

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

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

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

20.

Q: The TMA cap and liner described in section 4.2.5.10 of the EIR (revised March 17, 1997) is as follows: "Geo/syntec (Dec. 1996) the HDPE geomembrane liner and cap at the TMA facility should function as designed for a long time (e.g. hundreds of years) without deterioration in performance." This is all that is said. The chemical nature and properties of the liner are never detailed. Also, what are the effects of subsiding over time, temperature and season on the composition of the liner?

A: A more extensive description of the components of the liner and capping systems of the TMA are contained in Addendum No. 3 to the TMA Feasibility Report, dated January 30, 1997. This report is available for review at the Department's Rhinelander and Madison offices. Chapter 4 in that document discusses the P40 till layer and the geosynthetic clay liner (GCL) components, and Appendix F discusses several aspects of the longevity of polyethylene geomembranes.

For the liner, there should be little in the way of subsidence, since the soils in the area of the proposed site are already heavily consolidated. The density and the gradation of the soils in the TMA area, as well as the depth to groundwater, would make for solid construction conditions. Settlement of the tailings is expected, but much of the major settlement would occur during the waiting period prior to placing the final cover. As the tailings de-water, they would consolidate and settle, becoming more physically stable. The leachate collection system would aid this consolidation by removing liquid prior to capping, resulting in reduced settling following capping.

In the long term, burial by till soil cover and tailings would serve to protect the liners of the TMA cells from the effects of seasonal and temperature changes. The tendency of polyethylene geomembranes to expand or contract with temperature is limited by soil cover. In the short term, the sideslopes would be more likely to feel the effects of seasonal changes, since the base grades would be covered by water and tailings soon after each cell is constructed. The sideslopes would likely be subject to freezing for a few years until the tailings cover them. GCLs have been shown to self-heal cracks formed by freeze-thaw effects. The P40 fraction soils should also be resistant to cracking. Both would be protected by the geomembrane and cover soil from the effects of drying. The 4.5 feet of cover soil, vegetation, and snow would protect the capping layer from nearly all freezing temperatures. Occasional freezing would do no damage to the capping layers.

21.

Q: The original plan for the TMA liner called for 3 feet of natural clay liner. We are now down to a GCL which is 1/4 inch of sodium bentonite plus 12 inches of screened Early Wisconsin till and a 60 ml. plastic sheet. This is supposed to last thousands of years, but no one can show us a single facility to date using this method which has not contaminated the groundwater. CMC is asking us to accept unproven technology to protect our groundwater, surface water and drinking water. Is this acceptable to the DNR?

A: The original proposed design for the TMA called for only one foot of natural clay in the liner and final cover. The Department gave CMC a choice of using a more conventional thickness for natural clay (3-4 feet in the liner and 2 feet in the final cover) or to use a combination of GCL and on-site low-permeability granular soils to substitute for the clay. The Department also discouraged CMC from using natural clay, since the amounts required would be enormous and the transport distances likely lengthy. Use of natural clay would lead to considerable disruption at one to several clay borrow sites and would likely lead to the obliteration of numerous wetlands or other protected resources located over the borrow sites. Due to the size of the TMA cells, it would take an extensive length of time to place and compact the clay, and the relatively short construction season on the project site could lead to poor compaction. Also, compacted clay on sideslopes would be more affected by freezing than would GCLs.

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

Laboratory tests have indicated that GCLs have lower permeability levels than clay liners. GCLs also have some significant construction advantages and significantly reduce the length of construction of liners. For these reasons, among others, the Department has begun to receive and approve landfill proposals for use of GCLs in liners or final cover systems. These uses are for composite liners or final cover layers, with the GCL used in conjunction with geomembranes. Although the Department does prefer the use of the GCL to the use of natural clay for the above reasons, the acceptability of the current proposal to the DNR has not been determined. The final analysis, when completed, will be presented in the DEIS.

22.

Q: Mercury level studies in groundwater and sediments of Little Sand Lake, Creek 12-09 and Rolling Stone Lake should be performed using the latest low level measurement technique. Is the DNR planning to do these studies? If not, why not?

A: At this time, the Department is not planning to perform low-level mercury studies on these waterbodies. The Department has collected much low-level mercury data from around the state and from many areas related to the mine review. Sufficient data exist for the review of impacts, etc. on these waterbodies. We have found that, for surface waters, the concentration of mercury does not vary to a great extent. Low-level mercury concentrations in groundwater are very difficult to measure accurately. Groundwater mercury has been measured in northern Wisconsin, and efforts are currently underway to measure groundwater mercury nearer to the tailings site. Representative sediment data exist for the review of impacts to surface waters in the area of the site.

23.

Q: There has been no collection of baseline data for the private wells in the Town of Ainsworth pertaining to heavy metals. Will such baseline data be collected? If not, why not? Also, some town residents have wells which are located on and in bedrock and produce low volumes of water. What measures will be taken to prevent impacts to these wells?

A: Groundwater chemistry data from monitoring wells in the site area was collected during the initial Exxon investigation and again by CMC in 1994. This data was verified by the Department through the collection of split samples. The results of this testing provide an indication of the average and range of groundwater quality in the area and is of value for permitting and impact evaluation purposes.

For regulatory purposes including damage claims related to private water supplies, the Department will need fresh data on a well-specific basis. It is intended that this sampling would occur just prior to the start of mine construction, if permits are granted. The extent of private well sampling would be based on the Department's review of the groundwater flow model and resulting forecast of likely impacts.

The Department is aware of the bedrock wells in the area, and we have construction reports filed by the well drillers covering most of these water supplies. We have reviewed the well construction reports along with other hydrogeological testing that has been done in the area. The information indicates that the privately owned bedrock wells would be affected by the mine pumping in the same way that the sand and gravel wells in the nearby area would. This is due in part to the fact that all of the bedrock water supplies are located a significant distance from the proposed mine and, secondly, that water in the upper bedrock fractures is not effectively separated from the water in the sand and gravel aquifer.

The mining company is liable for any damage to water supply quality or quantity caused by its mine pumping activities. Potential impacts would be determined using groundwater flow modelling and long-term monitoring. The Department would, to the fullest extent possible, require the mining company to deepen or replace identified wells prior to the actual impact.

MODFLOW Modeling

24.

Q: The current MODFLOW model has been modified to the maximum without any corresponding peer review. We believe that this is not a proven way of modeling. Is the DNR willing to accept this unproven method of modeling?

A: The Department recognizes that the MODFLOW program has been modified by the mining company in order to complete their analyses. To the best of our knowledge at this time, they kept us informed about the modifications they were making. We are reviewing those modifications as we review the flow model. Should any of the modifications be shown to be inconsistent with principles of groundwater hydrology and what we know about the site, we will require that the changes to MODFLOW be revised or removed. One of the specific modifications made by the company was to the Lake Stage Package, a component used in MODFLOW. We are doing a very detailed review of the revised Lake Stage Package, since it is fundamental to the model's ability to predict lake level changes from the mine de-watering. In addition, we have made it clear to the company that the revised Lake Stage Package should be published in a peer-reviewed journal as soon as possible.

25.

Q: In the geological cross section I-I, which is south of Swamp Creek, CMC made an assumption to change this cross section from coarse outwash to fine outwash based on drill hole No. RR-2, because the model was not converging. Additional raw field data with drillholes needs to be obtained to verify this assumption inasmuch as drill hole No. RR-2 is located considerably north of cross section I-I. Will the DNR request raw field data?

A: During the spring of 1996, the mining company was having difficulty getting the model to calibrate in the area north of the TMA along Swamp Creek. They suggested assuming a low-hydraulic conductivity zone in the glacial outwash in this area, but the Department indicated that making such an assumption in that area without data to support it would be unacceptable. The company then looked at more of the existing field information from that area and found that the RR-series borings showed that the outwash had thinned considerably. Accordingly, they revised cross section I-I' to take that information into account. This enabled them to proceed with the model without having to assume the outwash conductivity had changed in that area. At this time the Department is reviewing site geology and information inputs to the groundwater flow model. Pending the completion and outcome of that review, we will not be requesting additional data collection in that area.

26.

Q: Creeks 13-15 and 13-02, which are trout reproducing creeks and springholes feeding Rolling Stone Lake, are not being used in the model. Why not? Is there raw field data which shows that these springholes will not be impacted?

A: Creek 13-2 enters Rolling Stone Lake just to the south of the public landing. It is on the edge of the area potentially affected by the mine drawdown. For that reason, the Department will be looking at the creek to determine how it should be placed in the project's mitigation plan. The creek, however, is quite small and likely does not play a substantial role

in the regional groundwater system. Therefore, leaving it out of the regional flow model is probably not unreasonable.

Creek 13-15 enters Rolling Stone Lake further to the south and is removed from likely affects from the drawdown. It also is a small creek and likely does not play a substantial role in the regional groundwater system.

27.

Q: CMC has calibrated the groundwater model in EIR Section 4.2.5.2 (revised March 13, 1997) based on the following data:

- a. Long term pump test-24 days at Duck Lake (1991-Golder)
- b. The drought in the late 1980's
- c. Early Wisconsin till/saprolite pump test of 1994 (Foth & Van Dyke)
- d. Bedrock pump test-1981 (Camp, Dresser & McKee)
- e. Water table map of 1984

This is the foundation of the model. This data has not been agreed upon or accepted by the DNR or the other interested parties at the technical meetings in Madison. When will the DNR revisit this issue?

A: The Department is in the process of reviewing the groundwater flow model. Calibration information data was collected and presented to the Department at various times in the past. The Department oversaw the data collection and reviewed, to some extent, the content of the submitted reports. At this time, we believe the above referenced information to be useful in the modeling work and in the review of the project. The accuracy of all the conclusions or the validity of all the data is not certain. However, that does not mean that the information is of no use in this process. Until and unless further issues regarding this information arise during our review of the model, we do not intend to address the validity of the information in any future technical meetings.

28.

Q: CMC is using data in the model concerning precipitation which is being collected from the North and South Pelican weather stations north of Rhinelander. The evaporation studies are from the Rainbow Flowage in the west central part of the state. In 1986 both Exxon and the DNR used the data from the Laona weather station. Why is the data from the Laona site not being used this time around? Better yet, why has a weather station not been located at the project site?

A: The mining company has chosen to use the information from the Pelican weather stations in their groundwater work. The company has the right to use what they determine to be valid information in their work. The Department has no way to determine the reason the company chose to use the Pelican data over the Laona data. Recently the U.S. Army Corps of Engineers hired a consultant to review available climatological information and to determine the best available data sets. The Department will review that report when it becomes available and will likely use the information recommended by the Corps' consultant.

The company did collect some on-site weather data during the first year of the project. Though the Department requested otherwise, the company decided to remove the installation.

In order to have a detailed precipitation record, the Department has requested that the U.S. Geological Survey (USGS) set up a precipitation gauge on their lake gauge on Little Sand Lake during ice-free periods.

29.

Q: CMC shows in its contaminant transport model for particle tracking in the reflooded mine that the particle comes out of bedrock at the west end in approximately 600 years [Practical Worst Case (PWC) scenario]. The particle was placed at the bottom of layer 6. Why wasn't it placed at the top of layer 5 which is beneath the crown pillar? Is the DNR going to rerun the model with the particle at the top of layer 5?

A: At this time, the Department has not begun a detailed analysis of the contaminant transport modeling report submitted by the mining company. Therefore, we cannot predict what the outcome of that review will be.

Air Quality

30.

Q: The air quality in our community is pristine, per your DNR 1995 Air Quality Study. For example, particulate matter (total suspended particles or TSP) has a numerical reading of 9 according to the air monitor which was installed at the site where Creek 12-09 enters Rolling Stone Lake. This is the best in the state. CMC proposes in their Practical Worst Case (PWC) to bring this reading up to 116.5. At the Flambeau mine, which is basically a large gravel pit with no milling processes or tailings ponds, the particulate matter reading was 191 in December, 1995. The maximum allowable standard is 150. With a reading of 116.5, CMC will be permitted to contaminate our air by nearly 1200%! We are concerned about the health, safety and welfare of our people, our wildlife and our vegetation. What is the DNR's position on this issue?

A: The National Air Quality Standard for protection of human health regarding total suspended particulates (TSP) is set at 150 $\mu\text{g}/\text{m}^3/\text{hr}$. CMC has indicated in their submittals that the worst case analysis predicted a TSP 24-hour average value of 116.5 $\mu\text{g}/\text{m}^3$. This worst case hourly average meets the standards, but does indicate a potential increase in TSP concentrations within the study area. The Air Management program is conducting its own analysis of project related TSP emissions. These results will be presented in the DEIS.

The commenter is confusing the estimated annual average "9 $\mu\text{g}/\text{m}^3$ " value reported in the Wisconsin 1995 Air Quality Report with the worst case air impact analysis conducted by CMC's air consultant which provides results as both annual and 24 hour averages. Annual averages are expected to have substantially lower values than 24 hour event averages because 24 hour values are significantly affected by extreme meteorological conditions. The same 1995 air quality report source used by the commenter indicates the three TSP monitors in the area near the proposed mine captured existing 24-hour averages ranging between 137 and 52 $\mu\text{g}/\text{m}^3$.

The results of the DNR's work in modeling air contaminant transport will be released in the DEIS. If it is shown that the project would exceed air quality standards under the Federal Clean Air Act and State air quality regulations, it could not be permitted.

31.

Q: Methyl/mercury air deposition studies have not been completed. When will they be?

A: CMC has not been required by the Department to collect atmospheric sampling of methyl mercury because the proposed mine/mill is not expected to be a source of atmospheric methyl mercury.

Socio-economic

32.

Q: A socioeconomic study of our area must be performed before issuing the WDNR Draft Environmental Impact Statement (DEIS) and the results should be included in the DEIS. CMC's study in the EIR shows no impacts to our area, either environmentally or economically. This is not the case.

A: The Department agrees that the potential socio-economic effects of the mine must be studied for inclusion in the DEIS. To do this, the Department has hired two consultants with expertise in the area of social and economic impacts. Both consultants are with the University of Wisconsin - one from the Rural Sociology department and one from the Agricultural and Applied Economics department. These two consultants will be assisting the Department with review of CMC's studies, review of the relevant literature, and further study of the region around Crandon. The results of their work will be included in the DEIS.

33.

Q: The Town of Ainsworth receives forest crop revenues. What happens to our forest lands with reduced air quality and water quality and groundwater drawdown in future years? The effect on these revenues is an indirect impact to the town which has not been addressed.

A: Based on our preliminary calculations of air quality impacts to the Town of Ainsworth, assuming the Crandon mine were built, there would be no measurable effects on tree growth and resultant income from timber harvest. Air quality impacts should be limited to an area two or three miles from the mine and should not be visible impacts. Similarly, changes in surface water quality resulting from the project would be small and local and should not affect tree growth and timber harvest.

Most forest land in the township depends on rain and snow for the water necessary for growth, not groundwater. Some forested wetlands located where groundwater is discharged to the surface could be affected by the groundwater drawdown. However, these wetlands are some of the least productive in terms of timber harvest, and some of them would benefit from surface water mitigation that would be required of the Crandon Mining Company. Therefore, economic impacts to Ainsworth Township from reduced timber harvest would likely be negligible.

34.

Q: Property values in our area are a direct result of our clean air and water. The mine and its impacts will degrade both our air and water quality, and thus negatively affect our property values. Who will resolve this?

A: Our draft EIS will contain an analysis of impacts to property values should the project be developed. Development of an industrial facility in a woodland setting such as at the Crandon project site would change local land uses. As a result, there could be both positive and negative effects on land values close to the project site and along the main transportation corridor. Some tracts of land, such as developable land in favorable locations, may become more valuable because of their potential for more intensive uses. Other tracts, subject to noise, prolonged development, increased traffic or visually affected by the project, could decrease in value, although we believe this zone would be limited to areas within one to two miles from the mine.

The laws and rules that apply to air quality and surface water and groundwater protection, for example, are comprehensive. Therefore, we would not expect property values to decline in the Town of Ainsworth from environmental impacts of the mine, because such impacts should be prevented by existing regulations.

35.

Q: Our two main local industries are logging and tourism. These will be negatively affected with the degradation of our clean air and water and increased noise levels due to the mine. In addition to our concerns about water quality and quantity and air quality, we request that a four season 24 hour per day noise study be completed.

A: Any air and water quality impacts on tourism and logging will be addressed in the DEIS. However, the DNR has no authority to regulate noise. Noise impacts are regulated by local authorities, not by the DNR. A noise study was conducted in the 1980s by Exxon Coal & Minerals for their previous permit application.

36.

Q: The mine and its inflow of people will have an effect on the Elcho School District, our volunteer fire department, our volunteer rescue squad and our local roads. How will this be addressed?

A: Refer to Response #32 in Section I. You are correct in that additional people would move to the three county region and that some of them would likely choose to live within the Elcho School District, should the Crandon project be approved and built. The Department will provide estimates of the numbers of workers (and their family members) who would move to each municipality, and thus into each school district, and evaluate the impacts to each municipality. To make this determination, factors that may attract workers to settle in any one area would be considered. These include access to shopping centers, proximity to quality schools, available and affordable housing, distance to project site, and quality of roads. The company predicts that relatively few new residents would choose to settle within the Elcho School District, and thus the impacts to the school district, fire department and rescue squad should be minimal. If this were the case, the very small traffic increase in the Town of Ainsworth should have no more than a negligible effect on road maintenance. The

Department, with the help of its socio-economic consultants, will be evaluating these claims and including the analyses in the DEIS.

37.

Q: The mining project will require great volumes of reagents and chemicals to be transported to the mine site to be used in the mining and milling process. Is it known which mode of transportation and routes will be used to transport these reagents and chemicals? Local communities will need to have personnel who are properly trained in the case of an accident en route. Who will be responsible for training these people?

A: The actual routes and mode of transportation for various chemicals and reagents would depend on which suppliers are selected by CMC. These arrangements have not been made and would generally not be finalized until closer to the onset of operations, if the project is actually developed. CMC has indicated that the materials would either be shipped by rail or truck and would most likely originate from Chicago, Green Bay, Milwaukee, St. Paul or Duluth. Materials must be shipped using licensed transporters and in accordance with all applicable regulations, particularly those administered by the Department of Transportation. Under DOT regulations, the transporter must take immediate action to contain any spills and is also responsible for subsequent cleanup and the elimination of hazards to the environment and public health as a result of a spill. The DOT regulations also require that emergency response information accompany any shipping papers, so that local response agencies would be aware of the immediate threats posed by any spilled material as well as the initial methods for handling the spilled material.

Q: So, in summary, we feel that the socioeconomic issue has not been addressed. Will the DNR require that a new and complete socioeconomic study of the Town of Ainsworth be performed? If not, why not?

A: The socioeconomic impacts to the Town of Ainsworth have been evaluated as part of the company's socioeconomic impact analysis in the Forest-Oneida-Langlade County region. We are conducting an analysis of that study and may arrive at somewhat different conclusions, but a separate study of Ainsworth is not likely warranted due to the relatively low level of impacts forecasted.

General

38.

Q: Currently Broken Hill Proprietary Co. Ltd of Australia (BHP) has been granted an exploration permit near Bishop Lake by the Town of Nashville. This location is approximately 1/2 mile north of the Town of Ainsworth and approximately one mile west of the proposed Crandon mine. Are there going to be any studies by the DNR as to the possible cumulative impacts?

A: The Department will evaluate the potential of cumulative impacts relating to mine development in its DEIS. However, mining exploration occurring in a particular location has almost no bearing on future mining development. A valid cumulative analysis must be

based on what is known now, not on speculation. Following nearly 30 years of mineral exploration, only four ore bodies have been discovered in Wisconsin (one, the Flambeau ore body, has been mined, and site reclamation is occurring) along with a number of other areas of mineralization. The approximately 20 areas of mineralization are either too small in tonnage or too poor in mineral grade to be considered economical to mine in the foreseeable future.

39.

Q: The wastewater treatment plant will remove contaminants that cannot be transported to the Wisconsin River. These contaminants will be placed into the TMA. The TMA will leak forever into our groundwater. Why is it acceptable to put these contaminants into our groundwater and drinking water, but not acceptable to put them into the Wisconsin River?

A: The fate of wastewater contaminants would be as follows: Contaminants removed by the wastewater treatment system would accumulate in the solids that settle out in the clarifier or would be captured in the sand filter. The solids would consist of metals that precipitate out in the lime and sulfide treatment system as metal hydroxides and metal sulfides. The clarifier solids and backwash from the filter system would be pumped to the tailings ponds for disposal.

For the metals to contaminate groundwater, two things would have to happen. First, the metals must redissolve, which could occur under acidic conditions. And second, there would have to be a substantial leak from the tailings ponds. The TMA must minimize the formation of acid, be lined to minimize leakage, and have a leachate collection system to capture drainage from the tailing ponds before it could leak out. If a leak occurs, metals in an ionic state would likely attach to the soil and be relatively immobile.

While the Department has not yet completed its groundwater impact analysis, it probably would be acceptable to dispose of the wastewater treatment solids in the TMA because that proposed facility should be capable of isolating wastes from the environment for the long-term. The composite liner beneath the TMA would allow only tiny amounts of leakage to ultimately reach the groundwater and then move over a period of many years away from the site. By law, the tailings ponds must provide containment to prevent the release of the metals back into the environment at concentrations exceeding groundwater quality standards beyond the compliance boundary. Also, the Department would not allow the contamination of drinking water supplies. Groundwater contaminant transport modelling would predict whether groundwater and drinking water quality standards would be complied with.

40.

Q: In EIR Section 2.2 (revised September 29, 1995) CMC is requesting an exemption from testing for "organic substances, turbidity, radioactivity, asbestos, fluoride, bacteria, color, corrosivity, foaming agents and odor." Has any raw field data been submitted to verify that these items will not occur at the proposed Crandon project? Is this requested exemption valid?

A: These exemptions would not be granted or denied until the master hearing process. CMC would be wholly responsible for justifying such exemptions. The Department has not made any determinations on the validity of such exemptions. Possible justification for

the one of the requests might include existing information showing no asbestos fibers and no significant amounts of radioactivity above background levels. Therefore, testing for these may not be necessary.

The company must provide evidence to support its requested exemptions at the master hearing. All parties may provide relevant information addressing the exemptions. The decision-maker may only grant an exemption if no other environmental protection law or rule would be violated and if the exemption is consistent with the provisions of the mining law.

41.

Q: Currently state groundwater quality protection standards allow a 1200 ft. compliance boundary in areas where mining wastes will be stored. No other activity or a private citizen is allowed this, including hazardous waste facilities. Does the DNR support this excessive compliance boundary?

A: The current rules and the recently proposed revisions to Ch. NR 182 include a 1,200 foot distance to the compliance boundary and the design management zone, respectively. In light of the manner in which mining waste facilities are evaluated and monitored, the Department feels that the dimensions of the compliance boundary and design management zone are reasonable and provide for protection of the groundwater. An owner of a mining facility may not cause adverse impacts to groundwater under adjacent properties, may not adversely affect another property owner's water supply, and may not cause adverse impacts to surface water quality.

Langlade County Zoning Ordinances & Town of Ainsworth Metallic Mining Regulations

42.

Q: Little Sand Lake is located partially in Langlade County and the Town of Ainsworth. This section of the lake as well as the Town of Ainsworth are covered by Langlade County zoning ordinances and the Town of Ainsworth Metallic Mining Regulations concerning the degradation of ground and surface waters, wetlands and air quality. In addition, noise pollution, lake levels and stream levels are covered. How can this project conform to the Langlade County zoning ordinances and the Town of Ainsworth Metallic Mining Regulations?

A: Typically, ordinances are intended to apply only to activities located within the jurisdiction of the municipality which has adopted the ordinance. The extent to which the County and the Town are empowered to enforce their ordinances on an activity which is physically located outside their jurisdictions must be answered by the attorneys for the County and Town. They, not the Department, are responsible for providing legal advice on enforcement of their ordinances. One additional point is worth mentioning. Municipalities can only enforce those regulations which they are empowered to administer. The Wisconsin Supreme Court has regularly stated that waters of the State are held in trust by the State of Wisconsin. Municipalities have only very limited authority to enforce ordinances which attempt to regulate uses of state waters. See also response #43, Section I.

43.

Q: What plans of mitigation for the loss of aquatic habitat and fish in Creek 12-09, Creek 11-04, Upper Pickerel Creek and Martin Springs and the reduction in dissolved oxygen levels in Rolling Stone Lake due to the drawdown are being contemplated? How will these mitigation efforts be coordinated with our current non degradation standards in our (Ainsworth, Langlade County) mining ordinances and regulations?

A: Should Rolling Stone Lake need mitigation for the loss of dissolved oxygen during ice-covered periods due to mine drawdown, the most likely scenarios involve either adding water to creek flows or installing an aerator in the lake. There are also other potential mitigation options that the mining company may propose. At this point, since we are still reviewing the groundwater flow model, we are not certain mitigation would be necessary. However, under the mitigation plan, the company would likely be required to identify possible mitigation systems for all three creeks identified in the question.

The Department is unfamiliar with the "non degradation standards" in Town of Ainsworth and Langlade County mining ordinances and regulations. However, if these standards are intended to apply to waters of the State, they are likely unenforceable. The Wisconsin Supreme Court has regularly ruled that local municipalities have only very limited ability to regulate waters of the State. Those limited powers must be expressly authorized by the Legislature. If there is any doubt regarding the validity of these local ordinances and regulations, the attorneys representing the Town and County should be consulted.

II. QUESTIONS & STATEMENTS FROM THE AUDIENCE:

The DNR'S Responsibility

1.

Q: The DNR and the State can't make decisions about polluting our groundwater and surface water - this is our water, not yours.

A: The law clearly states that both surface and groundwater are "waters of the State" and belong to all citizens of the state, present and future. Accordingly, the state Legislature is responsible for protection of the waters of the State. It, in turn, assigns regulatory responsibility to various state and local governmental bodies. By interpretation of the Wisconsin Supreme Court, under what is called the Public Trust Doctrine, almost all decisions regarding surface waters have to be made at the state level of government. The strongest statement by the Court was made in 1951 in Muench v. Public Service Commission. This decision has only been strengthened by subsequent Court rulings. Under these Supreme Court decisions, it would be unconstitutional for the Legislature to delegate significant decision-making regarding surface waters to local units of government.

As with surface waters, the Legislature is also responsible for protection of groundwater. However, it has greater discretion as to which units of government it may assign responsibility for groundwater protection. In fact, the Legislature has provided for a greater level of county involvement in groundwater protection than exists for surface water protection. Nevertheless, the Legislature has assigned most of the responsibility for protection of groundwater to state agencies. With regard to mining activities that could affect groundwater, the Legislature has given explicit direction in the form of state statutes that the Department of Natural Resources is responsible for assuring that groundwater standards are adopted and maintained in order to protect the public health, safety and welfare.

2.

Q: Who is the DNR working for - the mining company or the people of Northern Wisconsin? Why don't we people of northern Wisconsin have a say in whether or not mining will be allowed?

A: The Department, as an executive agency, works for all the people of Wisconsin. As implied by the Constitution of the State of Wisconsin, the will of the people is expressed in the laws passed by the elected legislature and approved by the elected governor.

All interested parties will have the opportunity to participate in the Master Hearing process from which a decision on this project will be made.

3.

Q: Why is the DNR working with the company to make sure its plans can be permitted? You should just say no if their proposal wouldn't meet requirements.

A: An applicant for any permit, license or approval from the Department of Natural Resources has the right to know how the Department interprets its laws and regulations, and how it intends to regulate the proposed activity. The DNR wants to be very clear with an applicant on what the laws and regulations require. Because of Wisconsin's thorough and

comprehensive regulations, a mining applicant must obtain a large number of permits, approvals, and licenses from the DNR in order to mine. It takes several years for an applicant to plan for the design, construction, operation, closure, reclamation and long-term care of a mining site that meets these requirements. In addition, it could be a waste of our time not to completely explain our regulatory authority if it meant an applicant had to redo a study or analysis or gather additional data. The bottom line is that if the mining proposals cannot meet the standards, we must just say no.

4.

Q: How can the Department do a proper job of protecting the environment, when it is the product of a union between the Wisconsin Conservation Department and the former Department of Development? It seems like the two arms pursue different goals.

A: In the late 1960s, the Wisconsin Conservation Department was merged with a number of programs within the Department of Resource Development to form the existing Department of Natural Resources. This change was made to promote closer cooperation between state programs that had direct impacts on natural resource management in the state. The remainder of the Department of Resource Development exists in the present-day Department of Commerce, which promotes economic development in the state.

Everything the Department of Natural Resources does is based upon laws passed by the legislature that govern the management of our state's natural resources. If a law is passed by which established programs would operate at cross purposes, and the heads of the agencies involved cannot agree on a solution satisfactory to citizens, then it would most likely need to be resolved through action by the Legislature, or by the Legislature's Joint Committee on Administrative Rules.

5.

Q: In over 15 years, the Department still doesn't have the answers to our concerns. How long will it take?

A: In the mid-1970s, Exxon Corporation initiated the mining permit review process, which was extended by a major review of the mining law. In late 1986, the company withdrew its application and the Department ceased to work on it. It has been only about three years since the current mining permit application review and EIS process began. As everyone can appreciate, evaluating the potential impacts of mining is a very complex process. The Department, as a part of its review, has sometimes required that Crandon Mining Company provide additional information on underground geological conditions, stream flows, rare plants and animals, etc., which requires additional time. Hiring outside expert consultants to assist the Department in its review also requires additional time. Furthermore, those involved in the Department's review process are highly recognized professionals with other commitments that may prevent them from giving necessary reviews their immediate attention.

The Department will have more detailed answers to the more technical questions posed during this review process once groundwater modeling issues are settled. We anticipate release of a Draft Environmental Impact Statement in early 1998. This date is an estimate, not a deadline, and may be extended. Overall, Department staff will be able to answer the balance of the many questions raised by this project only after staff are satisfied that we have looked into every conceivably important aspect of this project.

6.

Q: There are valuable wetlands here, and lots of publicity on the importance of protecting wetlands. How can DNR allow wetland destruction by the mining company when it won't allow the public or other industries to harm wetlands?

A: Primary authority for wetlands regulation is with the federal government under Section 404 of the Clean Water Act. In Wisconsin, there is no single comprehensive wetland protection law. However, wetlands protection occurs through several administrative codes and authorities.

For most projects that will impact wetlands, though the federal government (US Army Corps of Engineers) has permitting authority, the state has significant influence over decisions through what is called state water quality certification. That is, before a federal permit can be granted, the state must certify that the project meets state water quality standards.

It is not true to say that the DNR won't allow harm to wetlands, since projects can be permitted if the project proponent can show that there is not a "practicable" alternative that avoids wetland impacts *and* that the project will not result in significant adverse impacts to wetland functional values. Projects that meet these legally established standards are permitted.

The laws protecting wetlands are different for metallic mining than for other activities since a mineral deposit is set in a fixed geographic location and some impacts to nearby wetlands as a result of mine development may be unavoidable. The state mining regulations (specifically Chapter NR 132, Wis. Adm. Code) specify that impacts to wetlands must be minimized. This is accomplished in several ways: 1) through selection of facility (e.g. tailings management area, mill, transportation corridors, pipelines and utility rights-of-way) placement alternatives that reduce wetland impacts; 2) through detailed evaluation of the functional values and characteristics of wetlands within a proposed mining project to be certain that, where viable alternatives are available, wetlands with the highest values receive the least amount of impact; and 3) through a showing by the applicant, with DNR agreement, that the area selected as the mining waste site is one with the "least overall environmental impact." Impacts to wetlands are a major factor in evaluating the overall impacts of the proposal.

In conclusion, to meet wetland protection requirements, the proposed mine project will need to address the requirements of NR 132 to meet State law, and those under Section 404 of the Clean Water Act, to meet Federal law.

7.

Q: The DNR does have decision-making power about the regulations. What about the DNR's obligation to recommend better standards to the Legislature if the public demands it?

A: It is the responsibility of the Department to implement directives it has received from the Legislature. This is accomplished in Department actions and decisions consistent with statutory language. If the statutory language requires further clarification or criteria development, the Department promulgates administrative rules, which have the effect of law. In addition, the Department regularly makes recommendations to the Legislature regarding the need for legislation. Those initiatives usually relate to matters of a technical nature about which the Department has special expertise. However, most of the discussion regarding changes in laws associated with mining involve policy issues. In our representative form of

government, when citizens believe policy changes are needed, it is their responsibility to petition their legislators. It is through this process that the will of the public is evaluated. For this reason, agencies in the administrative branch of government should await the legislative decisions, then implement them as the Legislature has directed.

The Department has recently proposed changes to the mining rules. Statewide hearings on the two proposed revisions were held in May. First, the proposed change to NR 132, Wisconsin Administrative Code, would require a mining permit holder to establish a trust fund to guarantee the availability of funds for necessary remedial actions. This fund would assure the availability of funds for implementation of necessary preventative measures and remedial actions in the case of unanticipated environmental contamination. The trust agreement would cover costs associated with occurrences such as spills, releases from the mine and waste facilities, damaged water supplies and periodic replacement, if necessary, of waste facility containment features (such as a cover system).

Second, proposed changes to NR 182, Wisconsin Administrative Code, would relate to the groundwater quality requirements for mining projects. The Department is revising the rule so that mining operations would be subject to the groundwater quality provisions of ch. NR 140, the rule which implements the state's groundwater law. This is the same rule that applies to other regulated activities in the state, such as landfills and wastewater treatment facilities. Under the proposed revisions, mining sites would be required to be designed and operated in a manner which would comply with the same numerical groundwater standards as other industries.

These proposed rule changes were proposed by the Department as a result of petitions from legislators requesting that the DNR analyze these existing rules and recommend changes.

The Mine

8.

Q: Exactly what "state-of-the-art" technology is being proposed for this mine? (And for analyzing its impacts??) Why would any of them be able to prevent the type of mining-disaster that has taken place historically?

A: The basic principals of environmental control and reclamation have been available for a long time. The problem was that until about twenty years ago, no one forced mining (and many other industries) to employ the environmental control technology that today everyone accepts as being essential. While it is true that the environmental revolution has produced some significant improvements in environmental control and analytical technology, most of what is being proposed could have been accomplished fifty years ago using materials and equipment that were available at that time if the public, by law and regulation, had insisted that environmental protection at today's standards was necessary.

Wisconsin has comprehensive requirements in its laws and rules relating to mining projects that mandate environmental protection before approval and construction of a mine. If a mining project were approved, intensive environmental monitoring is required during and long after operations. We have the ability to intercede in the event of early evidence of an unexpected problem. Finally, the state's requirements for financial responsibility, bonding, insurance, reclamation, long-term care and perpetual liability will help to ensure that

environmental disasters will not occur and that the state's citizens would not have to pay financially.

9.

Q: How big is the ore body? Is it on the surface or underground?

A: The ore body and proposed mine would be underground. The 55 million ton ore body runs east-west for a length of approximately 4,900 feet, has an approximate width of 100 feet (N-S), and extends to a depth of about 2,200 feet below the surface. It is covered by 100 to 230 feet of unconsolidated glacial drift.

10.

Q: Is a short-term economic gain worth the risk of a long-term environmental catastrophe?

A: The mining laws and natural resource protection laws that guide the Department's review of the mining proposal reflect the general public consensus that short-term economic gain is in no way worth the cost of long-term resource harm. What is at issue is whether the best means available to predict the impacts of any particular mining plan are able to provide us with an accurate picture of what would happen. As we have stated many times before, if the mining proposal cannot meet the environmental protection standards in state laws and administrative codes, the Department cannot issue a permit to mine.

11.

Q: What recourse is available to citizens once the permits are issued and the mine begins operation?

A: Let's assume that the master hearing is over and the written decisions have been issued. The decisions on permit issuance or denial or on EIS adequacy may be appealed either to the Department Secretary or, more likely, to the Circuit Court. The Circuit Court decision may be appealed to the Appeals Court, and ultimately to the Supreme Court if one or more of the litigants wishes to pursue a challenge.

Now let's assume that court actions on the permitting decisions and EIS adequacy have been resolved, and the project is being constructed or operated. Under these circumstances, citizens may initiate a lawsuit against the mining operator, if they believe that mining laws are being violated, or against the DNR if they believe the DNR is failing to appropriately regulate a mining operator.

There are other ways citizens can utilize the legal system if they are affected by mining operations. Sections 107.30-107.35, Wisconsin Statutes, define the special provisions governing the liability of mining operations for damages they cause to persons or property. Mining-related damages are defined to be death or injury to a person or property caused by environmental contamination from emissions, seepages, leakages or other discharges from mining operations, and encompass injury as a consequence of land surface subsidence. The law specifies the procedure for filing mining damage claims. The mining law also provides a recourse for individuals who claim their water supply has been damaged by a mining operation. Such individuals may receive relief in the form of an alternative water supply and limited financial compensation based on the review of their complaint by the DNR.

12.

Q: Crandon Mining Company won't be around forever. When they leave or go out of business, what recourse would people have to recover any economic losses or correct any environmental damage?

A: Environmental damage and economic losses are two separate issues. In the case of environmental damage, the state would be responsible for recovering the necessary money from the company to repair the damage. Should CMC go out of business, its parent companies, Exxon Coal & Minerals and Rio Algom, would become responsible for the site. This means that they would be required to mitigate any environmental damages.

In addition, the bonds and other financial sureties held by the state for this purpose are independent of the company, and are available to the state regardless of the solvency of the mining company. Recent proposed changes to the mining rules include a provision for a dedicated trust fund that would be funded by the mining company prior to and during operations. A financial institution would manage the trust, and only the Department could withdraw funds. The trust fund would be designed to be self-sustaining and remain in place after operations ceased, for as long as needed. Its purpose is to serve as a backup source of funding to cover remedial actions related to unanticipated spills, releases from mining waste facilities, and replacement of damaged water supplies.

Even if the company were sold, the new owner would be responsible for any environmental problems. However, the original operator might still be held liable for costs related to environmental contamination which occurred as a result of their actions. In regard to the long term, an owner's responsibility for management of a mining waste site never ends.

Economic losses would be addressed at the discretion of the State Mining Impact Fund which is funded by the net proceeds tax while the mine is operating.

13.

Q: What would be the cumulative impacts of more than one mine in operation?

A: In Wisconsin, four ore bodies (areas of mineralization that may be economically feasible to mine) have been located and defined. One, the Flambeau Mine near Ladysmith, is nearing the end of production and will be closed and reclaimed well before any other mine could open. Therefore, the maximum impact mining scenario that can currently be foreseen would occur if all three remaining ore bodies were mined simultaneously, although since exploration is continuing, it is possible that one or more additional ore bodies could be found. However, to speculate that ore bodies might be discovered in the future would be without basis. Also, the Department's experience demonstrates that even if another ore body were found today, it could not become operative for a minimum of seven to ten years. The four known ore bodies are located across 100 miles of northern Wisconsin in Forest, Oneida, Rusk, and Taylor Counties. If all were ever developed, no mine would be closer than 30 miles to the next nearest mine.

Cumulative natural resource impacts would be expected to be minimal, since each individual mining project would have to meet state requirements protecting surface water, groundwater, and air quality. The total acreage potentially disturbed by mining development at the four known ore bodies would be approximately 1,400 acres. Natural habitat, including forests, swamps, wetlands, and other types would be destroyed during the mining projects. However, Wisconsin's mining law requires reclamation of the mining site and waste disposal

areas.

Cumulative socio-economic impacts would likely be limited, but each project-specific environmental impact statement would address the concerns associated with that project as well as in combination with other pre-existing projects. Labor pools, shopping areas, and raw material suppliers for the mines would be mostly separate and distinct with one potential exception: the Rhinelander area could be affected by both CMC's Crandon Mine 30 miles to the east and Noranda's Lynne Mine 40 miles to the west. These and other potential cumulative impacts are addressed in the Department's mining information sheet, *Cumulative Impacts of Mining*. See the phone numbers in the introduction to obtain a copy of this document.

14.

Q: Has there ever been a sulfide mine that didn't cause pollution?

A: There are a number of sites around the world where sulfide mining wastes have been successfully reclaimed. Some of the sites may not be geologically similar enough to proposed sites in Wisconsin and some sites were reclaimed after problems were allowed to develop and some use technology that would probably not be approvable in Wisconsin, but the sites have nevertheless been reclaimed. All of this information is important insofar as it adds to our understanding of the technology available to deal with potentially acid-generating waste materials, but it cannot substitute for case-by-case evaluation of a proposed project.

Information about successful operations elsewhere is not required under the existing permitting requirements. Such information would have little relevance to the determinations that are currently required in Wisconsin. Simply because a given technology worked or failed in another setting does not guarantee the same result in Wisconsin.

Under our present regulatory structure, each mining project is subjected to a comprehensive review through which the applicant must demonstrate that the project is designed and will be operated and closed in a manner which will not cause violation of Wisconsin's applicable environmental protection laws and regulations. In conducting its review, Department staff will rely on their training, experience, and familiarity with current technology to determine whether a given project is acceptable. Should the Department find that a proposed project will not comply with the applicable regulations, the necessary permits would not be issued. The Department believes this approach - conducting a thorough and critical technical review of each specific proposal on its own merits - is the proper mechanism for evaluating whether a proposed project meets Wisconsin's standards for environmental protection and ultimately whether such a project should be approved.

The TMA

15.

Q: Why wasn't the McKee report on tailings reprocessing evaluated on the basis of technical feasibility rather than economic profitability? Why won't the tailings be further processed into pyrite, etc.?

A: Please see Response #16 under Section I. CMC has not proposed to reprocess the sulfide tailings and the Department cannot by law require it. The Davy-McKee

reports were evaluated during the 1980s as part of the Exxon project review, for both technical feasibility and economic feasibility. The technology of processing sulfide tailings has been available for some decades and is well-established, as are the potential technical and environmental effects of reprocessing of tailings.

One of the major problems is that any processing scenario usually starts out separating the sulfide portion of the tailings from the non-sulfide fraction. However, in practice, that separation cannot be done cleanly enough to allow the reject fraction to be classified as non-sulfide. That fraction would still need a disposal site and would still have the potential for forming acid drainage. While processing tailings would not eliminate a need for a disposal site, it would greatly increase the scope of development around the mine and mill. Also, processing of the sulfide fraction would start with burning or oxidizing the sulfide minerals to produce sulfuric acid, a process that can create substantial air pollution, consumes water, fuel, and electricity, and requires a major industrial plant.

There are some relevant lessons from Wisconsin's experience with recycling. When prices of recycled material go down, less is collected and more goes back to landfills or the collection agencies are left with stockpiles of unwanted materials. Recycling has not turned out to be an assured way of getting rid of solid wastes. The same problem would affect any reprocessing of mining tailings. If the prices for products of processed tailings falls, the material still has to have a place to go. Also, if a processing plant is dependent on the production rate by the mine and mill, it will not have the flexibility that it needs to tailor production to its own markets.

There are a few places in other countries where pyrite is used as a feedstock for production of iron ore or sulfuric acid. However, this part of the industry is declining, due both to environmental problems and competition from other sources of these materials.

16.

Q: Will there be uplifting capillary pressure on the water table from all the pressure of the tailings since there is only 18 feet between the bottom of the TMA and the water table?

A: Uplifting capillary pressure would not be expected to be a problem for two reasons. First, capillary pressure is dependent on particle size and pore space. The presence of the TMA should not cause these two characteristics to change in the ground under the TMA. Second, the construction of the TMA would mean groundwater recharge under the TMA would be reduced substantially. Therefore, the groundwater level would be expected to decrease under the TMA. The capillary fringe to the water table would likely remain the same thickness, but would be located deeper.

17.

Q: When the TMA liner leaks, how will groundwater quality and recharge be affected?

A: All liners, including natural clay liners, will leak to some degree - but only tiny amounts if they're installed correctly. In modeling the transport of contaminants from the TMA to the groundwater, we assume leakage rates that are based on a separate water-balance model of the TMA construction and operation. The range of results that are produced by the model then becomes the values that are used to determine if the facility will comply with groundwater standards far into the future. If the facility is predicted to exceed groundwater

standards at the compliance boundary or property line, whichever is closer, the proposed design cannot be permitted.

Groundwater recharge under the lined portion of the TMA would essentially be eliminated by the liner and cover systems. Storm water runoff from the cover is proposed to be directed to adjacent wetlands where it would contribute to local recharge and runoff. The lined portion of the TMA represents less than 3% of the total available recharge surface area of the local groundwater system.

18.

Q: None of the technologies being proposed for this project have been proven. Has the TMA liner material been tested over a long period of time? Has the proposed TMA liner material been tested holding tailings from sulfide mines? Has it been tested in similar soil conditions? Why should we risk our clean water to unproven technologies?

A: As noted in Response #8, Section II, the basic principals of environmental control and reclamation have been available for a long time. While it is true that the environmental/technological revolution has produced some significant improvements in environmental control and analytical technology, most of what is being proposed by CMC today could have been accomplished fifty years ago using materials and equipment that were available at that time. However, until about twenty years ago, no one forced industries or municipalities to employ the environmental control technology that today everyone accepts as being essential. The major technological difference would be in the improved precision for the monitoring of all phases of the design, construction, operation and closure and the ability to analyze this data with the use of high speed computers.

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

The mine cannot be permitted if it is determined that it would violate groundwater and surface water protection standards, even if the violation would not be expected to occur for hundreds of years into the future.

19.

Q: What can be done when our air and soil are polluted?

A: If this project is permitted, it would have an extensive environmental monitoring program that would require detailed groundwater and surface water monitoring on and around the facility. In addition to groundwater and surface water monitoring, the mine and tailings facility would be monitored closely to make sure they are performing as designed and predicted. This monitoring should detect discharges of contaminants to groundwater or surface water quickly. Should a significant release of contaminants occur that is not quickly detected, the monitoring program would find it prior to movement outside the watershed. At that point, a clean-up program would be initiated. Depending on the type of release, clean up could involve repair of the tailings facility, installation of cutoff walls, pumping of groundwater

for treatment or to control movement, installation of reactive walls, or many other techniques.

20.

Q: How would freeze-thaw damage to the TMA liner be prevented, considering that frost depth can be as great as eight feet?

A: The upper surface of the tailings may freeze, but the depth of freezing would be limited, since wet tailings would take longer to freeze than dry soil. The continued discharge of tailings during the winter months would limit the depth of freezing as well. The tailings surface that freezes one winter would be buried and protected before the next winter. Actually, freezing tailings has beneficial effects, since this would aid in densifying the tailings and reducing the moisture content. The tailings would not freeze directly to the top of the geomembrane, since the geomembrane would be protected by a layer of till soil.

Successive winters would result in freezing during the winter of the upper few feet of the final cover system on the top of the TMA and the soil embankments on the sides of the TMA. The soils would thaw each spring. The effects of freeze-thaw patterns on these soils would be the same as on other soils in the area. The depth of freezing on these soils would not be as deep as might be expected around buildings, since foundations artificially deepen the zone of freezing. The capping layer would be protected by enough soil to prevent freezing conditions from reaching it during most winters. None of the components of the capping layer would likely be damaged by occasional freezing.

21.

Q: While doing monitoring around the mine site and TMA, how would the Department determine how much seepage and pollution of groundwater is too much?

A: Assuming the project were permitted and operating, groundwater beneath and around the TMA would be monitored. If there were changes from the baseline water quality, the company would have to evaluate the source and future impacts of the change. We would compare the actual change to the predicted change. Based on this analysis, we would make predictions on whether the groundwater standards would be met at the compliance boundary. The same process would be followed for monitoring groundwater quality around the abandoned mine. If changes in water quality were predicted to exceed standards, the mining company would have to implement an acceptable remediation program or would be required to cease the activity causing the problem.

The Groundwater Drawdown and Well Impacts

22.

Q: What will be the impact to shallow (15 to 35 feet) and deep (down to 225 feet) wells if the drawdown will be one foot or more? How will we still have any water left in our wells with all the groundwater that will be withdrawn? Who will replace the water if our wells go dry?

A: Impacts to water wells depend on the amount of the groundwater drawdown at the well site, the depth of the well, the depth to water, and the location of the pump relative to

the groundwater table or surface. The DNR will make worst-case predictions of groundwater drawdown and compare the predictions to the locations of known water wells. We would require the Crandon Mining Company to provide an alternative water supply to the dozen or so potentially affected wells prior to significant underground mine development.

Monitoring of the groundwater levels would continue as underground mining begins. Should the groundwater drawdown extend further than predicted, we would require the company to take action on the additional affected wells. Based on this course of action, we would not expect anyone to lose their water supply.

In addition, the mining law includes a process through which landowners may seek relief if they feel the quality or quantity of their water supply has been affected by a mining operation. If the mining operation is found to be the cause of the problem, the operator would be ordered to provide an alternate source of water of comparable quality and quantity.

23.

Q: In the 1980's the predicted drawdown of Little Sand Lake was 6 feet. Now the prediction is .6 feet. Why the dramatic change?

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

24.

Q: Why can't the company treat the water well enough to discharge at the mine site?

A: The Department has no authority to dictate the location of any industrial or municipal discharge. It does have the authority to require that any discharges meet all applicable surface water quality standards. Although technology exists to treat the mine drainage water to a greater degree, it is quite expensive and more difficult to operate such systems. Presumably for these reasons, the company has requested to discharge into the Wisconsin River. This discharge could only be permitted if it would be able to protect the water quality standards of the Wisconsin River, thereby protecting human uses of the river and the most sensitive aquatic life.

25.

Q: How can the Wolf River withstand the loss of flow from groundwater drawdown and the resulting increase in water temperature?

A: Public rights in the Wolf River tributaries of Swamp Creek and Pickerel Creek

must be protected during this project. If Swamp and Pickerel Creek are protected, then we believe the Wolf River would also be protected. Once the Department completes its determination of how groundwater and stream flows could be affected, we will compare the projected impact to the Wolf River with the identified public rights stages. (See the discussion on "public rights stages" in Response #28 in Section II.) If the mine de-watering would reduce the stream flow below the public interest stage, then the mining company would be required to add enough clean water (probably to affected tributaries) to make up the difference.

26.

Q: Where would the surface mitigation water come from? Won't pumping groundwater for mitigation dry up the springs in the vicinity of the wells? This will only make the drawdown worse.

A: There are three main potential sources of mitigation water: intercepted (uncontaminated) mine water, treated mine wastewater, and specially pumped groundwater. The Department has indicated its preference that intercepted mine water and treated wastewater be used whenever possible where mitigation is necessary. Use of those two water sources would reduce the water to be pumped through the pipeline to the Wisconsin River and it would limit the additional impacts from specially pumping mitigation water. There is no question that specially pumping mitigation water would increase the drawdown.

27.

Q: How accurate is the DNR model, in light of the inaccuracies of recent North Dakota flood flow predictions?

A: A surface water flow model and a groundwater flow model are significantly different, but both are computer operated mathematical models. Any mathematical model is no better than the information that is put into it. The Department is determined to fully verify the Crandon flow model construction and input data. Wherever there is any doubt regarding data validity, we will use conservative estimates in order to produce an appropriate worst-case forecast of potential impacts.

28.

Q: It won't take much drawdown to turn Rollingstone Lake into a mud hole. How can this be allowed?

A: The preliminary results of the groundwater modeling indicate that Rolling Stone Lake would be unaffected by the mine-related drawdown. This will be further discussed in the DEIS. Laws safeguarding public rights in state waters prohibit the Department from allowing such major impacts to occur.

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

constant year-round elevation or flow).

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

29.

Q: When groundwater levels recover after mine closure, would the groundwater still be of excellent quality?

A: Compliance with groundwater quality standards have to be predicted to be maintained throughout time by this project - or the project cannot be permitted. At this time, the Department has not yet begun a detailed analysis of the contaminant transport modeling report submitted by the mining company. Therefore, we cannot predict what the outcome of that review will indicate about expected groundwater quality following recovery of groundwater levels.

Air Quality:

30.

Q: Our air quality is the best (rated at "9") in Wisconsin. Can DNR guarantee that it will remain as clean? How about 30 years from now?

A: The mine/mill complex would be required to meet all applicable air quality rules and permit conditions if permits are issued to construct and operate the proposed facility. If the mine/mill is constructed, it would have its most noticeable air quality impacts in the immediate vicinity of the facility. Air quality in the region will undoubtedly change over the next thirty years, whether this project is permitted or not. These differences will be due to changes in population, tourism, life styles of the residents, modes of transportation, industrial activities (e.g., mining (metallic and sand/gravel), pulp/paper, wood products and other sources as well as regional and global sources of carbon dioxide, mercury, ozone and other atmospheric pollutants). Without knowing the actual developments that might occur, discussions of air quality changes in 30 years are purely speculative.

The "9" value referred to by the commenter is $9 \mu\text{g}/\text{m}^3$, which is an estimated annual mean for ambient TSP (Total Suspended Particulates) and PM10 (particles smaller than 10 microns in diameter) based on sampling near the proposed Crandon mine site. The number is reported in the DNR-Air Management program's Wisconsin 1995 Air Quality Report. This annual average is the same for both TSP and PM10. This number only considers those two factors - it does not consider compliance with any other air pollutant standards. See Response #30 in Section I for more details.

31.

Q: Are train exhaust, hopper car ore dust, and other pollutants due to the increased vehicle and train traffic factored into the air quality model? The DNR should look at increased air pollution along all the major transportation routes that would be affected by the mine, like the Wolf River corridor.

A: The DNR air quality modeling will assess potential changes in the existing air concentrations of the air pollutants which are regulated by existing federal and state laws. These include suspended particulates, PM10 (particles smaller than 10 microns in diameter), nitrogen oxides, carbon monoxide, and lead. Additional modeling is being conducted on metal deposition from the proposed facility. The primary focus has been on earth moving, mining, and blasting activities. Additional consideration has been given to the potential for dust from the tailings ponds. No modeling of metal dust blowing from the hopper cars is being conducted because the concentrates would be moist and the cars would be covered.

The modeling is focused on the access road, rail spur to the proposed site and the proposed activities at the mine/mill. If the project is constructed, there would be additional hydrocarbons released from cars and trucks in the area. The number of additional vehicle miles and truck traffic, however, is not considered significant in relation to the existing and anticipated growth in highway traffic occurring from other uses.

Public Concerns Regarding the Proposed Crandon Mine & DNR Responses

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

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

June 27, 1997

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LIST OF ACRONYMS AND ABBREVIATIONS

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

Introduction

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

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

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

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

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

The Ore Body

1.

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

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

2.

Q: What percentage of the ore body is mercury?

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

Monitoring

3.

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

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

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

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

4.

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

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

Water quality

5.

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

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

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

6.

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

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

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

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

7.

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

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

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

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

8.

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

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

9.

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

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

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

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

Groundwater Drawdown and Mitigation

10.

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

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

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

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

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

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

11.

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

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

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

12.

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

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

Risk Assessment

13.

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

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

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

The Roles of the DNR and the public

14.

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

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

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

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

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

15.

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

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

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

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

16.

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

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

17.

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

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

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

Making the Decision

18.

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

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

19.

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

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

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

20.

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

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

21.

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

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

Liability

22.

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

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

23.

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

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

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

Interbasin Transfer of Water

24.

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

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

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

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25.

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

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

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26.

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

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

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

27.

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

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

The Tailings Management Area

28.

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

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

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

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

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

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

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

29.

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

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

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

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

30.

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

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

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

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

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

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

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

is not required for construction and reclamation.

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

31.

Q: Have tailings ever been stopped from oxidizing?

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

32.

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

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

33.

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

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

34.

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

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

should we allow?

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

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

Drought conditions

35.

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

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

36.

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

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

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

37.

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

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

38.

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

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

Technological Improvements

39.

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

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

40.

Q: None of this technology has ever been tested!

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

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

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

41.

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

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

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

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

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

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

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

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

Air Quality

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

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

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

46.

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

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

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

47.

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

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

Wastewater Treatment

48.

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

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