifying reports are serious.

Persons convicted of a wastewater discharge violation can be fined up to \$5000 per day of a continuing violation. Criminal charges can also be made for certain acts such as fraudulent reporting. The Department has the authority to order immediate closure of a facility in the event of an environmental emergency or threat to public health or safety. In addition, failure to comply with an order of the Department can result in permit revocation and civil penalties.

41. The DNR should require that an insurance policy be obtained by the operator to guarantee availability of funds to pay fines imposed by the DNR. How much liability insurance is currently carried by CMC?

Similar to environmental regulation practices in other states, the Wisconsin Legislature has not provided the DNR with authority to impose insurance requirements for the purpose of paying potential future fines. Hence, any such fines would have to be paid out of the company's assets.

Under s. 144.86 of the Wisconsin State Statutes, a series of events occur after a mining permit has been approved. In this case, if a permit were issued, CMC would have to then furnish a bond and submit a certificate of insurance. This insurance coverage would be an amount determined by the DNR, but not less than \$50,000. The amount required to ensure adequate liability coverage would be determined via consultation with state risk management experts and with other appropriate state officials. This determination would not be made until after the permits were

issued. While \$50,000 is the minimum provided for by the Legislature, the Department believes such a small amount would apply to the very smallest of mines, not an operation of the size of CMC's proposal.

42. Can any amount of insurance replace the quality of the Wisconsin and Wolf Rivers?

Mining legislation and other environmental protection laws are intended to prevent serious water quality deterioration in the state's waterways. If rivers in this state were threatened with loss of quality by any proposed activity that DNR regulates, that activity could in most cases not be permitted. DNR staff are fully aware that it is essential to protect water quality to the extent permitted by state law. We realize that with this proposed mine there exists the potential for serious long-term harm to water quality. That is why we are being extremely rigorous and cautious in our review. DNR staff have made many requests for new information from CMC, and have suggested or required numerous changes to the mining project design and operation through this stage in our review of the project.

43. The Net Proceeds Tax on mining means that CMC will only compensate affected communities when it is making a profit. If problems develop with the pipeline, there may not be money to pay for environmental repairs or victim compensation.

See response #3. The first sentence of this statement is true. Annual payments to the affected municipalities by the Mining Investment & Local Impact Fund Board are based on the net proceeds tax payments by the operator. There may be times over the life of the mining project when the company does not make a profit or does not show enough of a profit to generate tax payments sufficient to cover these annual payments. Discretionary grants from the Mining Investment and Local Impact Fund Board could be available for impacted communities. In addition, the local agreement process provides a mechanism whereby municipalities can negotiate with the company so that minimum payments are guaranteed every year regardless of the company's profitability. This was implemented in the local agreements with the Flambeau Mining Company.

The responsibility of the company to comply with all applicable permits and laws and to take necessary corrective actions should some unforeseen event take place is independent of their degree of profit. To further ensure the availability of necessary funds for critical aspects of the project in case the company does default on its responsibility, the state requires posting of third party forms of financial surety, such as performance bonds, certificates of deposits or letters of credit.

44. CMC has said that it is up to the DNR whether the Wisconsin River is part of the mine site and that CMC would not be responsible for cleanup and maintenance of properties not on the mine site. Is this true, and if it is, is the DNR considering naming the Wisconsin River as part of the site?

The Wisconsin River would not be considered part of the mining site. The pipeline and associated facilities would be regulated as part of the mining site, and as such the construction, operation, and reclamation of the pipeline would be regulated under the mining permit and other applicable department permits. Should the discharge cause environmental damage, the DNR retains the authority to require CMC to take remedial actions, impose penalties and fines on the company and seek additional compensation from the company for damages to the environment.

Monitoring

45. Lake Alice should be monitored on an annual basis for heavy metal accumulations.

It is possible that Lake Alice, along with other segments and impoundments of the river would be monitored for concentration trends in the surface water and sediment, if the proposed discharge were approved. As mentioned in response #8, some data exists and other monitoring is planned. Refer to responses #6, #8, #9 and #21 regarding sediments and impoundments for more discussion.

46. Who would pay for all the monitoring? Who will pay for cleanup if the pipe is ruptured due to frost or construction work? After the 40 year monitoring period, who is responsible for paying for any cleanup and who will be responsible for problems associated with the abandoned pipeline?

CMC is responsible for all costs of their monitoring program. Department costs associated with surveillance of the operation would be paid for out of the DNR's budget, identical to the procedures for all other public and private dischargers in the state.

CMC would be responsible for repairing any damage to the pipeline and for any other necessary remedial actions associated with such damage. Should a third party actually cause the damage through some unauthorized or unintentional action, the mining company could seek compensation from that party for its damages.

Under the mining long term liability law administered by the Department of Industry Labor & Human Relations, a mining company retains perpetual liability for any injury or property damage which occurs as a result of the operation. Therefore, if the pipeline were to collapse and cause problems some time in the distant future, CMC and its parent or successor companies would be liable for the damages.

47. Is there continuing monitoring of the effects of the discharge on wildlife? The DNR should show documented (not computer generated) evidence that the heavy metals will not cause problems for fishing and waterfowl now or in years to come.

The proposed effluent must meet all applicable water quality standards, which include those designed to protect wildlife. The wildlife community will receive the same protection as the aquatic life community and the human population will receive through the implementation of our current water quality standards. In addressing the question regarding evidence that heavy metals will not cause problems for fish and other aquatic life, the bioaccumulation of pollutants through the food chain is a major component of the water quality criteria for the protection of humans and wildlife. The extent to which pollutants bioaccumulate is reflected in the water quality criteria. The amount of fish that humans and top predator organisms (e.g. eagles) consume is meant to account for exposure to a chemical by ingesting fish which contain a pollutant. It should also be noted that the water quality criteria for the protection of wildlife are based, in part, on the toxicity of a given pollutant to waterfowl. The long-term fate of any pollutant and the potential for adverse effects to occur after a number of years is a very legitimate concern and one that we do our best to assess.

48. Will flow monitoring be a requirement in the wastewater treatment permit? Who will monitor for leakage during the operations period? How/who will determine if values vary enough along the pipeline to determine if there is a leak? How will the leak be found along the 38-mile pipeline, especially if it is in sandy soils or wetlands? Would there be any allowable leakages from the pipe before the system would have to be shut down?

The wastewater treatment permit would require effluent flow monitoring, which would occur at 3 locations - at the discharge from the treatment plant, at the booster pump station around the half way point near Monico, and at the point of discharge into the Hat Rapids Dam. The pipeline would be equipped with continuous flow monitoring devices. Should drops in operating pressure and leaks be detected, the company would be required to stop pumping and repair the problem. A telemetry system would send data to the plant control room for continuous monitoring. Flow values at these locations would be compared to one another in order to monitor for leaks.

Contingency plans

49. If there are leaks or permit violations of effluent limits, will the wastewater treatment facility have the capacity to handle the storage of untreated wastewater? What if there is excess water?

There would be some storage capacity in the wastewater treatment system provided by the 2 influent storage basins and 2 discharge holding basins. Each of these basins would have a capacity of 1.73 million gallons, which together would provide a capacity of 4 days of wastewater at the maximum flow of 1200 gallons per minute. If these basins were full and a discharge wasn't allowed because effluent limits weren't met, or if the pipeline is broken and can't be used, excess water could go to the tailings pond.

50. How will the proposed pipeline be kept from freezing so that serious leaks will not develop due to severe cold temperatures in winter?

The pipeline would be buried at least 4½ feet, and under roadways and driveways it would be 7 to 8 feet deep. This would provide separation from the frost. The water is also unlikely to freeze because it would be flowing. Pipeline road crossings and outstanding water resource stream crossings would be constructed so the pipeline is installed inside a steel casing to provide further protection from breakage and leaks.

Noise and air pollution

51. What about noise associated with pipeline pump stations, air vents, and booster stations? How will they be sited in relation to private residences?

The DNR does not regulate noise or noise pollution. Noise outside factories and other businesses is generally only regulated by local governments. The one booster pump station proposed along the 38 mile route of the effluent pipeline would be located using criteria similar to that used for sewage collection system pumping stations. Currently, this one station is proposed to be located somewhere near Monico, but no specific site has yet been proposed. It would be installed below the surrounding land surface and be accessible through a manhole. The pump would be electric powered and emit a low humming sound that should be audible only in immediate proximity to the pump.

The two main pumps would be located on the plant site and should be no louder than a common municipal sewage treatment plant pump.

52. Is there an air quality concern with these booster stations?

Because the pump motors are electrically powered, they would emit no air pollutants of concern. The air vents would be similar to those located along natural gas pipeline corridors. They would allow air carried along by the treated wastewater to escape from the pipeline, where the line crosses high points along the route. This vented air would not cause any air quality problem.

Pipeline removal

53. CMC should be required to remove pipelines on private property upon completion of the project. There could be problems with scale and residue and potential future groundwater contamination from this residue when the residue finds its way out of the pipe. Also, there may be future physical problems with pipe failure under driveways.

Accumulation of residue inside the pipeline is unlikely. Suspended solids and substances which precipitate out would be removed by the wastewater treatment system. In addition, the pipeline would be designed and operated so the wastewater has a self cleaning flow velocity to prevent the accumulation of materials inside the pipeline. There could be potential future problems with the empty pipeline, such as subsidence of the soil above it if the pipe walls collapse, but this is also unlikely.

The final disposal of the pipeline upon project closure has not yet been determined. We will evaluate the need for removal of the pipeline (which would disturb the entire right-of-way again), along with other alternative abandonment practices, including filling the pipeline or simply leaving the drained pipeline in place.

Cost of the permitting process

54. How much has CMC paid for the permitting process? How much of this are the taxpayers paying for?

The public is not paying for the permitting process. CMC has paid a \$10,000 permit fee with submittal of the mining permit application and other fees required by other permit applications. In addition, CMC must pay the cost of all permit evaluations, reviews, and the preparation of the EIS (regardless of whether the project is ultimately approved or not). The DNR bills the company for these costs in two different ways. Quarterly, CMC is billed for the environmental impact statement and consultant costs. To date CMC has paid more than \$188,000 for these costs. Following completion of the permit review process, CMC will be billed for all permit-related costs less any fees paid at the time of submittal. Through the end of 1995 the accumulated permitting costs were about \$322,000.

Property values

55. What will this discharge do to property values?

Prior to approving the permit application, the Department would set effluent limits that the company would have to meet. In addition, the plans for the wastewater treatment plant would have to be approved by Department engineers to make certain it could treat wastewater to the required level. Effluent limits are set based on some very conservative dilution assumptions designed to protect the existing fish and aquatic life and the current uses in the Wisconsin River. Effluent limits also take into consideration the potential problems that toxic substances might cause in higher concentrations, the potential concentration and accumulation of toxic substances in fish, wildlife consumption and human health concerns. As a result, the discharged water would contain only minute amounts of heavy metals, for example. The goal of setting effluent limits is to maintain the levels of potentially toxic substances well below the threshold level where they are problematic for humans and aquatic life.

As a result of the limitations on the proposed discharge, there should be no noticeable changes in the flow or quality of the river water below the discharge site. The average discharge quantity added to the average flow in the river would be too small to measure downstream in the river. Limits on suspended sediment amounts would effectively minimize silt and clay deposition to minute amounts below existing river bed loads. Additionally, there already are two permitted dischargers immediately upstream at Rhinelander; the DNR is not aware of any reductions in property values due to those two discharges. For all of these reasons, if the permits are approved river frontage downstream from the Hat Rapids Dam should be as desirable after the discharge as before, and there should be no change in property values.

Tourism & Recreation

56. This discharge will be detrimental to tourism in the area. Is the effect of this project on tourism considered in the permitting process?

Potential impacts on tourism will be considered in the project's Environmental Impact Statement, the draft of which is due to be released late this year or early next year.

57. The reduced flow in the Wolf River may also negatively affect recreation.

Approximately 600 gallons of groundwater per minute is expected to be lost from the Wolf River drainage. Therefore, we must assume that this entire 600 gallons per minute of groundwater flow would be lost from the Wolf River basin due to the wastewater discharge, increased evaporation, and other reasons. This reduction in flow would equal only about five percent of the ten year low-flow ($Q_{7,10}$) in the river. The percentage of the reduction of flow for the average or peak river flow would be significantly less than five percent. This drop in flow would not be sufficient to have any impact on the fishery, nor on canoeing, rafting, scenic enjoyment, or other recreational pursuits further downstream.

Drawdown from manmade lakes

58. Is it possible that the Nokomis, Rainbow, Willow, Jersey and Spirit reservoirs could experience additional drawdown to flush additional contaminants and BODs resulting from this project, as has happened for the paper mills?

No. These reservoirs (and all others on the Wisconsin River) are not operated to flush waste from the river. The Wisconsin Valley Improvement Company (WVIC) operates the upper river reservoirs as storage reservoirs to the Wisconsin River. Their goal is to reduce flood peaks and increase summer dry period flows to maximize the power generation at the generator dams along the main stem of the river.

The effect of this operation does benefit the waste assimilation of the river by providing more summer flow during periods that would normally experience lower flows without the reservoirs. Except in rare conditions (once per ten years), WVIC does not alter operation for waste assimilation for the present dischargers, nor would they alter

operation for an additional discharger. WVIC does attempt to maintain a minimum flow during rare extreme droughts that would benefit both waste assimilation and power generation at the same time. In addition, the discharge permit would not be directly related to the average flow of the Wisconsin River. There would be one set of limits which would be based upon the historic low-flow of the river, and those limits would have to be complied with for the life of the permit, regardless of whether dam operation increases the dry-weather flow of the river.

Choice of discharge location

59. Has the DNR considered requiring full treatment of mine wastewater as an alternative to permitting the proposed discharge to the Wisconsin River? Why can't they keep the treated water where it is and discharge it there? If the technology is available to treat the wastewater to Wolf River standards, why can't they do that and discharge into Swamp Creek? And why is CMC paying to pipe it to Hat Rapids instead of discharging at Rhinelander?

The DNR can't specify to any discharger the location of a proposed discharge, but instead reacts to whether the location selected by the permit applicant is acceptable based on state statutes and administrative codes, and if the proposed level of treatment would meet the effluent limits. The Department has no authority to require a discharger to meet limits more conservative than those required. The level of required wastewater treatment is dependent upon the use classification of the receiving water. The Wolf River is an Outstanding Resource Water (the highest water quality classification), so any discharges to it must be of higher quality than a discharge to the Wisconsin River. This is because the Wisconsin River is of a lower use classification (a warm water sport fish water). If CMC proposed a discharge to the Wolf River system, it would require a very expensive and sophisticated treatment system. Such a system would be costly to operate, consume a lot of energy, require complex monitoring, and would be less reliable than the most conventional treatment systems. Based on these criteria, and following its analysis of alternative discharge methods and sites, the company chose the Wisconsin River as its proposed discharge. The Hat Rapids dam site avoids residential and commercial development in Rhinelander and offers a mechanism to allow for rapid mixing of the treated wastewater and river water.

60. The discharge into the Wisconsin River is as much of a concern to the Sokaogon Chippewa Community as was the proposed discharge to Swamp Creek due to the presence of wild rice beds in Lake Alice.

Wild rice populations in lakes and streams naturally fluctuate between good and bad years. Wild rice can be harmed by high water occurring between mid May and early June, when plants are young and susceptible. The proposed wastewater discharge would be such a small percentage of the total high water flow that it could not be measured and would have no measurable effect on the rice beds downstream from Hat Rapids dam.

The potential effect on the rice beds of pollutants in the discharge cannot be fully evaluated until the wastewater characterization study is complete. Any potential impacts will be described in the EIS that DNR is developing. Estimates of the water quality and character of the proposed Crandon Mine wastewater discharge, if proved accurate, indicate any resulting changes in the quality of the Wisconsin River would be quite small. This would minimize the chance that wild rice could be affected by the mine effluent. The DNR is aware of a current study being conducted by the Great Lakes Indian Fish and Wildlife Commission (GLIFWC) on the effects of metals in water on wild rice, but this study has not yet been released.

River allocation of discharged metals

61. It is unfair that communities such as Tomahawk are being required to install expensive improvements to their wastewater treatment plants to reduce the concentrations of pollutants released, while at the same time allowing an additional discharge into the river which would contain more of these chemicals.

The wastewater from a municipal discharger like the City of Tomahawk and the proposed industrial discharge from the mine would be very different in nature. Municipal wastes are dominated by organic materials from households, while the proposed mine discharge would contain mostly inorganic substances like metals, and high concentrations of sulfates. (Sulfates are only regulated in groundwater and drinking water sources, not in surface waters.)

However, the discharge requirements for CMC would be to the same water quality standards as the other dischargers, and may not be any less stringent than the municipalities.

The only limitations in Tomahawk's current discharge permit are for BOD, suspended solids, Ph, and chlorine. Of those, only the chlorine limit is water-quality based. The permit currently has no requirements related to the discharge of metals.

62. Leachate from local landfills is already being transported to an industrial treatment plant and to a distant municipal plant. Doesn't this imply that local treatment plants are at capacity and do not have the ability to treat any more waste? And does this not also mean that the Wisconsin River is at capacity in terms of the additional contaminants it can accept?

First, no local plant would be receiving or treating any mine wastewater. CMC proposes to build its own plant at the mine site. Second, treating leachate as you describe is generally done if another plant operates in a way that better treats effluent to remove dangerous pollutants, or if another plant has excess capacity, which can make it cheaper to truck effluent for treatment, as opposed to expanding or modifying the existing plant. It can also avoid damage to the local treatment plant, if waste has compounds in it that harm the bacteria or other components that treat waste in an ordinary municipal system. Finally, many systems cannot treat landfill leachate sufficiently to remove enough contaminants to meet discharge standards, so using a specialized industrial or other treatment plant is a better way to protect the quality of the Wisconsin River.

The fact that some leachate from landfills is being treated at facilities other than local treatment plants does not infer or support a conclusion that the Wisconsin River is at capacity for some substances. This may be done for the reasons stated above. Based on preliminary effluent limits, which take into consideration current Wisconsin River background water quality, the Crandon Mine discharge would be in compliance, so there is capacity for the discharge.

Foreign ownership of mining company

63. How can our state permit a foreign industry to put more financial burden on our citizens and more strain on our river?

Although one of CMC's parent companies, Rio Algom, is registered in Canada, the Crandon Mining Company itself is a Wisconsin general partnership - not a foreign industry. In addition, the law in Wisconsin does not require mining permit applicants to be organized in this state or in this country, nor does it exclude those companies with multi-national operations. The mining laws and other environmental protection requirements that apply to mining proposals help ensure that a mining project does not result in a financial burden to the state.

Mining is a legal activity in this state provided that it is done within the limits imposed by various applicable environmental protection laws and rules. An applicant is free to propose a mining project and the state is obligated to review that proposal. This review, however, is not done at state expense (see response #54). Also, the DNR will not approve the project if unacceptable impacts to the environment would occur.

DNR's role and responsibilities

64. The DNR has a trust responsibility to protect our resources for future generations - how could the DNR permit this mine and wastewater discharge pipeline?

The trust responsibility regarding the public waters of Wisconsin is upheld by DNR's implementation of natural resources laws enacted by the legislature, and the administrative codes that pertain to these laws. These laws embody public demands regarding resource protection, to the extent that the collective actions of legislators reflect the wishes of their constituents. Current state law permits a large number of wastewater discharges to public lakes and streams.

A primary tool the DNR uses to protect Wisconsin's water resources is the set of water quality standards in the Administrative Codes. Wastewater such as that from a mine cannot be discharged without a Wisconsin Pollution Discharge Elimination System permit. Permits under this system are written and enforced to assure that water quality standards are maintained and our water resources are protected. The means used to determine what types and concentrations of wastes can be discharged into state waters is discussed in response #20 of this comment/response summary.

65. The additional study necessitated by the change in discharge location from Swamp Creek to the Wisconsin River requires that DNR halt work on drafting the Crandon Mine EIS.

This change in the mining plan does require additional study and analysis, but it does not justify that DNR halt work on the EIS draft. Many areas of study and analysis are ongoing while DNR staff simultaneously work on drafting sections of the EIS for which we do have adequate information.

66. Why does the DNR seem to be defending CMC?

The state legislature established the existing mining laws that provide the framework for mining regulation in the state. Under current law, CMC is entitled to attempt to demonstrate that it can meet the environmental protection and other requirements of the mining laws. DNR is responsible for implementing the mining laws. This responsibility includes reviewing the mining proposal and judging whether the project can meet the environmental protection requirements of the law.

The Department does not defend the proposals of Crandon Mining Company (nor any other company, agency, citizen's group, etc.), but we are legally obligated to make sure that everyone in the state is treated equitably under the law, regardless of public opinion for or against a specific project.

At times, it is useful to present information by comparing the impact of a proposed project, such as a mine, to the impact of other permitted activities that have long been ongoing and seem to have general public acceptance. This can help concerned citizens judge whether certain aspects of a project really merit their continued concern. At times, some of these comparisons may show that certain aspects of a project pose even less of a health or other environmental threat than do long-established practices such as disposing of treated municipal or manufacturing industry sewage. The intent of these comparisons is to help people focus on those aspects of a project that pose comparatively greater threats, not to defend the project as a whole.

67. Why does the DNR support the state's mining laws?

The mining laws and other natural resource protection laws that apply to mining projects are the result of the legislative process. The DNR is the state agency responsible for implementing these laws. In this position, the agency has no official "position" on or support for mining, as it is not the DNR's role to promote mining or discourage mining. If an applicant can show compliance with all of the environmental protection requirements, criteria, and standards, DNR must grant the necessary permits and approvals.

Frequently DNR staff or administrators are invited to testify at legislative hearings on proposed mining legislation or asked by legislators about particular aspects of the mining law. DNR has supported numerous bills to strengthen the mining law in the past several years. Most recently, a bill concerning proof of financial responsibility required for mining companies was signed into law.

68. Why is the DNR appealing the ruling which would allow them to ban sulfide mining?

The State appealed the Rusk County Circuit Court decision because it is felt that the statutes clearly do not authorize the imposition of a ban on sulfide mining. The legislature created an approval/denial process under which each mining project is evaluated on its own merits regardless of the type of ore body involved. The appeal also was the fastest way to resolve the question, for had the DNR implemented a ban on sulfide mining, it would have been sued by the mining industry. The appeals court decision released in June overturned the Circuit Court decision.

69. Would the DNR make sure that a complete copy of the EIR and EIS is sent to the Tomahawk Library?

Following the May 20 public meeting, Department staff contacted the person making the request. Previously, three volumes of CMC's EIR had been sent to this person. Subsequently, Volumes 1 & 2 of the EIR, the TMA Feasibility Report and Addenda, and the Mine Permit Application were mailed. The person receiving the documents will place them in the Tomahawk Public Library.

70. A Federal Energy Regulatory Commission (FERC) permit is required before setting standards for any discharge.

The Clean Water Act regulates discharges into surface waters. This authority has been delegated in the State of Wisconsin to the DNR. FERC does not have control over discharges into turbines, as this is a water quality issue covered by the Clean Water Act. However, FERC does regulate the structures and operations of hydropower dams on navigable water. In the unlikely event that FERC would consider the structural change to the dam (adding a discharge structure) significant, they might want to review the structural specifications. That would have to be resolved between the dam owner and FERC. However, all aspects of discharges to surface waters are regulated by the state.

Public involvement

71. The Wisconsin Environmental Policy Act (WEPA) requires that DNR hold a formal "scope of study" hearing on the change in discharge sites (from Swamp Creek to the Wisconsin River).

WEPA (Section 1.11, Wis. Stats.) does not require that a scoping hearing be held. The state mining laws require that DNR provide public notice that a mine permit application has been received, and that public comments be collected for 45 days after that notice, but again, no public scoping hearing is required by the mining law.

The hearing the Department holds after receipt of mine permit applications (and held after we received the Crandon Mine permit application) is required by a Department-adopted administrative rule. It is intended as a means for the public to participate in a forum at the very beginning of the mine permit review process.

Any complex project, not only mining proposals, is likely to involve modifications as review of an application proceeds. When modifications occur, the Department recognizes that it is necessary to obtain pertinent additional information. We have been requesting and obtaining this additional information from CMC. We also have been compiling information to address the public concerns regarding the Wisconsin River discharge, as this public comment summary reflects.

72. Why did the DNR wait so long to grant this public meeting?

For other similar permit review processes, it is typical to accept public comment following issuance of the Draft Environmental Impact Statement. It is not typical to hold public meetings during the time of information gathering. However, an exception was made for the Crandon meeting due to evidence of substantial public interest. Further, a December 14, 1995 letter from a board member of Environmentally Concerned Citizens of Lakeland Areas (ECCOLA) requested a spring meeting, in April or May, 1996. The meeting was held May 20.

73. Why can't Lincoln County, etc. enter into local agreements with CMC? Forest County is allowed to make a decision which will affect Lincoln County, and Lincoln County has no choice in the matter.

Section 144.839, Wis. Stats., authorizes local units of government which have zoning or land use control over any aspect of a proposed mining project, and other municipalities within which any part of the mining site is located, to negotiate local agreements. Lincoln County does not meet either of these two criteria.

74. At the hearing and through the mail, the DNR was presented with petitions containing approximately 1675 signatures opposing the discharge to the Wisconsin River. The Petenwell-Castle Rock Property Owners Association, Inc., the Citizens for a Healthy Environment and Economy in the Rhinelander area (CHEER), the

Dellwood Snowmobile Club of Adams County, and the Town of Skanawan in Lincoln County each submitted resolutions opposed to discharge to the Wisconsin River. How many individuals need to be opposed to the pipeline for the DNR to deny the permit? Is there a number or percentage of the population opposed that could be met that would affect the decision?

These petitions and resolutions underscore the fact that there is a lot of public concern over the CMC project. This public concern serves to bolster DNR's position that our current, extremely rigorous review of this proposal is warranted. By law, a regulatory decision to issue a treated mine wastewater discharge permit is to be made on the basis of a technical, scientific review of the project and its impacts. The decision is not subject to a public vote. The role of voting is in electing local and state representatives to represent the public will in developing natural resource legislation and policy.

75. The DNR should hold hearings at all large lakes and cities over 2,000 people from the point of discharge downstream to Prairie du Chien because the mining project would affect the Wisconsin River all the way to the Mississippi River.

As explained in our responses, the effluent limits that would be imposed upon CMC's proposed discharge are designed specifically to protect the aquatic resources and downstream uses of the river. If the discharge were permitted, downstream river communities and those who used the river for recreational purposes would not be able to observe any differences in flow or water quality. At the Petenwell and Castle Rock flowages, located approximately 130 and 150 river miles south of the proposed discharge, it would be impossible to measure any water quality changes resulting from the project using the most advanced scientific measuring techniques available to us today. For this reason, there is no need for public hearings as requested, and public comments on the discharge should be made after reviewing the draft environmental impact statement (DEIS) on the proposal.

76. Are the comments from public hearings really used by the DNR?

Public comments are solicited, welcomed, and used by DNR staff in evaluating mining proposals. Public comments are relied upon to help determine the full range of issues and potential impacts posed by a mining project. However, public comments are not used like ballots, and cannot be substituted for the legally-prescribed process of scientifically evaluating a project in light of legislatively established criteria for making decisions.

77. When is the next opportunity to offer comments to the DNR on this project? Please inform us of future hearings and meetings with CMC so we can attend.

The next public hearing, an opportunity for direct public involvement, will be held following the release of the draft environmental impact statement (DEIS). A public hearing must be held no sooner than 30 days and no later than 60 days after release of the DEIS. The DEIS is expected to be released during the latter months of 1996 or early 1997. At any time, however, comments and questions may be sent to the DNR project manager:

Bill Tans (ISS/6)
P.O. Box 7921
Madison, WI 53707

Technical meetings are held on a regular basis with CMC. The meetings are set up to allow exchange of ideas and information between the Company and its consultants and the Department and its consultants. In addition, representatives from the U.S. Army Corps of Engineers, the U.S. Environmental Protection Agency, other relevant federal and state agencies, and potentially affected tribal and local governments may participate. Technical meetings are not designed to receive input or comments from the general public.

Although we will not be entertaining public questions or comments at these technical meetings, everyone is welcome to attend technical meetings as observers. If you wish to obtain copies of our file materials or you have questions regarding the technical meetings, please contact the Department in Rhinelander or Madison.

With increasing public interest in the proposed Crandon Mine, many people have requested to be notified of all future meetings between the Department and the Company. Although we are unable to notify each of you on an individual basis of upcoming meetings, we have established a *dedicated phone line* (608-267-7534) that will have an up-to-date recorded announcement of scheduled meetings. The recorded message lists the time, place, and topic of meetings scheduled with sufficient lead time to be on the recording. The announcement will not include field verification activities of Department staff.

MEETING SCHEDULE

DATE

10/2
10/3
10/4
10/5
10/6
10/7
10/8

Meeting with the Board
Meeting with the Board
Meeting with the Board
Meeting with the Board
Meeting with the Board
Meeting with the Board
Meeting with the Board

MEETING SCHEDULE

DATE

10/9
10/10
10/11
10/12
10/13

Meeting with the Board
Meeting with the Board
Meeting with the Board
Meeting with the Board
Meeting with the Board

MEETING SCHEDULE

DATE

10/14
10/15
10/16
10/17
10/18

Meeting with the Board
Meeting with the Board
Meeting with the Board
Meeting with the Board
Meeting with the Board

Appendix A

COMPARISONS OF SELECTED EFFLUENT CHARACTERISTICS FROM SOURCES NEAR THE PROPOSED DISCHARGE AND THE FLAMBEAU MINE

Effluent Volume

<u>Discharger</u>	<u>Million Gal/Day</u>
Crandon Mine (proposed)	0.664
Flambeau Mine	0.466
Tenneco Packaging	5.026
Rhineland Paper	9.162
American Tissue	0.096
City of Rhineland	1.333
City of Tomahawk	0.480

The flows represent average values of effluent discharged from the wastewater treatment system. The Crandon Mine flow is estimated based on groundwater modelling and geological site investigations.

COPPER Effluent Quality

<u>Discharger</u>	<u>µg/L</u>	<u>Lbs/Day</u>
Crandon Mine (proposed)	5.7	0.03
Flambeau Mine	11.5	0.04
Tenneco Packaging	56	2.35
Rhineland Paper	9.7	0.74
American Tissue	2.9	0.0023
City of Rhineland	14.6	0.16
City of Tomahawk	47.4	0.19

Background = 0.33 µg/L (micrograms per liter)
Wisconsin River at Hat Rapids Dam

LEAD Effluent Quality

<u>Discharger</u>	<u>µg/L</u>	<u>Lbs/Day</u>
Crandon Mine (proposed)	0.016	0.00009
Flambeau Mine	0.317	0.0012
Tenneco Packaging	9.3	0.39
Rhineland Paper	<4	<0.30
American Tissue	<2	<0.0016
City of Rhineland	6.5	0.072
City of Tomahawk	-	-

Background = 0.162 µg/L (micrograms per liter)
Wisconsin River at Hat Rapids Dam

ZINC Effluent Quality

<u>Discharger</u>	<u>µg/L</u>	<u>Lbs/Day</u>
Crandon Mine (proposed)	2.9	0.016
Flambeau Mine	38	0.15
Tenneco Packaging	420	17.6
Rhineland Paper	<3	<0.23
American Tissue	25	0.020
City of Rhineland	54	0.60
City of Tomahawk	46	0.18

Background = 1.2 µg/L (micrograms per liter)
Wisconsin River at Hat Rapids Dam

BOD Effluent Quality

<u>Discharger</u>	<u>mg/L</u>	<u>Lbs/Day</u>
Crandon Mine (proposed) ¹	5	28
Flambeau Mine ²	N/A	N/A
Tenneco Packaging	69	2,912
Rhineland Paper	18	1,396
American Tissue	460	370
City of Rhineland	16	178
City of Tomahawk	15	60

Background = <3 mg/L (milligrams per liter)
Wisconsin River at Hat Rapids Dam

¹ Estimated

² The Flambeau Mine does not require a BOD limit in its permit, so no data is available.

PILOT STUDY DATA

The Crandon Mining Company conducted treatability studies to evaluate treatment processes and optimum treatment conditions. Synthetic wastewater was generated from actual rock, ore, and groundwater from the mine site. This wastewater was treated in bench scale (large beakers as treatment vessels) pilot tests at the Foth & Van Dyke laboratory where the effectiveness of various treatment processes were evaluated. The effluent was analyzed to characterize the expected discharge quality. Bench scale tests can accurately simulate full scale processes. The following effluent sample from the bench scale treatability pilot study was collected on April 26, 1995. (DNR split sample analysis done by the State Lab of Hygiene.)

<u>PARAMETER</u>	<u>CONCENTRATION</u>
Total Solids	1,430 mg/L
COD*	17 mg/L
Hardness	830 mg/L
Alkalinity	14 mg/L
pH	7.14 su
Conductivity	1600 µmhos/cm
Ammonia N	0.804 mg/L
Nitrate N	0.217 mg/L
Total Kjeldahl N	1.0 mg/L
Chloride	41 mg/L
Fluoride	0.21 mg/L
Phosphorus	0.026 mg/L
Boron	0.046 mg/L
Cyanide	<0.01 mg/L
Aluminum	61.7 µg/L
Antimony	<2 µg/L
Arsenic	0.3 µg/L
Barium	150 µg/L
Beryllium	0.005 µg/L
Cadmium	0.03 µg/L
Calcium	190 mg/L
Chromium	0.38 µg/L
Copper	5.7 µg/L
Iron	50 µg/L
Lead	0.016 µg/L
Magnesium	87 mg/L
Manganese	4.7 µg/L
Mercury	40 ng/L
Molybdenum	4 µg/L
Nickel	4.9 µg/L
Potassium	14 mg/L
Selenium	110 µg/L
Silver	0.024 µg/L
Sodium	51 mg/L
Sulfate	900 mg/L
Thallium	<1 µg/L
Zinc	2.9 µg/L

* COD stands for chemical oxygen demand. COD will always be a larger number than BOD (biochemical oxygen demand). No results were obtained from the BOD analysis due to problems in running the test.

Public Concerns Regarding the Proposed Crandon Mine

A Summary of Public Comments and Questions from the April 9, 1997 Public Meeting at New London, Wisconsin, with DNR Responses

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

May 19, 1997

LIST OF ACRONYMS AND ABBREVIATIONS
ASSOCIATED WITH THE CRANDON PROJECT

BOD:	Biochemical Oxygen Demand
CMC:	Crandon Mining Company
COD:	Chemical Oxygen Demand
CTH:	County Trunk Highway
DEIS:	Draft Environmental Impact Statement
DNR:	Department of Natural Resources
EIS:	Environmental Impact Statement
GCL:	Geosynthetic Clay Liner
Mg/L:	milligrams per liter (1 milligram = 1/1000 gram), 1 gram = .0022 pound
µg/L:	micrograms per liter (1 microgram = 1/1,000,000 gram), 1 gram = .0022 pound, 1 liter = 61.02 cubic inches or 1.05 liquid quarts
MMRA:	Metallic Mining Reclamation Act
MODFLOW:	Computerized groundwater flow model
STH:	State Highway
s.u.:	standard units, units used to measure pH
TMA:	Tailings Management Area
USR:	U.S. Route
USGS:	U.S. Geological Survey
WPDES:	Wisconsin Pollution Discharge Elimination System

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Introduction

The Department of Natural Resources (DNR) wishes to thank all of the citizens who attended the April 9 public meeting at New London. 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 on April 9 in New London. The Department has made an effort to include each comment that was raised by reviewing the questions submitted on cards and the videotape of the meeting. Unfortunately, not all verbal questions from the audience were audible on the tape. In the many instances that several individuals asked similar questions, an attempt was made to accurately paraphrase the general question while capturing the essential meaning. Of course, with the magnitude 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 are paraphrased, the reader is advised to check the original language if more complete information is desired.

The DNR's Authority & Review Process

1.

Q: With the large amount of staff and special consultants being used in this project and a time span of six years or more being spent, does this project even stand a chance of not being approved? Does the DNR believe the figures that Exxon submits to you or can you prove them wrong?

A: The mine permitting process, similar to other regulatory reviews conducted by the DNR, is a process through which the agency identifies whether a proposal meets or fails to meet regulatory requirements, and the applicant responds by amending the project accordingly. The practical outcome of this approach is that the areas of disagreement between the agency and an applicant, and thus the grounds for the agency to deny the requested permits, tend to be minimized. However, it is likely that not all areas of conflict will be resolved to the total satisfaction of DNR, and the agency will then recommend specific conditions to be included in the permits. Alternatively, if the agency finds that the project will not meet the criteria specified in the applicable laws and regulations, regardless of the imposition of specific conditions, the permits would be denied. In the case of the Crandon Project, there are still significant areas of disagreement between the DNR and the company, some of which could lead to a recommendation for denial of the necessary permits.

The DNR reviews, evaluates, and must verify the data gathered by the Crandon Mining Company (CMC) to be certain it is accurate and comprehensive.

2.

Q: A comment for the record: "The reorganization of the DNR making the Secretary of the DNR an appointed position, politicizes the approval process - because the Secretary decides the position making the final approval - judge or Secretary." By whom and how is the decision made whether the final approval is made by a law judge or the Secretary of the DNR?

A: It is true that the Secretary of the DNR will decide how the decision is made. Under Chapter 227 of the Wisconsin Statutes, the head of the Department 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 either approved or modified by the Department. After our Environmental Impact Statement (EIS) is released, we will indicate how the decision will be made.

3.

Q: We know that recently the DNR has become nothing more than a puppet of the governor. Why should we trust or believe any findings your agency may arrive at?

A: As in all projects, the Secretary has directed staff to review the Crandon project in a thorough and professional manner. The DNR has also hired knowledgeable, independent consultants to review the information provided by the company. The DNR consultants and staff have developed an extensive record of their review activities of the proposal. DNR files are public records open to anyone who wishes to examine them.

The above opinion needs to be examined in view of how the final decisions are made. At the Master Hearing on the proposals and on the adequacy of the EIS, the trial-like format 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. It also enables other parties to 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, under oath, for testimony and cross-examination. They will be asked if their supervisors or any others have influenced their decisions and if so, how. Finally, the conclusions of the decision-maker must be consistent with the criteria in the law on whether to deny or grant the permits and approvals. Should anyone believe that the process or resultant decisions were not made appropriately, the decisions can be appealed to a court of law.

The Department is fully aware of public concerns regarding political influence in this process. We want you 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.

4.

Q: Why is the DNR here tonight? To defend the mining operation? Who does the Department of Natural Resources work for? What is the DNR's stand on the mine?

A: The DNR was invited to this meeting by the Wolf River Preservation Alliance and the Tri-County Power Boat Association to provide a status report on the review process and to respond to public concerns about the proposed mine. As stated previously, the DNR has not taken a "stand" on the mine, but instead is a regulatory agency having the responsibility to review the proposed plans and determine if the project could comply with environmental laws and regulations. The applicable laws were developed by elected representatives in the Legislature.

The DNR works for the State of Wisconsin, and its regulatory responsibilities have been developed by the Legislature.

5.

Q: How many people who actually live along the Wolf or Wisconsin Rivers are an integral part of making a decision of such far reaching ecological consequences that may affect them directly, or do bureaucrats in Madison alone decide?

A: The DNR is given the authority by the Legislature to review mining proposals in the state. The most far-reaching role of any interested private citizen is to elect 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 ensures that all relevant public concerns will be addressed during the decision-making process.

6.

Q: Why has the Governor eliminated the Public Intervenor from this project?

A: The office of the Public Intervenor was eliminated by the Legislature with the consent of the Governor during the 1995-1997 budget deliberations. The Legislature and the

Governor have decision-making power over the budget. Since the Department of Natural Resources was not involved in this decision, these concerns may be best directed to the Governor's office or to your State Senator or Representative.

The Regulatory Framework

7.

Q: How old are the existing mining regulations?

A: The bulk of the existing mining laws have been in effect since 1978 and the major portion of the mining regulations have been in place since 1982. There have been specific additions and revisions of each, but the basic framework and requirements have not significantly changed since originally developed. More recently, two mining-related laws were passed in 1991. The first requires a mining applicant to deposit money in the Mining Impact Fund at the same time that their permits are filed. This money is then distributed to affected communities to cover negotiations with the mining company. The second law passed in 1991 addresses the prior record of a mining applicant (see response #24). Another law, passed in 1995, requires a mining company to maintain proof of financial responsibility even after the 40 year closure period is over.

Many other environmental laws and rules also apply to mining projects.

8.

Q: You stated that the mine must comply with existing standards for protecting the environment - At what point in time do you define compliance? Start-up? End of mining? 100 years? Infinity?

A: Mining involves many activities, some with a definite ending, and others that continue indefinitely. The required compliance would vary depending on the regulated activity and the type of impact. For example, the surface water discharge permit for a mining facility, assuming it would be granted, would contain the effluent limits that would have to be met as long as the surface water discharge was occurring. The air quality standards would have to be met during construction, operations and reclamation. When the site had met reclamation requirements and it was environmentally stable, the air quality permit would expire because there would no longer be pollutants emitted to the atmosphere. Relating to groundwater, the groundwater standards would be established prior to permitting and would have to be met at the compliance boundary forever because the TMA (Tailings Management Area) would be a potential source of pollutants for hundreds or thousands of years.

9.

Q: Please define the word 'mitigation' as it relates to the project.

A: The terms "mitigate" or "mitigation" do not have specific meaning in terms of the proposed Crandon project. They are commonly used environmental terms and generally refer to efforts aimed at lessening or compensating for project related impacts. We may use the phrase "wetland mitigation" to refer to the federal process which requires permittees to compensate for loss of wetlands by recreating wetlands in another location, as is proposed for