

SULFIDE MINING REGULATION IN THE GREAT LAKES REGION

A comparative analysis of sulfide mining
regulation in Michigan, Minnesota,
Wisconsin and Ontario



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EXECUTIVE SUMMARY

PURPOSE

Sulfide mining is the mining of metals, such as copper, lead, nickel, and zinc when embedded in a sulfide ore body. The term “sulfide mining” refers to the relatively high sulfur content of the ores in which the metals are contained. In recent years, the region surrounding Lake Superior – portions of Minnesota, Wisconsin, Michigan, and Ontario – has increasingly drawn the interest of mineral extraction companies seeking to mine, process, and sell these metals.¹ While there are currently no extracting sulfide mines in Michigan, Wisconsin or Minnesota, there is a great deal of exploratory activity underway and one major mine under construction in Michigan. Ontario has several small sulfide-bearing mines, as well as intensive and broad exploration.

Acid Mine Drainage (“AMD”), a mixture of acidic water and metals produced when sulfide ores are exposed to air and water and then oxidize, is one of the most damaging and widespread pollutants associated with the mining industry throughout the world.² It degrades water quality and can harm plants and animals that live in or come into contact with that water, both because of the increased acidity itself and dissolved heavy metals like arsenic, lead, and mercury that may be present in the rocks and other materials the acidic water flows past or through. Those dissolved metals can then be carried downstream, poisoning the aquatic ecosystem and the plants and animals that come into contact with them. The most common and well-studied effects of AMD include the devastation of fish populations, the poisoning of farmland irrigated with affected waters, the reduction of species diversity in the aquatic ecosystem, and the potential for heavy metal bioaccumulation in fish which is toxic and even fatal to animals farther up the food chain, including humans.³ As of 1997, over 60 mines or mineral processing plants were on CERCLA’s National Priorities List, indicating contamination so severe that it requires federally-funded cleanup.⁴

¹ This region is the northern extension of the Mid-Continental Rift, a geologic formation marked by rich sources of iron, copper, and other metals. For more information, see United States Geological Survey “Potential for New Nickel-Copper Sulfide Deposits in the Lake Superior Region.” http://pubs.usgs.gov/info/mwni_cu/. Accessed December 12, 2011.

² Id.

³ Id.

⁴ Id.

Due to the immense amount of mineral exploration and known extensive mineralization across the upper Great Lakes basin, the National Wildlife Federation developed this report to:

1. Analyze statutes and regulations focused on sulfide mining, and their implementation, in Michigan, Wisconsin, Minnesota and Ontario,
2. Develop recommendations for each jurisdiction to improve their regulation of sulfide mining,
3. Assess the current involvement and need for additional federal involvement in sulfide mine permitting across the U.S. jurisdictions and Ontario, and
4. Examine whether and how the federal Clean Water Act provides a nexus for water quality regulation at sulfide mines.

One new sulfide mine is under construction in Michigan, one is in the permitting process and at least one application is expected to be submitted in 2012; exploration is on-going at numerous locations across the Upper Peninsula of Michigan and further mineral development is likely. In Wisconsin, exploration for minerals is on-going. In Minnesota, one project is in the permitting process while more are expected. In Ontario, sulfide mines are operating, but were not permitted under the current permitting regime.

Mineral development has become a top threat to the region's water quality, air quality and wildlife. Sulfide mining has, historically, been extremely detrimental to the areas in which it occurs, particularly weighing on water quality. If the region is poised to allow this type of mining, and it appears to be, protection of the region's natural resources must be the top priority. Mining is, in itself, an extractive industry and will take its toll.

Overall, the upper Great Lakes region is poorly positioned to adequately regulate an onslaught of new sulfide mining. In every jurisdiction, there are significant holes in the laws and their implementation. It is our hope that this report will be used by regulators, citizens, tribes, affected communities and industry to inform better legislation, practices, and overall regulation of sulfide mining.

SUMMARY OF FINDINGS

To assess the scope and effectiveness of sulfide mining regulation in the four jurisdictions (Michigan, Minnesota, Wisconsin and Ontario), the report analyzes five categories of information for each jurisdiction. The assessment categories are:

1. **Regulatory Scope:** What issues and actions does the jurisdiction regulate?
2. **Review Process:** How does the jurisdiction assess an application for permission to explore, mine, and remediate a sulfide mine?

3. **Enforcement:** How does the jurisdiction monitor mining and remediation activities and enforce the law and regulations?
4. **Program Resources:** Does the jurisdiction have the resources to monitor adequately?
5. **Reporting and Official Statements:** Does the jurisdiction require high-quality data from mine owners/operators and make data available to the public?

Taken together, the five categories provide a reasonably complete picture of how a jurisdiction regulates sulfide mining.

A. MICHIGAN

Category:	Overall Grade:
1. Regulatory Scope	Fair
2. Review Process	Poor
3. Enforcement	Poor
4. Program Resources	Poor
5. Reporting and Official Statements	Fair

Overall, Michigan lacks significant requirements for adequate regulation. Its laws are adequate, while acknowledging some major weaknesses like the lack of any siting requirements. Michigan's largest weaknesses are Review Process (lack of stringent review of permit applications) and Enforcement. The failure in these areas is fueled by the lack of adequate Program Resources.

Michigan's **regulatory structure** clearly recognizes the distinctive hazards posed by sulfide mining and sets an ambitious remediation goal for any mine permitted under it. The fact that Part 632 was enacted as an entirely new part of NREPA attests to the weight and political importance of this issue in Michigan. Noticeable holes in the regulatory scope include very limited permitting authority over exploratory activities, no set structure for coordinating the roles and interactions of the various departments and laws involved, and minimal consideration of siting criteria or buffer zones around a mine, or of standards for structural integrity of the mine. Finally, the environmental impact assessment that is the basis of the state's permitting decision is compiled by the applicant, not independently by the state or a state contractor.

The application **review process** is similarly marked by a lack of detailed standards for evaluating applications. While Michigan has developed an informal way of coordinating application review among various agencies and gives sufficient opportunities for public involvement and notification throughout the application review, it has come under sharp criticism for failing to follow its own regulations and experts' guidance in reviewing a major permit application. There is also very little opportunity given for local governments and tribes affected by a proposed operation to have their concerns addressed in the permitting process.

The law empowers Michigan's DEQ with a good deal of **enforcement** authority, for example to order immediate stops in operations violating any law or permit condition, and to take grievances to the courts for civil or criminal sanctions against a violating mine operator. However, these enforcement mechanisms do not allow much room for public involvement. The law permits, but does not require, DEQ to conduct regular and independent inspections of mine operations or reclamation activities.

The **program resources** available for the sulfide mining program are very likely not sufficient to fund the work required by the regulations. The application fee is remarkably low compared to comparable fees in the other jurisdictions, and the financial assurance mechanisms are written in a way that might leave the state paying the bill for an unexpected or catastrophic cleanup.

Finally, Michigan’s requirements for **reporting and official statements** are admirable in the total access provided to the public. However, consistent with the general theme throughout Michigan’s evaluation, there is a lack of specificity and objectivity in the reporting requirements. Most monitoring is done by the permittee and the state does not have standards in place for evaluating the integrity of that monitoring or for performing its own inspections and monitoring reports.

B. MINNESOTA

Category:	Overall Grade:
1. Regulatory Scope	Fair
2. Review Process	Fair
3. Enforcement	Fair
4. Program Resources	Fair
5. Reporting and Official Statements	Fair

Overall, Minnesota’s laws and implementation structure needs improvements in all areas. The law is adequate, but economic considerations appear to be a growing force resulting in legislative and policy changes designed not for environmental protections, but economic development.

As in Michigan, Minnesota’s nonferrous metallic mining regulations are set apart from its ferrous mining regulations, attesting to the state’s recognition of the special potential hazards of sulfide mines. The **regulatory scope** of Minnesota’s program is remarkably broad and detailed, and many of its regulations can serve as models of technical specifications aimed at protecting the environment and especially water quality. Minnesota takes special pains to protect its wetlands’ integrity, and generally places great emphasis on appropriate siting of potential mines to cause the least environmental disturbance possible. At the same time, however, Minnesota’s overarching mining policy includes both environmental and economic goals and the environmental reclamation standard is therefore tempered by economic considerations.

Minnesota’s permit **review process** requires a high level of standard technical detail to be provided by permit applicants, and also provides good opportunities for public participation through the environmental analysis stage of permit review. However, in contrast to the level of detail required in the application itself, the rules fail to provide clear and universal standards for permit approval or denial. Also, public participation is not encouraged in a meaningful way outside of the environmental analysis process. In the last year, the state made a major change to its policy of not allowing state approvals or permits to be granted to a project that has not yet completed environmental review, by carving out an exception to an economic development board that wished to loan funds to a proposed sulfide mine for land acquisition. This move drew sharp public criticism and signaled to many that the state values economic development over environmental concerns in the mining context.

The **enforcement** mechanisms of Minnesota’s nonferrous mining regulations provide the DNR with ample opportunities to stop work and, notably, to directly assess civil penalties (without a court order) against a permittee who violates the statutes, rule, or mining permit. However, while DNR is permitted to inspect permitted operations at any time, it has no mandate to do so in a regular fashion. Minnesota set a high bar on citizen standing to intervene and participate in enforcement actions, and given some of its recent policy changes (noted above), it has facilitated an atmosphere somewhat hostile to citizen and specifically environmentalist involvement. Whether and how DNR will in fact utilize its enforcement powers remains to be seen.

Minnesota’s **program resources** are funded by fairly weighty permit application fees and annual extraction fees, but staffing shortfalls and time constraints placed on application review might weaken the program’s effectiveness in the near future. The financial assurance mechanisms, however, successfully ensure that the permittee will be held responsible for funding a cleanup operation either during or after mining operations and reclamation.

Finally, the **reporting and official statements** requirements do not provide a great deal of detail, as follows from the generally weak monitoring framework. All information is, however, reviewable by the public.

C. WISCONSIN

Category:	Overall Grade:
1. Regulatory Scope	Fair
2. Review Process	Fair
3. Enforcement	Good
4. Program Resources	Fair
5. Reporting and Official Statements	Good

Wisconsin is positioned fairly well to regulate new sulfide mines. While the law is only “fair,” Enforcement is good and the state’s atmosphere and engaged citizen base insists on high-quality laws and their implementation.

Wisconsin’s sulfide mining law has perhaps the greatest **regulatory scope** of any of the U.S. jurisdictions surveyed, providing detailed standards for permit applications and review in all phases of mining, from exploratory activities through reclamation. Notably, state agencies are charged with the essential task of completing the environmental review for the project in the application phase, rather than the permittee. Special attention is paid to siting criteria and water quality, and the financial assurance mechanisms are written to ensure that any necessary cleanup will be fully funded by the permittee. However, as in Minnesota, the reclamation standard and overall policy of the program is aimed not merely at environmental protection, but includes economic growth as a balancing factor.

The **application review** process in Wisconsin is regulated by highly technical requirements, both for the applicant’s submission and for the state’s review and decision-making process. The review process is further strengthened by the “prove-it-first” requirement and by the state’s retention of authority to investigate and prepare an independent environmental analysis, rather than a reliance on an applicant-provided analysis. Public participation is also a central

feature of the review process and is encouraged through multiple opportunities for comment and protest in formal hearings. The process could be improved by allowing for more input and consideration of tribal and local government concerns.

The **enforcement** authority granted to Wisconsin’s DNR and to the public is the most extensive of any jurisdiction surveyed. It is marked not only by multiple opportunities and mandates for state enforcement actions, but also by open access for citizen participation in state enforcement actions and even direct citizen lawsuits against violators of the mining law. The one deficiency in this assessment category is the lack of a systematic monitoring scheme for the state to independently inspect and evaluate mining and reclamation activities.

Wisconsin’s **program resources** are reasonably funded by direct billing of program costs to applicants in the application phase, but there are no such mechanisms in place to fund enforcement or monitoring activities. Financial assurance mechanisms may be subject to claims by a permittee’s creditors. The potential shortfalls created by weak funding mechanisms could endanger the proper functioning of the regulatory scheme.

The requirements for **reporting and official statements** are relatively well-developed in Wisconsin, and as in all U.S. jurisdictions, all data and reports are fully publicly accessible.

D. ONTARIO

Category:	Overall Grade:
1. Regulatory Scope	Fair/Poor
2. Review Process	Poor
3. Enforcement	Fair
4. Program Resources	Poor
5. Reporting and Official Statements	Fair

Ontario is in dire need of improving its laws (underway) and review processes. Of the upper Great Lakes region, Ontario is far and away the least equipped jurisdiction to regulate and facilitate public involvement in the establishment of new mines.

Ontario’s **regulatory structure** does not require that a permit be obtained from the Ministry of Northern Development and Mines in order to commence mining operations. A mine is subject to limited environmental assessment (federally and/or provincially), though the disposition of the public resources is currently exempt from Ontario’s *Environmental Assessment Act*. Prior to operations commencing, a detailed closure plan must be submitted to the Ministry of Northern Development and Mines. Closure plans must comply with the Mine Rehabilitation Code, which has detailed requirements related specifically to sulfide mining. As well, recent amendments to Ontario’s *Mining Act* will provide additional regulatory structure once supporting regulations are developed. Approvals may also be required pursuant to environmental laws administered by the Ontario Ministry of the Environment and Ministry of Natural Resources and the federal Department of Fisheries and Oceans.

As there is no mining permit approval, there is no formal **review process**. In particular, although a closure plan is mandated, the Ministry of Northern Development and Mines does not have the authority to approve/reject the closure plan. There are review processes required for environmental assessments and for approvals for activities related to mining; however, materials

submitted to the approving authority are not generally made available to the public. There is some informal coordination among approval authorities when assessing proposed projects; however, cooperation between the federal and provincial government on environmental assessments is voluntary. First Nations have limited ability to influence the review process.

Ontario's **enforcement** authority is limited to those approvals that are granted for activities related to mining. Under Ontario's *Environmental Bill of Rights*, residents of Ontario are given some ability to participate in government decision making and the enforcement of any resulting approvals. Barriers to participation include difficulties in accessing information and adverse cost consequences of litigation. There are no provincial funding mechanisms that enable public participation.

The **program resources** available are very likely not sufficient to fund the work required for the various components related to sulfide mining in Ontario. Any permit application fees are not dedicated to use by the mining regulatory body and although civil penalties are available in Ontario, they do not exist within the *Mining Act*. Financial assurance can be provided in forms that are safe from creditors, though this is not a requirement for all of the mines.

Finally, information requirements for **reporting and official statements** both federally and provincially are of high quality. However, public access to the information is almost nonexistent. Accessibility to provincial datasets is better than is available federally, though the public release of information relevant to mining is subject to extensive lags.

SUMMARY OF RECOMMENDATIONS

A number of recommendations are common for each of the U.S. jurisdictions:

1. There should be a formal, standard method set forth in the law to coordinate the efforts of the various agencies responsible for different aspects of permitting, monitoring, and enforcement of a mining project.
2. State-conducted independent monitoring should be conducted regularly and systematically at any active mine and reclamation site, including in the post-closure phase, and should be funded by the permittee. Leaving this essential task to the permittee is unacceptable. DEQ should be required, not just empowered, to take immediate action to stop and/or remediate any problem found.
3. Affected tribes should have meaningful participation in permit decisions and monitoring, as equal partners.
4. Mine plans should include non-environmental goals and standards such as workers' safety, long-term viability of the mine (prohibiting high-grading), economic plans for communities' long-term health, reasonable royalties, past performance of applicant and community priorities as expressed in Master Plans, zoning, etc.

5. Public funds must not be committed to financing or assisting any project that has not completed and passed environmental review. This should be a matter of law with no exceptions.
6. Civil penalties and fees assessed for noncompliance should be dedicated to return to the nonferrous metallic mining program.

The patterns in these common and in state-specific recommendations, is that greater consistency across the jurisdictions is needed. Federal involvement, as well as state-level regulation, is inconsistent across the jurisdictions; correcting that factor alone would likely increase resource protection significantly.

Some of the recommendation areas apply to Ontario as well, particularly the need for tribal governments to have meaningful engagement in permitting decisions. In Ontario, however, permitting for mines is essentially non-existent, so establishment of a permitting program is the top recommendation. While there is some legislative movement toward that, its timing and efficacy are unknown.

An unfortunate similarity between the United States jurisdictions and Ontario is that in all areas, it is now legal for mine waste to be dumped into surface waters. This is a loophole whose closing should receive top-billing from the United States and Canada.

PART I: INTRODUCTION AND SUMMARY

1. PURPOSE

Sulfide Mining in the Great Lakes Region

The Great Lakes are the largest surface freshwater system on Earth, accounting for about 84% of North America's and over 20% of the world's surface fresh water supply. In an era of increasing global demand for fresh water, the purity and availability of the Great Lakes' water has not just local but international significance. Despite their great volume, the lakes are extremely vulnerable to contamination from air- and water-borne pollutants, including agricultural runoff, invasive species, industrial wastes, and so on.⁵ Federal and state governments have coordinated their efforts to control and eliminate such pollution. However, there is a new threat to the lakes that is not managed under any coordinated system, and that will impact not only the water but also the land, wildlife, and people of the region. This is sulfide mining.

Sulfide mining is the mining of metals, such as copper, lead, nickel, and zinc, which are embedded in a sulfide ore body. The term "sulfide mining" does not refer to how the metals are mined or processed, but simply to the relatively high sulfur content of the ores in which the metals are contained.⁶ In recent years, the region surrounding Lake Superior – portions of Minnesota, Wisconsin, Michigan, and Ontario – has increasingly drawn the interest of mineral extraction companies seeking to mine, process, and sell these metals.⁷ While there are currently no extracting sulfide mines in Michigan, Wisconsin or Minnesota, there is a great deal of exploratory activity underway and one major mine under construction in Michigan. Ontario has several small sulfide-bearing mines, as well as intensive and broad exploration.

It is important at the outset to clarify some common confusion surrounding sulfide mining and to distinguish it from other traditional forms of mining in the region. While iron mining has a long history and still continues in the upper Midwest, it does not involve the mining or disturbance of sulfide ores. Iron is generally mined out of an iron oxide ore, not an iron sulfide ore, and iron oxide ores do not degrade and toxify the same way that sulfide ores do.⁸ In Michigan, Minnesota, and Wisconsin, nearly all of the high-grade iron ore has already been extracted, so the most common type of iron mining is the extraction of a lower-grade iron oxide known as taconite. If located in an area free of sulfide minerals, taconite mining does not have

⁵ Environmental Protection Agency, Region 5, "Great Lakes: Basic Information." <http://www.epa.gov/greatlakes/basicinfo.html>. Accessed December 17, 2011.

⁶ The term "sulfide mining" is not a technical term but a colloquialism developed and used mainly in the U.S.

⁷ This region is the northern extension of the Mid-Continental Rift, a geologic formation marked by rich sources of iron, copper, and other metals. For more information, see United States Geological Survey "Potential for New Nickel-Copper Sulfide Deposits in the Lake Superior Region." USGS Information Handout. http://pubs.usgs.gov/info/mwني_cu/. Accessed December 12, 2011.

⁸ This issue can be confusing because iron sulfides (e.g., pyrite, iron disulfide) are among the most prevalent of sulfide ores, so they are often the leading causes of acid mine drainage ("AMD") in a sulfide mining operation. This does not, however, mean that iron mines are always associated with sulfurous AMD. In fact, the presence of sulfur in an iron ore is considered a weakening factor, rendering the ore undesirable for iron extraction. Iron sulfides are simply a common byproduct of the extraction of other metals from sulfide ore bodies.

the same toxic effects as the sulfide mining that is the subject of this report.⁹ While iron mining is still a contentious issue in the region for other reasons, its effects and hazards must be distinguished from sulfide mining. Most jurisdictions recognize this difference and regulate iron mining and sulfide mining under different rules and laws.

Potential Hazards of Sulfide Mining

When sulfide minerals are exposed to water and air, they oxidize and generate sulfuric acid that can leach into the surrounding environment. In undisturbed natural systems, this oxidation process occurs at extremely slow rates over geologic time periods, due to the natural weathering and erosion of land. In this situation, the amount of acidity created is generally small, or buffered by other naturally-occurring compounds, so it does not upset the natural pH balance of surrounding waters beyond a sustainable range.¹⁰

But when sulfide minerals are disturbed by road cuts or mining activities, the oxidation process is multiplied far beyond what occurs through natural erosion. This unnaturally expedited oxidation reaction generates acid in quantities that cannot be offset or buffered by other materials in the host rock and water. The acidic discharge and metal-laden leachate from mining activities is known as acid mine drainage (“AMD”).¹¹ Further, since mine tailings and waste rock have greater surface area than undisturbed geologic material due to their small grain size, they are more prone to generating AMD.¹² The surrounding environment can often not counteract the resulting acidic conditions to maintain homeostasis.

AMD is one of the most damaging and widespread pollutants associated with the mining industry throughout the world.¹³ It degrades water quality and can harm plants and animals that live in or come into contact with that water, both because of the increased acidity itself and dissolved heavy metals such as arsenic, lead, and mercury that may be present in the rocks and other materials the acidic water flows past or through. Those dissolved metals can then be carried downstream, poisoning the aquatic ecosystem and the plants and animals that come into contact

⁹ A taconite mine that disturbs sulfide ore bodies, on the other hand, would present the same hazards as non-ferrous metallic mines. The Gogebic Taconite mine under development in northern Wisconsin is an example of a taconite mine that may disturb sulfide minerals.

¹⁰S.R. Jennings, D.R. Neuman, and P.S. Blicher (2008). “Acid Mine Drainage and Effects on Fish Health and Ecology: A Review”. Reclamation Research Group Publication, Bozeman, MT for U.S. Fish and Wildlife Service, Anorage Field Office. Available online at http://www.pebblescience.org/pdfs/Final_Lit_Review_AMD.pdf. Accessed December 12, 2011. See also Jane Earle and Thomas Callaghan (1994). “Impacts of Mine Drainage on Aquatic Life, Water Uses, and Man-Made Structures”, Ch. 4 of *Coal Mine Drainage Prediction and Pollution Prevention in Pennsylvania*, Pennsylvania Department of Environmental Protection, (Harrisburg, PA). Available online at <http://www.dep.state.pa.us/dep/deputate/minres/districts/cmdp/chap04.html>. Accessed December 17, 2011. And see U.S. Environmental Protection Agency (1997), “Risks Posed by Beville Wastes”. Available online at <http://www.epa.gov/osw/hazard/tsd/ldr/mine/risks.pdf>. Accessed December 12, 2011.

¹¹ The term Acid Rock Drainage (“ARD”) refers to the same substance and chemical reaction as Acid Mine Drainage (“AMD”). However, since “ARD” does not refer to mining as the primary cause of the discharge, it is more appropriately used where acid leachate occurs naturally without human intervention. Mining advocates sometimes claim that “AMD” is a pejorative term compared with “ARD”, but since the acidic leachate associated with man-made disturbances is the subject of this report, the term AMD is a more precise label for the topic at hand, and will be used throughout this report, unless “Acid Rock Drainage/ARD” is explicitly contained in a statute or regulation.

¹² Supra note 6.

¹³ Id.

with them. The most common and well-studied effects of AMD include the devastation of fish populations, the poisoning of farmland irrigated with affected waters, the reduction of species diversity in the aquatic ecosystem, and the potential for heavy metal bioaccumulation in fish which is toxic and even fatal to animals farther up the food chain, including humans.¹⁴ As of 1997, over 60 mines or mineral processing plants were on CERCLA's National Priorities List, indicating contamination so severe that it requires federally-funded cleanup.¹⁵

It is important to note that the environmental effects caused by a given mine depend on site-specific circumstances, including but not limited to:

- the quality and type and amount of ore being disturbed,
- the types of protective mechanisms used to diminish disturbance and isolate AMD from the surrounding environment,¹⁶
- the climatic features of the area,
- the hydrology of the surrounding area (i.e., the potential rate and range of dispersal) and
- the presence of buffering compounds in the surrounding rock and water that may offset the increased acidity to some degree.

The risks of AMD are therefore highly site-specific and depend both on the mining operation and the natural environment.

Lack of Federal Regulation

In 1980, Congress excluded mining wastes from federal regulation under the Resource Conservation and Recovery Act. Since that time, EPA has studied the issue of mining wastes extensively, developed technical guidance for state regulators to improve their programs, and given grants to some states to improve mine regulation programs. Despite the EPA's finding that mine wastes pose significant threats to the environment and human health, it has not regulated mining itself or mine waste management and instead has left regulation to the states.¹⁷

The federal government is still involved in other aspects of the regulation of mining, for example when mine wastes cause significant environmental damage invoking a CERCLA cleanup, when the mine requires the lease or purchase of federal land, or when a Clean Water Act ("CWA") permit is required.¹⁸ However, the federal government's general lack of oversight and permitting authority over extraction, beneficiation, and normal cleanup activities leaves the states largely in charge of setting their own permitting, monitoring, and cleanup standards for sulfide mining.

Are State Regulations Adequate to Protect Against Hazards?

¹⁴ Id.

¹⁵ Id.

¹⁶ The technology and methods needed to predict and counteract AMD are still under development. The primary group working on the problem is a joint government/industry group, the Acid Drainage Technology Initiative, which publishes research and guidance on the best available technologies. See <http://www.techtransfer.osmre.gov/NTTMainSite/Initiatives/ADTI/adti.shtm>.

¹⁷ For a brief background on EPA's history and position on this issue, see U.S. Environmental Protection Agency (1997), *supra* note 6.

¹⁸ Id.

Given the lack of federal oversight and standards, the question becomes: is a given state's regulation of sulfide mining adequate to protect environmental and human health? Generally, the answer is "no." This report provides a baseline assessment of how sulfide mining is currently regulated throughout the northern Great Lakes region, specifically Wisconsin, Minnesota, Michigan, and Ontario, and can serve as the basis for formulating responsible and informed region-wide strategies to address the potential hazards of sulfide mining. To that end, the report describes each jurisdiction's laws and regulations, including the past and present effectiveness of their implementation and enforcement. It also offers suggestions for how the regulatory systems might be improved to provide adequate environmental protections where needed.

2. HISTORY & REGULATORY FRAMEWORK

In the United States, the federal government leaves the regulation of sulfide mining and reclamation largely in the hands of the states, as discussed above. In the states surveyed in this project, a mining-specific permit from a state environmental agency is the primary permit required to operate a mine. Other permits such as a National Pollutant Discharge Elimination System (“NPDES”) permit, Clean Air Act (“CAA”) permit, and others are considered secondary requirements included in some way within or tertiary to the mining permit.

Though this report focuses on mining-specific regulations, general water quality regulations and laws are also central to the proper regulation of sulfide mining. Given the likelihood of discharges to water bodies from sulfide mining operations, the federal CWA applies, or should apply, to all or nearly all mining projects. However, some states have been delegated authority to administer the CWA, so its implementation differs to some extent from state to state. These differences are discussed in the “Water Quality Regulation Report: Michigan, Minnesota, and Wisconsin” (hereinafter “Water Quality Report”) attached to this report at Appendix A.

A. MICHIGAN

In Michigan, the permitting, operation and reclamation of sulfide mines is regulated primarily by the Department of Environmental Quality (“DEQ”) under Part 632 of Michigan’s Natural Resources and Environmental Protection Act (“NREPA”), MCL §324.63201 to 324.63223, and its implementing rules, R 425.101 to 425.602. Applicants must submit an environmental assessment, mining plan and reclamation plan to DEQ for review and approval before being granted a permit to mine.

Part 632 was drafted in a collaborative process involving several environmental nonprofit organizations, state regulators, citizens and local government and industry representatives, was enacted by a unanimous vote in both the House and Senate in 2004, and has not yet undergone amendment. Prior to 2004, Michigan regulated iron mining, but had no specific provisions for non-ferrous metallic mining.¹⁹ A desire to effectively regulate the proposed Rio Tinto/Kennecott Mining Company’s proposed “Eagle” mine in the Upper Peninsula, and potential other sulfide mining projects, was the impetus behind enactment of the legislation. Part 632 states “[t]he special concerns surrounding nonferrous metallic mineral mining warrant additional regulatory measures beyond those applied to the current iron mining operations.” MCL § 324.63202(d). Specifically, the purpose of adding Part 632 was to add safeguards to the existing mining law to prevent acid mine drainage that can occur incident to mining activities involving sulfide deposits:

Nonferrous metallic sulfide deposits are different from the iron oxide ore deposits currently being mined in Michigan in that the sulfide minerals may react, when exposed to air and water, to form acid rock drainage. If the mineral products and waste materials associated with nonferrous metallic sulfide mining operations are not properly managed and controlled, they can cause significant damage to the

¹⁹ Part 631 of NREPA applies to ferrous ore mining only.

environment, impact human health, and degrade the quality of life of the impacted community.

MCL § 324.63202(c). While recognizing the potential economic significance of sulfide mining to Michigan's economy, the statute states that sulfide mining "shall occur only under conditions that assure that the environment, natural resources, and public health and welfare are adequately protected." MCL § 324.63202(e).

To date, Part 632 has been applied through final permitting to only a single project, the Eagle Mine, which is currently under construction.²⁰ However, litigation and public protests against the Eagle project have cast doubt on the effectiveness of Part 632, its implementing regulations, and the state's permitting agencies. If sufficient safeguards and environmental review are not carried out in accordance with the law, the mine could potentially contaminate a large area, including a protected National Wilderness Area and numerous watersheds including the Huron, Yellow Dog, Dead, Mulligan, and Salmon Trout.²¹ At this point, the legal challenge to the Eagle mine's permits is on appeal in state court, but construction continues apace.

B. MINNESOTA

In Minnesota, permitting, operation and reclamation of sulfide mining is regulated by the Department of Natural Resources, under the authority of Minn. Stat. §§ 93.44-93.51 and their implementing regulations, Minn. Rules Ch. 6132 ("Nonferrous Metallic Mineral Mineland Reclamation Rules"). The Rules were adopted in 1992 and as their name suggests, are specific to the regulation of only non-ferrous metallic mining. The state's policy regarding reclamation focuses on both environmental protection and the economic value of mining to the state. DNR's stated objective is "... that mining be conducted in a manner that will reduce impacts to the extent practicable, mitigate unavoidable impacts, and ensure that the mining area is left in a condition that protects natural resources and minimizes to the extent practicable the need for maintenance." Rule 6132.0200; and see Minn. Stat. §93.44.

At the same time, the law authorizes DNR to lease state lands for sulfide mining activities, stating that "[t]he business of mining, producing, or beneficiating nonferrous metallic minerals is declared to be in the public interest and necessary to the public welfare, and the use of property therefor is declared to be a public use and purpose." Minn. Stat. §93.43. A 2004 report on the future of nonferrous metallic mining suggested that the state should assist developers through better public access to land and mineral ownership records, opening more state land to mineral leasing, and financing geologic and geophysical mapping.²² Further, the state has come under significant criticism recently for a number of pro-development decisions and policy changes. The 2011 legislature amended the permitting and environmental review laws to "streamline" the process, including a provision to allow applicants to write their own proposed EIS instead of having DNR write it, and tightening the deadlines for citizen intervention and for permitting decisions.²³ In the same session, the legislature created an exception for a state

²⁰ In February 2012, MDEQ announced preliminary approval and draft permit conditions for the proposed Orvana Copperwood Mine near White Pine, Michigan.

²¹ Scott Schulz, (2006). "Between a Rock and a Hard Place". *Vermont Journal of Environmental Law* (May 2006), at 16.

²² State of Minnesota, "Governor's Committee on Minnesota's Mining Future: Final Report", (September 2004). Available online at <http://www.leg.state.mn.us/docs/2004/other/040639.pdf>. Accessed December 4, 2011.

²³ For more information, see Elanne Palcich, "New Law's Effect: Minnesota Streamlines Pollution." *Minnesota Pos*, March 11, 2011. Available online at

economic development board to commit state monies to private projects prior to environmental review being completed. This exception was applied retroactively to the Board's \$4 million loan to a sulfide mine project (Polymet's NorthMet project) that has not yet completed its environmental review or acquired a permit to mine.

Minnesota has never permitted a sulfide mine to operate, but is currently reviewing the application of Polymet's NorthMet project, which has incurred a great deal of public criticism. Also, there is significant exploratory activity underway, particularly in the northeast corner of the state in the Duluth Complex, which is part of the mid-continental rift system. The Duluth Complex also underlies most of the eastern part of the Superior National Forest and the Boundary Waters Canoe Area Wilderness, a pristine and protected area that is the most-visited wilderness area in the nation. The proximity of Minnesota's potential sulfide mines to these protected water resources has heightened the concern over the efficacy of state mining regulations.

C. WISCONSIN

In Wisconsin, nonferrous metallic mining is primarily regulated by the Department of Natural Resources ("DNR") under the authority of Wis. Stat. Chapter 293 and its implementing regulations, Adm. Code Rules NR 130, 131, 132, 182. These laws regulate both ferrous and nonferrous metallic mining in the same manner.²⁴ The applicant must submit a mining plan and reclamation plan to DNR to obtain a permit, and DNR itself must do an environmental impact study (EIS) for the project prior to permit approval. Wis. Stat. § 293.37(2)(a-b) and § 293.39.

However, sulfide mining is set apart from other types of metallic mining by a 1997 amendment placing an additional application requirement for sulfide mining permits.²⁵ Wis. Stat. §293.50. A sulfide mining operation can be approved only if the applicant submits evidence that sulfide mining can in fact be done without adverse environmental impacts. Specifically, the applicant must find a sulfide mine(s) with net acid generating potential in the U.S. or Canada which has been operating for at least 10 years and one which has been closed for at least 10 years without polluting groundwater or surface water from acid drainage at the tailings or mine site or from the release of heavy metals. Wis. Stat. §293.50(2). "Pollution" in this part means any degradation of water quality that has resulted in the violation of an environmental law as determined in a legal proceeding, as evidenced by any penalty assessed, decision rendered, or stipulated agreement, etc.

http://www.minnpost.com/community_voices/2011/03/11/26518/new_laws_effect_minnesota_streamlines_pollution. Accessed December 12, 2011.

²⁴ There are currently a number of amendments to Wisconsin's mining law under legislative consideration. However, these amendments apply only to ferrous mining and should not, in theory, affect non-ferrous sulfide mine operations. However, as mentioned above, taconite mining that disturbs sulfide ore bodies can cause AMD just as non-ferrous metallic mining can. The proposed amendments streamline the process for ferrous mining without regard to the geologic context of the proposed project and therefore pose a threat of AMD. The Penokee project (which was the impetus behind this legislation) may unfortunately provide a convincing example of how taconite mining can cause AMD. While analysis of the ferrous mining amendments is beyond the scope of this report, the dangers posed by that and similar legislation cannot be ignored.

²⁵ While this amendment is called a "moratorium," it is applied and may be lifted on a per-project basis. In practice, therefore it operates simply as an additional application requirement rather than a blanket "moratorium."

As of this date, there have been no successful applications for a sulfide mine in Wisconsin under the current law and none are currently pending. However, DNR's handling of the Nicolet Minerals Company's application to mine near Crandon (withdrawn in 2003) and the operation and reclamation of the Flambeau mine near Ladysmith provide some insight into how the state regulates nonferrous mining and reclamation activities and, for some, raises doubts about whether the law will provide adequate environmental protection for future sulfide mines. As is the case throughout the region, there is significant exploratory activity in the state for potential new sulfide mines.

D. ONTARIO

Canada's mining regulations are as varied as the impacts mining has created. Given that mining engages consideration of economic, social, and environmental policy, one must look to the varied Constitutional powers for the authority to regulate mining activity on the Canadian side of the Great Lakes basin.

The management of fisheries, heavy metal and other contamination, general land use and planning, shipping and infrastructure issues, environmental assessment, impacts to Aboriginal peoples, and the regulation of the physical mines themselves come under the various powers of two levels of government: the province of Ontario and the federal government. Canada's *Constitution Act, 1867*, divides powers over resources and the impacts of mining activities between provincial and federal governments. Three sections of the *Constitution Act, 1867*, (sections 91, 92 and 92A) assign authority over mining activities as follows:

- a. Regulation of staking of claims, exploration, mine leases is predominately provincial (s.92A).
- b. Land use planning to decide where mining can happen is provincial (ss.92A(1)).
- c. Regulation of impacts on fisheries can be both levels of government but is largely federal (ss.91(12)).
- d. Regulation of impacts to navigation and shipping caused by mine development is federal (s.91(10)).
- e. Regulation of water, land-based and air pollution from mining can be both levels of government – federal criminal law power (s.91(27)) or provincial property, civil rights and natural resource powers (ss.92(13), 92A(1)).
- f. Consultation and accommodation of Aboriginal interests can be one or both levels, again depending on whether the issue is impacts to "Indian lands" or impacts to resources relied upon to exercise Aboriginal rights (ss.91(24)) and also section 35(1) of the *Constitution Act, 1982*, which requires all levels of government to consult and accommodate Aboriginal interests that may be impacted by government decisions that may impact that interest.
- g. Impacts on species at risk can be one or both levels of government (ss.91 and 92).

In Ontario specifically, the law regulating mining is older than the province itself, dating back at least 130 years. The law was originally used as a means to settle Ontario and assert control of lands through regulation.

However, recent land use conflicts between First Nations and exploration companies resulted in major amendments to the law in 2009 (*Mining Amendment Act - Bill 173*) to address potentially unconstitutional provisions of Ontario's *Mining Act*. The *Mining Act* currently allows

unfettered access to lands for staking and exploration without meaningful consultation with Aboriginal peoples and accommodation of their interests. Regulations now under development will require permitting for exploration and mines and an associated aboriginal consultation processes. However, it remains to be seen how rigorous the assessment process will be in terms of ensuring that environmental protection is prioritized or even considered previous to such permits being issued.

In Ontario, the permitting, operation and reclamation of sulfide mines is primarily the responsibility of the provincial Ministry of Northern Development and Mines under the authority of the *Mining Act*. Environmental assessment is required only if “triggered”; federally, this often occurs due to the requirement for a federal permit under the *Fisheries Act* or the *Navigable Waters Protection Act*. Provincially, an environmental assessment has been mandated for the disposition of public (a.k.a. Crown) resources since 1981; however, mining dispositions have been and continue to be exempted, pending the approval of a proposed environmental assessment process. Federally, environmental assessments have generally been limited to the aspects of a project that fall squarely under federal jurisdiction while, provincially, the various ministries responsible for environmental assessments limit the assessments to aspects of the project within their mandates. It is perhaps unsurprising therefore that the Ministry of Northern Development and Mines intends to assess only the impacts of the disposition of the resources (the mine pit, for example) and the rehabilitation of the public lands. Also, the vast majority of environmental assessments are at the lowest level of scrutiny (e.g., “Screening Assessment” federally), which does not require extensive public engagement. Comprehensive assessment of all aspects of a project only occurs in rare cases where the federal and provincial governments voluntarily agree to have the full project assessed by an independent third party called a Joint Review Panel (“JRP”). The first ever JRP for an Ontario mine has been commenced to assess the proposed Marathon Platinum Group Metals and Copper Mine Project (August 2011, Environmental Assessment Registry Number 10-05-54755).

Sulfide mining, in addition to approval from the Ministry of Northern Development and Mines, often requires both federal and provincial permits. As mentioned above, federally, permits are often required under the *Fisheries Act* or the *Navigable Waters Protection Act*. Provincially, approval is needed to develop infrastructure on public lands and for water pumping and discharges (Ministry of the Environment).

3. METHODOLOGY

Research Methods

The information for this report was gleaned from three sources:

1. Statutes, rules, and other legal resources
2. Interviews with government and non-government experts in the field of sulfide mining
3. Written materials by academic, government, industry and non-profit groups

The legal materials used were current up through the end of February 2012. The interviews were conducted by telephone in the period June 2011 – December 2011, and a list of interviewees can be found in the Reference section at the end of this report. Finally, the written materials consulted are cited throughout this report and re-printed in the endnotes.

NWF staff researched the U.S. jurisdictions (Michigan, Minnesota and Wisconsin) while Ecojustice Canada compiled the data pertaining to Ontario. The assessment of the jurisdictions' regulatory programs and performance was similarly divided between NWF and Ecojustice staff. River Network contributed the Water Quality Report, Appendix A. Final compilation and review of the report was conducted by NWF staff.

NWF acknowledges that this report was researched and written while NWF was involved in litigation opposing the Kennecott Eagle Mine project in Michigan. However, this report was in no way connected to that litigation and the primary research was conducted by staff entirely independent of that litigation. This report is intended as a tool for current and future policy work by government and private sector interests alike.

Assessment Methods

To assess the scope and effectiveness of sulfide mining regulation in the four jurisdictions (Michigan, Minnesota, Wisconsin and Ontario), the report analyzes five categories of information for each jurisdiction. The assessment categories are:

6. **Regulatory Scope:** What issues and actions does the jurisdiction regulate?
7. **Review Process:** How does the jurisdiction assess an application for permission to explore, mine, and remediate a sulfide mine?
8. **Enforcement:** How does the jurisdiction monitor mining and remediation activities and enforce the law and regulations?
9. **Program Resources:** Does the jurisdiction have the resources to monitor adequately?
10. **Reporting and Official Statements:** Does the jurisdiction require high-quality data from mine owners/operators and make data available to the public?

Taken together, the five categories provide a reasonably complete picture of how a jurisdiction regulates sulfide mining.

Within each assessment category, a panel of experts from each jurisdiction helped NWF develop a series of criteria or indicators that together show how the jurisdiction is performing in that area. These criteria are the “best case scenario” for how the experts consider a responsible,

comprehensive and protective sulfide mining regime would operate. There are 17 criteria for Regulatory Scope, 18 criteria for Review Process, 15 criteria for Enforcement, four criteria for Program Resources, and two criteria for Reporting and Official Statements. A jurisdiction fulfilling most or all of the criteria in a given assessment category would be considered ideal or successful in that category with little to no room for improvement, and will be graded as “good”. A jurisdiction failing to fulfill any or most of the criteria in a category, on the other hand, would be considered failing in that category and graded as “poor.” A jurisdiction in between these two extremes would be considered adequate, but with room for improvement, and graded as “fair.”

The criteria are narrative and do not lend themselves to an absolutely objective quantification. However, they can be assessed as either “YES,” (fulfilled) “SOME,” (partially fulfilled,) or “NO” (not fulfilled) for any given jurisdiction. It is important to note that for some criteria in some jurisdictions there is not enough information available to render a responsible assessment. For example, a state with no experience in regulating an active sulfide mine under its current regulatory regime could not be graded for its performance in implementing its enforcement policy on an active mine. Such criteria will not be considered fulfilled or unfulfilled but will be assigned an “N/A,” and will not be counted for or against the jurisdiction’s final categorical assessment.

Finally, it must be emphasized that these criteria and “grades” are not quantitative in nature and therefore the final assessment is to some degree subjective. The quantification of “yes,” “some” or “no” is a rough approximation, based on the set criteria, of how the jurisdiction performs in a particular category, and may provide direction or focus for what areas merit special attention or concern. However, the description and detail presented in the body of each section may be more important and informative for readers wishing to understand the mechanisms and issues behind the overall assessment.

Report Layout

The report is divided into five sections corresponding to each category. At the beginning of each category’s section, the report discusses the import of the category generally and introduces the criteria used to judge in that category. Moving one jurisdiction at a time, the report describes whether and how each criterion operates and establishes whether the criterion is fulfilled, partially fulfilled, or unfulfilled by the jurisdiction. Then, it considers whether the sum of the criteria in a category show that the jurisdiction is mostly or entirely succeeding, doing adequately, or mostly or entirely failing in that category. A jurisdiction that fulfills or mostly fulfills all or most of the criteria receives a “good” score, while one that mostly fails to fulfill most or all of the criteria will receive a “poor” score, and one falling more or less in the middle will receive a “fair” score. These summary scores and a brief narrative description and chart of the criteria can be found at the beginning of each jurisdiction’s section in each category.

Though this report focuses on direct mining regulation programs, the threat to water quality is clearly at the heart of the sulfide mining debate. Therefore, a brief comparative report on water quality regulation in the context of sulfide mining in Michigan, Minnesota, and Wisconsin is appended to this report at Appendix A. The Water Quality Report is referenced where pertinent throughout the report. In the Canadian context, the federal relevance is discussed in the narrative of this report rather than in a separate document.

4. SUMMARY OF FINDINGS

The following summarizes the “Assessment” section of the report, providing an overview of each jurisdiction’s performance. The information found by this study reveals a number of interesting similarities and differences between the jurisdictions surveyed. A summary table can be found at Appendix B to this report, showing side by side all the criteria scores and overall scores for each jurisdiction.

However, as noted above, their very different practical experiences with sulfide mining regulation make an apples-to-apples comparison impossible. It would not be fair, for example, to assess the experiences of states that have already permitted sulfide mines against states that have no practical experience. It is, therefore, not the intent of this report to rank the jurisdictions against each other, but rather to evaluate each jurisdiction against the set of objective criteria set out in each assessment category. At the same time, it is worth noting any areas where one jurisdiction may provide a model of a regulatory framework or implementation practice for the other jurisdictions. Those suggestions are made in the “Recommendations” section at the end of the report.

A. MICHIGAN

Category:	Overall Grade:
6. Regulatory Scope	Fair
7. Review Process	Poor
8. Enforcement	Poor
9. Program Resources	Poor
10. Reporting and Official Statements	Fair

Michigan’s **regulatory structure** clearly recognizes the distinctive hazards posed by sulfide mining and sets an ambitious remediation goal for any mine permitted under it. The fact that Part 632 was enacted as an entirely new part of NREPA attests to the weight and political importance of this issue in Michigan. The regulations aim to avoid the creation of AMD and set up financial assurance mechanisms to ensure that the permittee will be responsible for any cleanup costs both during operations and even after reclamation is complete. Beyond the lofty goal, however, there is a distinct lack of specificity in setting up standards for review of applications, monitoring, and best-practices for mining operations. There are also a few noticeable holes in the regulatory scope, for instance, there is very limited permitting authority over exploratory activities, no set structure for coordinating the roles and interactions of the various departments and laws involved, and minimal consideration of siting criteria or buffer zones around a mine, or of standards for structural integrity of the mine. Finally, the environmental impact assessment that is the basis of the state’s permitting decision is compiled by the applicant, not independently by the state or a state contractor.

The application **review process** is similarly marked by a lack of detailed standards for evaluating applications. While Michigan has developed an informal way of coordinating application review among various agencies and gives sufficient opportunities for public involvement and notification throughout the application review, it has come under sharp

criticism for failing to follow its own regulations and experts' guidance in reviewing a major permit application. There is also very little opportunity given for local governments and tribes affected by a proposed operation to have their concerns addressed in the permitting process.

The law empowers Michigan's DEQ with a good deal of **enforcement** authority, for example to order immediate stops in operations violating any law or permit condition, and to take grievances to the courts for civil or criminal sanctions against a violating mine operator. However, these enforcement mechanisms do not allow much room for public involvement, and the state's permit review process and approval of the Eagle mine has created an atmosphere of public mistrust and suspicion. The law permits, but does not require, DEQ to conduct regular and independent inspections of mine operations or reclamation activities. Whether and how DEQ will utilize its enforcement power during mining or reclamation operations remains to be seen, since the Eagle mine has not yet started operating. Nevertheless, the structure of enforcement authority and DEQ's experience thus far in enforcing the permit review procedures in regard to the Eagle mine indicate that Michigan's enforcement regime may not give a strong enough mandate to effectively regulate a sulfide mining operation.

The **program resources** available for the sulfide mining program are very likely not sufficient to fund the work required by the regulations. The application fee is remarkably low compared to comparable fees in the other jurisdictions, and the financial assurance mechanisms are written in a way that might leave the state paying the bill for an unexpected or catastrophic cleanup.

Finally, Michigan's requirements for **reporting and official statements** are admirable in the total access provided to the public. However, consistent with the general theme throughout Michigan's evaluation, there is a lack of specificity and objectivity in the reporting requirements. Most monitoring is done by the permittee and the state does not have standards in place for evaluating the integrity of that monitoring or for performing its own inspections and monitoring reports.

B. MINNESOTA

Category:	Overall Grade:
6. Regulatory Scope	Fair
7. Review Process	Fair
8. Enforcement	Fair
9. Program Resources	Fair
10. Reporting and Official Statements	Fair

As in Michigan, Minnesota's nonferrous metallic mining regulations are set apart from its ferrous mining regulations, attesting to the state's recognition of the special potential hazards of sulfide mines. The **regulatory scope** of Minnesota's program is remarkably broad and detailed, and many of its regulations (Minn. Rules, Ch. 6132) can serve as models of technical specifications aimed at protecting the environment and especially water quality. Minnesota takes special pains to protect its wetlands' integrity, and generally places great emphasis on appropriate siting of potential mines to cause the least environmental disturbance possible. At the same time, however, Minnesota's overarching mining policy includes both environmental and economic goals and the environmental reclamation standard is therefore tempered by economic considerations. Minnesota has also recently amended its law to allow permit applicants to

preclude a state environmental assessment of their projects by submitting their own self-produced assessments. To many, this step reduces the reliability of the environmental assessments that form the basis of the state’s mining permit application review.

Minnesota’s permit **review process** requires a high level of standard technical detail to be provided by permit applicants, and also provides good opportunities for public participation through the environmental analysis stage of permit review. However, in contrast to the level of detail required in the application itself, the rules fail to provide clear and universal standards for permit approval or denial. Also, public participation is not encouraged in a meaningful way outside of the environmental analysis process. In the last year, the state made a major change to its policy of not allowing state approvals or permits to be granted to a project that has not yet completed environmental review, by carving out an exception to an economic development board that wished to loan funds to a proposed sulfide mine for land acquisition. This move drew sharp public criticism and signaled to many that the state values economic development over environmental concerns in the mining context.

The **enforcement** mechanisms of Minnesota’s nonferrous mining regulations provide the DNR with ample opportunities to stop work and, notably, to directly assess civil penalties (without a court order) against a permittee who violates the statutes, rule, or mining permit. However, while DNR is permitted to inspect permitted operations at any time, it has no mandate to do so in a regular fashion. Minnesota set a high bar on citizen standing to intervene and participate in enforcement actions, and given some of its recent policy changes (noted above), it has facilitated an atmosphere somewhat hostile to citizen and specifically environmentalist involvement. Whether and how DNR will in fact utilize its enforcement powers remains to be seen.

Minnesota’s **program resources** are funded by fairly weighty permit application fees and annual extraction fees, but staffing shortfalls and time constraints placed on application review might weaken the program’s effectiveness in the near future. The financial assurance mechanisms, however, successfully ensure that the permittee will be held responsible for funding a cleanup operation either during or after mining operations and reclamation.

Finally, the **reporting and official statements** requirements do not provide a great deal of detail, as follows from the generally weak monitoring framework. All information is, however, reviewable by the public.

C. WISCONSIN

Category:	Overall Grade:
6. Regulatory Scope	Fair
7. Review Process	Fair
8. Enforcement	Good
9. Program Resources	Fair
10. Reporting and Official Statements	Good

Wisconsin’s sulfide mining law has perhaps the greatest **regulatory scope** of any of the U.S. jurisdictions surveyed, providing detailed standards for permit applications and review in all phases of mining, from exploratory activities through reclamation. Notably, state agencies are charged with the essential task of completing the environmental review for the project in the

application phase, rather than the permittee. Special attention is paid to siting criteria and water quality, and the financial assurance mechanisms are written to ensure that any necessary cleanup will be fully funded by the permittee. However, as in Minnesota, the reclamation standard and overall policy of the program is aimed not merely at environmental protection, but includes economic growth as a balancing factor.

The **application review** process in Wisconsin is regulated by highly technical requirements, both for the applicant’s submission and for the state’s review and decision-making process. The review process is further strengthened by the “prove-it-first” requirement and by the state’s retention of authority to investigate and prepare an independent environmental analysis, rather than a reliance on an applicant-provided analysis. Public participation is also a central feature of the review process and is encouraged through multiple opportunities for comment and protest in formal hearings. The process could be improved by allowing for more input and consideration of tribal and local government concerns.

The **enforcement** authority granted to Wisconsin’s DNR and to the public is the most extensive of any jurisdiction surveyed. It is marked not only by multiple opportunities and mandates for state enforcement actions, but also by open access for citizen participation in state enforcement actions and even direct citizen lawsuits against violators of the mining law. The one deficiency in this assessment category is the lack of a systematic monitoring scheme for the state to independently inspect and evaluate mining and reclamation activities.

Wisconsin’s **program resources** are reasonably funded by direct billing of program costs to applicants in the application phase, but there are no such mechanisms in place to fund enforcement or monitoring activities. Financial assurance mechanisms may be subject to claims by a permittee’s creditors. The potential shortfalls created by weak funding mechanisms could endanger the proper functioning of the regulatory scheme.

The requirements for **reporting and official statements** are relatively well-developed in Wisconsin, and as in all U.S. jurisdictions, all data and reports are fully publicly accessible.

D. ONTARIO

Category:	Overall Grade:
6. Regulatory Scope	Fair/Poor
7. Review Process	Poor
8. Enforcement	Fair
9. Program Resources	Poor
10. Reporting and Official Statements	Fair

Ontario’s **regulatory structure** does not require that a permit be obtained from the Ministry of Northern Development and Mines in order to commence mining operations. A mine is subject to limited environmental assessment (federally and/or provincially), though the disposition of the public resources is currently exempt from Ontario’s *Environmental Assessment Act*. Prior to operations commencing, a detailed closure plan must be submitted to the Ministry of Northern Development and Mines. Closure plans must comply with the Mine Rehabilitation Code, which has detailed requirements related specifically to sulfide mining. As well, recent amendments to Ontario’s *Mining Act* will provide additional regulatory structure once supporting regulations are developed. Approvals may also be required pursuant to environmental laws

administered by the Ontario Ministry of the Environment and Ministry of Natural Resources and the federal Department of Fisheries and Oceans.

As there is no mining permit approval, there is no formal **review process**. In particular, although a closure plan is mandated, the Ministry of Northern Development and Mines does not have the authority to approve/reject the closure plan. There are review processes required for environmental assessments and for approvals for activities related to mining; however, materials submitted to the approving authority are not generally made available to the public. There is some informal coordination among approval authorities when assessing proposed projects; however, cooperation between the federal and provincial government on environmental assessments is voluntary. First Nations have limited ability to influence the review process.

Ontario's **enforcement** authority is limited to those approvals that are granted for activities related to mining. With respect to the approvals that are granted for activities related to mining, there are a number of mechanisms for enforcement, including the ability to make orders and civil penalties. Under Ontario's *Environmental Bill of Rights*, residents of Ontario are given some ability to participate in government decision making and the enforcement of any resulting approvals. Barriers to participation include difficulties in accessing information and adverse cost consequences of litigation. There are no provincial funding mechanisms that enable public participation.

The **program resources** available are very likely not sufficient to fund the work required for the various components related to sulfide mining in Ontario. Any permit application fees are not dedicated to use by the mining regulatory body and although civil penalties are available in Ontario, they do not exist within the *Mining Act*. Financial assurance can be provided in forms that are safe from creditors, though this is not a requirement for all of the mines.

Finally, information requirements for **reporting and official statements** both federally and provincially are of high quality. However, public access to the information is almost nonexistent. Accessibility to provincial datasets is better than is available federally, though the public release of information relevant to mining is subject to extensive lags.

PART II: FINDINGS AND DEFICIENCIES

1. REGULATORY SCOPE

The regulatory scope of a sulfide mining regulation program refers to the breadth and depth of issues and activities regulated by the jurisdiction, and also to the overall purposes and goals of the program. This analysis does not evaluate or account for how the law is actually implemented but simply how it is written; the quality of application and implementation is evaluated in later sections. An ideal program would cover all the major issues of concern (e.g., runoff from tailings, structural stability, financial capacity of the operator, etc.) and also set a robust policy goal for remediation and the greatest degree of environmental protection both during and after mining activities. Fulfillment of the following criteria would indicate a comprehensive system of regulation with an appropriate end goal of the greatest possible protection to the human and natural environment:

1. The state or province regulates a broad array of issues unique to sulfide mining, including: production, transport and fate of acid mine drainage and other contaminants; siting and buffers; heap and dump leaching; waste rock piles and storage; tailings basin management; particulate contributions to acidic conditions on and off site; transportation of acid-producing materials; long-term remediation and short and long-term acid production potential in pit and storage areas.
2. The state or province regulates and exhibits comprehension of the structural integrity of mines, including thorough rock mechanics review, lateral support issues and impacts to adjacent lands.
3. The state or province uses an ecosystem-based approach to mining regulation and employs comprehensive and integrated regulation and analysis of air, surface water, ground water and aquifer impacts, and considers all discharges synergistically to determine impacts on bioaccumulative chemicals of concern.
4. Regulations are applicable statewide or province-wide.
5. The state or province regulates exploration to ensure protective capping and site remediation, and a thorough review process determines whether exploration is permitted based on the location's appropriateness for future mining.
6. The state or province has an adequate monitoring program that allows for proactive, protective measures to be taken prior to any release or accident.
7. The state or province requires mining and cleanup operations to comply with all applicable state, federal and tribal regulations.
8. The state or province requires adequate up-front financial assurance to cover costs for worst-case scenario failures, contingency plan implementation.
9. Financial assurance requirements reach beyond the term of the mining and waste management permits to encompass long-term water treatment needs, etc.
10. A comprehensive web of effective, interactive regulations protect surface water, ground water, air, land, wildlife habitat, wetlands, endangered species and assess impacts on global warming; mining operations are not exempted.

11. An environmental review process that uses ecological values and carrying capacity is required and is applied by the state or province to determine where mining will be allowed.
12. Numeric standards or determination processes for setting numeric standards are consistently applied to all discharges in every medium (water, air, etc.); standards apply to all contaminants from all media and there are standards specifically applicable to sulfide mining contaminants (sulfides, heavy metals, chlorine, etc.).
13. The state or province requires holistic mine plans, including factors like stability, workers' safety; long-term viability of the mine (prohibiting high-grading), economic plans for communities' long-term health, reasonable royalties, past performance of applicant and community priorities as expressed in Master Plans, zoning, etc.
14. Mining sites must be returned to a functioning ecosystem that does not require perpetual care post-mining.
15. The state or province requires that all impacts, on and off site, be analyzed, assessed and included in permitting decisions.
16. The state or province requires a cumulative impacts analysis that includes impacts from any beneficiation or transportation of the facility's ore in the state or province.
17. The state or province requires contingency plans for any potential failures.

A. MICHIGAN

Michigan’s sulfide mining law was established to manage the predicted environmental hazards of environmental mining, focusing especially on AMD. It encompasses most of these hazards, and its overall program goal is written in the strongest possible terms to protect the environment and human health and restore the ecosystem in the post-closure phase. However, the law is relatively weak on setting specific standards that could and should be common to any and all sulfide mines, does not fully account for non-environmental impacts, does not regulate exploratory activities sufficiently, and does not set up a framework for meaningful coordination between different regulatory programs applicable to sulfide mining. Part 632 and its implementing regulations appear to provide a strong foundation and admirable goals for sulfide mine regulation, but there is room for improvement.

Overall grade: Fair.

1	The state or province regulates a broad array of issues unique to sulfide mining, including: production, transport and fate of acid mine drainage and other contaminants; siting and buffers; heap and dump leaching; waste rock piles and storage; tailings basin management; particulate contributions to acidic conditions on and off site; transportation of acid-producing materials; long-term remediation and short and long-term acid production potential in pit and storage areas.	SOME
2	The state or province regulates and exhibits comprehension of the structural integrity of mines, including thorough rock mechanics review, lateral support issues and impacts to adjacent lands.	SOME
3	The state or province uses an ecosystem-based approach to mining regulation and employs comprehensive and integrated regulation and analysis of air, surface water, ground water and aquifer impacts, and considers all discharges synergistically to determine impacts on bioaccumulative chemicals of concern.	SOME
4	Regulations are applicable statewide or province-wide.	YES
5	The state or province regulates exploration to ensure protective capping and site remediation, and a thorough review process determines whether exploration is permitted based on the location’s appropriateness for future mining.	SOME
6	The state or province has an adequate monitoring program that allows for proactive, protective measures to be taken prior to any release or accident.	SOME
7	The state or province requires mining and cleanup operations to comply with all applicable state, federal and tribal regulations.	SOME
8	The state or province requires adequate up-front financial assurance to cover costs for worst-case scenario failures and contingency plan implementation.	SOME
9	Financial assurance requirements reach beyond the term of the mining and waste management permits to encompass long-term water treatment needs, etc.	YES
10	A comprehensive web of effective, interactive regulations protect surface water, ground water, air, land, wildlife habitat, wetlands, endangered species and assess impacts on global warming; mining operations are not exempted.	SOME

11	An environmental review process that uses ecological values and carrying capacity is required and is applied to determine where mining will be allowed.	NO
12	Numeric standards or determination processes for setting numeric standards are consistently applied to all discharges in every media (water, air, etc.); standards apply to all contaminants from all media and there are standards specifically applicable to sulfide mining contaminants (sulfides, heavy metals, chlorine, etc.).	SOME
13	The state or province requires holistic mine plans, including factors like: stability, workers' safety; long-term viability of the mine (not allowing just high-grading), economic plans for communities long-term health, reasonable royalties, past performance of applicant and community priorities as expressed in Master Plans, zoning, etc.	NO
14	Mining sites must be returned to a functioning ecosystem that does not require perpetual care post-mining.	YES
15	The state or province requires that all impacts, on and off site, be analyzed, assessed and included in permitting decisions.	SOME
16	The state or province requires a cumulative impacts analysis that includes impacts from any beneficiation or transportation of the facility's ore in the state or province.	YES
17	The state or province requires contingency plans for any potential failures.	YES

Discussion:

1. The state or province regulates a broad array of issues unique to sulfide mining, including: production, transport and fate of acid mine drainage and other contaminants; siting and buffers; heap and dump leaching; waste rock piles and storage; tailings basin management; particulate contributions to acidic conditions on and off site; transportation of acid-producing materials; long-term remediation and short and long-term acid production potential in pit and storage areas.

Michigan regulates nearly all of these issues to some extent. This is not an evaluation of how well Michigan regulates these issues, but merely a statement that the state addresses in one way or another the major issues and concerns surrounding sulfide mining.

The production, transport and fate of AMD: These are the primary concerns underlying Michigan's Part 632:

Nonferrous metallic sulfide deposits are different from the iron oxide ore deposits currently being mined in Michigan in that the sulfide minerals may react, when exposed to air and water, to form acid rock drainage. If the mineral products and waste materials associated with nonferrous metallic sulfide mining operations are not properly managed and controlled, they can cause significant damage to the environment, impact human health, and degrade the quality of life of the impacted community.

MCL § 324.63202(c).

Heap and dump leaching; waste rock piles and storage; tailings basin management; particulate contributions to acidic conditions on and off site: The production and fate of mine waste material is the central focus of Part 632, from the original application through monitoring and remediation phases. An applicant for a sulfide mining permit must submit an environmental impact assessment (“EIA”) and a mining, reclamation and environmental protection plan to the Michigan Department of Environmental Quality (“DEQ”). MCL § 324.63205. The mining, reclamation and environmental protection plan must include descriptions and plans for the control of mined materials and any tailings, also including “chemical and physical testing and modeling to predict the potential generation of acid, dissolved metals, and other related substances by reaction and leaching” R 425.302(c)(v)(A).

Once operational, the permittee is bound by administrative rules governing the treatment and containment of reactive materials, including:

- stockpiles and storage facilities must have a leak detection system, a leachate collection system, a composite liner system, a cover, etc., all certified by a registered professional engineer. R 425.409.
- DEQ may permit an alternative method for managing reactive waste if the operator demonstrates such a method is at least as protective as those prescribed, and incorporates at least one of a list of alternative treatment and isolation measures. R 425.409(a)(ii). This rule also covers the permitting and protective requirements for disposal facilities, if used. R 425.409(b).

Transportation of acid-producing materials: Transportation activities are subject to the same review and scrutiny as any other mining activity. The mining, reclamation and environmental protection plan must include “. . .provisions to prevent the release of contaminants to the environment from ore or waste rock during transportation.” R 425.203(c)(xviii) (emphasis added). Further, the rules include “transportation of overburden, waste rock, ore and tailings” in the definition of “mining activity.” R 425.103(1)(a)(vi).

Long-term remediation and short and long-term acid production potential in pit and storage areas: Remediation of the mining and waste disposal sites is a central feature of Part 632 and its implementing regulations. The permit applicant’s mining, reclamation and environmental protection plan must include “[p]lans and schedules for interim and final reclamation of the mining area following cessation of mining operations” (MCL §324.63205(2)(c)(iii)) and “[p]rovisions for the prevention, control, and monitoring of acid-forming waste products and other waste products from the mining process so as to prevent leaching into groundwater or runoff into surface water” (MCL § 324.63205(2)(c)(v)). The baseline for setting the remediation standard is identified in the EIA, which must report on the current and projected (post-mining and cumulative impacts) conditions of all natural and man-made features surrounding the mining area and the affected area. R 425.202.²⁶

The mining, reclamation and environmental protection plan must include a description of tailings management, erosion control and stabilization, R 425.203, and a monitoring plan for monitoring both surface and groundwater. R 425.203. An additional section of rules provides

²⁶ A “mining area” is any area where mining activities take place (MCL § 324.63201(h)), while an “affected area” is any area “outside of the mining area where the land surface, surface water, groundwater, or air resources are determined through an environmental impact assessment to be potentially affected by mining operations within the proposed mining area.” MCL §324.63201(b).

further details on standards for ground and surface water monitoring during operations. R 425.406. The applicant's reclamation plan must include sealing, stabilization, revegetation, continued water quality monitoring during the post-closure period. R 425.204. The prescribed endpoint of reclamation is a "self-sustaining ecosystem appropriate for the region that does not require perpetual care following closure [...] ecological condition that approximate premining conditions" R 425.204(b)(vi).

Siting and Buffering: One area, however, which is not covered explicitly by the statute or rules is siting and buffering. There are no automatically prohibited or "unsuitable" areas off limits to sulfide mining, nor minimum buffer zones prescribed between mining or processing areas and other land uses or property owners. Given the impacts of any sizable mining operation, including unavoidable noise, dust, and associated disturbances, the lack of siting standards is a significant deficiency.

2. The state or province regulates and exhibits comprehension of the structural integrity of mines, including thorough rock mechanics review, lateral support issues and impacts to adjacent lands.

Structural integrity is considered, but not particularly required, by Michigan's regulations. A sulfide mining permit applicant's mining, reclamation and environmental protection plan must include a plan for "preventing damage to the environment or public health or safety from subsidence, caving, or collapse of underground mine workings." R 425.203(c)(xi). Further sub-sections include a provision to assure that no material damage is done to natural features or to structures not owned by the operator. R 425.302(c)(xi). These rules do not prohibit subsidence or subsidence-producing activities per se, but merely suggest that such subsidence should not cause negative environmental or other impacts. The rules provide no specifics for how to achieve structural integrity or a minimum level of safety. Compared to the treatment by other jurisdictions (see below), this is a barely minimum requirement.

3. The state or province uses an ecosystem-based approach to mining regulation and employs comprehensive and integrated regulation and analysis of air, surface water, ground water and aquifer impacts, and considers all discharges synergistically to determine impacts on bioaccumulative chemicals of concern.

An ecosystem-based approach is part of the overarching purpose of the nonferrous statute and rules and the EIA process, but does not carry through into the practical regulatory structure of Michigan's program. The overarching theory or purpose of the sulfide mining regulations is to manage the operation and reclaim and remediate the finished site "to achieve a self-sustaining ecosystem appropriate for the region" MCL §324.63209(8) and R 425.204(b)(vi). In the application phase, cumulative and additive impacts are analyzed through the EIA process. The applicant's EIA (required under 425.201(1)(c)) must analyze cumulative and additive impacts of the proposed operation on surface and ground water, soil, air, and etc. See R 425.202(2). The EIA must also assess "significant interactions between chemical and physical properties of any discharges, with reference to the physical and chemical characteristics of the environment into which the discharge may be released." Id.

However, there is no requirement or framework set up for a coordinated approach to manage air, water, and other impact issues. Throughout the application, monitoring and reclamation phases, air and water impacts are regulated and monitored within DEQ, which

establishes a mining team for each project including members from different divisions and programs involved in the project's regulation.²⁷ Yet there is no guarantee or requirement that the different impacts (to air, water, adjacent land, and so on) be managed or evaluated holistically or that the mining team participants actually coordinate their work in any way. In particular, there is no formal connection or communication required between the mining program and the water quality program which administers the Clean Water Act permits. See the Water Quality Report, at Appendix A.

4. Regulations are applicable statewide or province-wide.

There are no geographic exceptions to application of the law or regulations.

5. The state or province regulates exploration to ensure protective capping and site remediation, and a thorough review process determines whether exploration is permitted based on the location's appropriateness for future mining.

Exploration is not regulated by Part 632 or the associated rules and there is no permitting process for exploration of potential sulfide mines. In certain limited circumstances, exploratory activities may be covered under Part 625 of NREPA, which regulates the drilling of geologic test wells. MCL §324.62506 *et seq.*, R 299.2301 *et seq.* Part 625 requires drillers of test wells reaching a certain depth into the groundwater table to file an application and conformance bond with DEQ, and requires DEQ to investigate and inspect the area. MCL §324.62509(2). However, trenching or less intensive geophysical activities are not regulated, and some test wells (e.g. test wells drilled into Precambrian rock, e.g.) are not regulated. See MCL §324.62509(3).

6. The state or province has an adequate monitoring program that allows for proactive, protective measures to be taken prior to any release or accident.

While Michigan requires a monitoring plan as part of a permit and establishes some clear standards for monitoring parameters, it does not require regular or independent inspections by state regulators and leaves the monitoring plan development and testing largely in the hands of the mine operator. Every mining permit must include a monitoring plan, which is initially proposed by the operator (not independently developed by the state) and which must include “[p]rovisions for the prevention, control, *and monitoring* of acid-forming waste products and other waste products from the mining process so as to prevent leaching into groundwater or runoff into surface water.” MCL § 324.63205(2)(c)(v) (emphasis added). The mining permit will require the permit-holder to conduct groundwater and surface water monitoring during mining and in the post-closure period. MCL § 324.63209(6).

Additional requirements for the monitoring plan are set in the rules (R 425.203(g)-(h)), as are some monitoring standards. For example, the permittee must notify DEQ and increase monitoring when a solute level reaches 2 standard deviations above background levels. R 425.406. Further, if the permittee detects solute concentrations greater than ½ the level between background levels and the safe drinking water standard or a pH change of greater than .5 units pH for two or more consecutive monitoring events, it must seek the source of the change and

²⁷ This and other procedures related to application review are outlined in an informal internal DEQ guidance document. Michigan Department of Environmental Quality (2007), “Review and Processing of Nonferrous Metallic Mineral Mining Permit Applications, December 20, 2007”. Department of Environmental Quality Policy and Procedures, Number 09-011.

report to DEQ. R 425.406(7)-(8). If the mining activity is deemed to be the source of the solute or pH change, the permittee must implement a response as approved by DEQ. Id.

Every year during operation and in the post-closure period, the permit holder must file an annual report including, “[a] report of monitoring results for the preceding calendar year.” MCL §324.63209(6), R425.501. In addition to the annual report, the permit holder must “promptly notify the department and each emergency management coordinator having jurisdiction over the affected area of any incident, act of nature, or exceedance of a permit standard or condition at a mining operation that has created, or may create, a threat to the environment, natural resources, or public health and safety.” MCL § 324.63213(2) (emphasis added).

DEQ is not required by any rule, statute or internal procedure to conduct regular monitoring of the operation or site, though DEQ may enter and inspect the mining operation at any reasonable time. R425.408. The major limitation of the above standards is that they are all self-reported and there is no requirement or set of standards for DEQ to evaluate the submissions.

7. The state or province requires mining and cleanup operations to comply with all applicable state, federal and tribal regulations.

While the permit application must list all other state and federal permits anticipated to be required, MCL §324.63205(2)(f), there is no requirement for the applicant or permittee to comply with other laws or regulations through the active mining and cleanup periods. The only specific requirement for compliance with all federal and other state laws is that the reclamation plan provide assurance that “[f]inal disposition of all toxic and hazardous wastes, refuse, tailings and other solid waste shall be managed in a manner that protects the environment, natural resources and public health and safety, in conformance with all other applicable federal and state laws and regulations.” R 425.204(b)(i) (emphasis added). Further, there is no state requirement that the permittee comply with any applicable tribal regulations.

8. The state or province requires adequate up-front financial assurance to cover costs for worst-case scenario failures and contingency plan implementation.

A permittee must maintain financial assurance during mining operations until the department determines that all reclamation is complete and through the post-closure (20 year) period, or until the mining permit is terminated for failure to commence mining activities. MCL § 324.63211 (“Financial Assurance”) and R 425.301-309 (Part 3 of the Rules: Financial Assurance) cover this. The permit is not effective until financial assurance is established, and if the permittee fails to maintain financial assurance, this is a violation of the permit. Rule 425.301(1). The financial assurance must be “sufficient to cover the cost to administer, and to hire a third party to implement, reclamation under the mining, reclamation, and environmental protection plan as well as necessary environmental protection measures, including remediation of any contamination of the air, surface water, or groundwater that is in violation of the mining permit.” §324.63211(2). The second clause (“as well as...”) could cover any “worst-case scenario” situations, i.e. contamination beyond what was expected and planned for in the original reclamation plan.

The amount of financial assurance required by the state is based on the applicant’s submission of projected costs that would cover its planned remediation, reclamation, and post-closure monitoring activities. R 425.301(2)(a). MDEQ may hire external consultants to assist in evaluating the applicant’s estimate, but is not required to do so. The permittee must update this

calculation every three years. R 425.308. The department may require additional financial assurance (beyond the amount calculated by the permittee) to cover any other activities or costs that it believes may be incurred above and beyond the planned reclamation, remediation and monitoring. R 425.301(2)(b).

9. Financial assurance requirements reach beyond the term of the permit to encompass long-term water treatment needs, etc.

The financial assurance requirements end only when the post-closure period is over, which is when the department determines there is no significant potential for water contamination resulting from the mining operation. MCL §§ 324.63211, 324.63209(6).

10. A comprehensive web of effective, interactive regulations protect surface water, ground water, air, land, wildlife habitat, wetlands, endangered species and assess impacts on global warming; mining operations are not exempted.

The many aspects and impacts of sulfide mining may be covered by different regulatory regimes, but whether and how they are coordinated is not clear. Sulfide mining operations are not exempt from air or water quality laws, endangered species protections, or any other environmental law or regulations. The project team assembled to manage and oversee a project is composed of representatives from all involved departments/programs. However, as noted above, there is no mechanism for systematic coordination between the programs and regulations, and it remains to be seen whether and how they will in fact operate in managing an active mine.

11. An environmental review process that uses ecological values and carrying capacity is required and is applied by the state or province to determine where mining will be allowed.

While siting is not directly addressed in Part 632 or its implementing rules, a poor EIA could result in re-siting. The EIA must include a description of baseline conditions, i.e. “the natural and human-made features, including, but not limited to, flora, fauna, hydrology, geology, and geochemistry, and baseline conditions in the proposed mining area and the affected area ...” MCL § 324.63205(2)(b). The rules set forth an exhaustive list of conditions that must be catalogued in the EIA. R 425.202. According to the rules, the DEQ cannot approve a permit to mine unless the proposed operation “will not pollute, impair, or destroy the air, water or other natural resources or the public trust in those resources ...” R 425.301(7)(b). Re-siting is a reasonable alternative to denying or cancelling a project application.

It is important to remember, however that the EIA is prepared by the applicant, not by DEQ, which is considered a red flag by many experts and environmentalists. Finally, “carrying capacity,” or any like term, is not used in the statute or rules in the context of EIA (pre-permitting) review.

12. Numeric standards or determination processes for setting numeric standards are consistently applied to all discharges in every media (water, air, etc.); standards apply to all contaminants from all media and there are standards specifically applicable to sulfide mining contaminants (sulfides, heavy metals, chlorine, etc.).

Numeric standards for contaminants in all media will be set on a project-specific basis, but there are no specific baseline standards set for sulfide mining contaminants. As a baseline (in the absence of more stringent state standards), federal standards for air and water quality apply

equally in all states; there are no federal exceptions for sulfide mining. For water quality standards, see the Water Quality Report, at Appendix A.

Water quality standards are based on background conditions at the project site. The antidegradation standard (R 323.1098) for water quality applies to any activity “anticipated to result in a new or increased loading of pollutants by any source to surface waters of the state and for which independent regulatory authority exists requiring compliance with water quality standards.” Rule 406 sets water quality monitoring standards, but these are all based on site-specific conditions, not absolutes. There are no special or specific numeric standards applicable to sulfide mining.

13. The state or province requires holistic mine plans, including factors like: stability, workers’ safety; long-term viability of the mine (prohibiting high-grading), economic plans for communities’ long-term health, reasonable royalties, past performance of applicant and community priorities as expressed in Master Plans, zoning, etc.

Michigan’s law in this area excludes most non-environmental impacts. The requirements for the mining plan are focused on environmental impacts and plans for prevention, control and remediation of adverse environmental impacts, not social or economic impacts. However, the mining plan must establish at least the expected life of the mine (R425.203(a)), number of employees and timing of employment over the life of the mine (R425.203(b)), and a plan to prevent damage to public health/safety from subsidence/caving, including potential effects on drinking water, and natural features and structures not owned by the applicant (R 425.203(c)(xi)).

The rules do not specify or explicitly require stability, workers’ safety, long-term viability of the mine (prohibiting high-grading), economic plans for communities’ long-term health, reasonable royalties, past performance of applicant, or community priorities as expressed in local planning. These may be required in addition by local governments or other state agencies (e.g. worker safety) but are not part of the state mine permitting requirements.

14. Mining sites must be returned to a functioning ecosystem that does not require perpetual care post-mining.

This is precisely the language used by Part 632’s reclamation plan requirement: The endpoint of reclamation is to be a “self-sustaining ecosystem appropriate for the region that does not require perpetual care following closure [...] ecological condition that approximate premining conditions” R 425.204(b)(vi).

15. The state or province requires that all impacts, on and off site, be analyzed, assessed and included in permitting decisions.

All environmental impacts are, in theory, evaluated through the EIA, which is the foundation of the permit application process. However, the scope of the EIA does not necessarily include financial or social impacts; it covers only environmental impacts. See MCL § 324.63205(2)(b), R 425.202.

16. The state or province requires a cumulative impacts analysis that includes impacts from any beneficiation or transportation of the facility’s ore in the state or province.

The EIA must include an analysis of potential cumulative impacts “in the mining area and the affected area from all proposed mining activities and through all processes or

mechanisms.” R 425.202(b). Beneficiation and transportation are included in the Rules’ definition of “mining activity”. R 425.103(a).

17. The state or province requires contingency plans for any potential failures.

A contingency plan is required of all mining permit applicants. MCL §324.63205.2(d), R 425.201(1)(e), R425.205. The applicant must assess the risk to the environment or public health and safety of accidents or failures involving a list of potential hazards, and set the response protocol for each. R 425.205(1)(a). The contingency plan must also set an emergency response and notification system, including procedures for notifying the public, local authorities and safety agencies, a list of contacts within the company and emergency services, and a plan for testing the contingency plan to assure its effectiveness. R 425.205(1)(b)-(d). The plan must be sent to each emergency management coordinator with jurisdiction over the affected area. R425.205(2). Finally, the rules require immediate reporting of any accident or incident (to the agency and local emergency and government authorities), and a detailed written incident report to the agency to be filed within 10 days of any occurrence. R 425.503.

B. MINNESOTA

Minnesota’s regulation of sulfide mining is fairly comprehensive, with great detail devoted to reclamation standards in particular. However, the program could be improved by increasing specificity in certain areas and by promoting environmental protection as the essential element in permitting decisions. As they stand, the regulations give significant leeway to DNR to make decisions in any number of ways, which may or may not be most protective of the environment.

Overall Grade: Fair.

1	The state or province regulates a broad array of issues unique to sulfide mining, including: production, transport and fate of acid mine drainage and other contaminants; siting and buffers; heap and dump leaching; waste rock piles and storage; tailings basin management; particulate contributions to acidic conditions on and off site; transportation of acid-producing materials; long-term remediation and short and long-term acid production potential in pit and storage areas.	YES
2	The state or province regulates and exhibits comprehension of the structural integrity of mines, including thorough rock mechanics review, lateral support issues and impacts to adjacent lands.	YES
3	The state or province uses an ecosystem-based approach to mining regulation and employs comprehensive and integrated regulation and analysis of air, surface water, ground water and aquifer impacts, and considers all discharges synergistically to determine impacts on bioaccumulative chemicals of concern.	SOME
4	Regulations are applicable statewide or province-wide.	YES
5	The state or province regulates exploration to ensure protective capping and site remediation, and a thorough review process determines whether exploration is permitted based on the location’s appropriateness for future mining.	SOME

6	The state or province has an adequate monitoring program that allows for proactive, protective measures to be taken prior to any release or accident.	NO
7	The state or province requires mining and cleanup operations to comply with all applicable state, federal and tribal regulations.	NO
8	The state or province requires adequate up-front financial assurance to cover costs for worst-case scenario failures and contingency plan implementation.	SOME
9	Financial assurance requirements reach beyond the term of the mining and waste management permits to encompass long-term water treatment needs, etc.	YES
10	A comprehensive web of effective, interactive regulations protect surface water, ground water, air, land, wildlife habitat, wetlands, endangered species and assess impacts on global warming; mining operations are not exempted.	SOME
11	An environmental review process that uses ecological values and carrying capacity is required and is applied to determine where mining will be allowed.	SOME
12	Numeric standards or determination processes for setting numeric standards are consistently applied to all discharges in every media (water, air, etc.); standards apply to all contaminants from all media and there are standards specifically applicable to sulfide mining contaminants (sulfides, heavy metals, chlorine, etc.).	SOME
13	The state or province requires holistic mine plans, including factors like: stability, workers' safety; long-term viability of the mine (not allowing just high-grading), economic plans for communities long-term health, reasonable royalties, past performance of applicant and community priorities as expressed in Master Plans, zoning, etc.	NO
14	Mining sites must be returned to a functioning ecosystem that does not require perpetual care post-mining.	NO
15	The state or province requires that all impacts, on and off site, be analyzed, assessed and included in permitting decisions.	SOME
16	The state or province requires a cumulative impacts analysis that includes impacts from any beneficiation or transportation of the facility's ore in the state or province.	YES
17	The state or province requires contingency plans for any potential failures.	YES

Discussion:

1. The state or province regulates a broad array of issues unique to sulfide mining, including: production, transport and fate of acid mine drainage and other contaminants; siting and buffers; heap and dump leaching; waste rock piles and storage; tailings basin management; particulate contributions to acidic conditions on and off site; transportation of acid-producing materials; long-term remediation and short and long-term acid production potential in pit and storage areas.

Minnesota regulates each of these areas, and provides a remarkable degree of detail in most.

Production, transport and fate of acid mine drainage and other contaminants: Minn. Rules 6132.2200 (“Reactive Mine Waste”) states as policy that “[r]eactive mine waste shall be mined, disposed of, and reclaimed to prevent the release of substances that result in the adverse impacts

on natural resources.” All mining operations must meet four requirements: (A) conduct a waste characterization study as part of the permit application and annually through the life of the permit (R6132.1000), (B) be designed by a professional qualified engineer registered in-state, and (C) include a monitoring system in the project design, unless (D) adhering to the requirements would inhibit design. Minn. Rules 6132.2200, Subpt 2. The rules further specify that the permit application’s mining and reclamation maps must show “detailed drainage patterns for waters that may contact reactive mine wastes.” Minn. Rules 6132.100, subpt 7(C). DNR cannot issue a permit to any operation that uses or results in “in-situ leaching as part of the beneficiating process.” Minn. Rules 6132.0300, Subpt. 4(B)(2).

Siting and buffers: The goal of the rules regarding siting is to “minimize adverse impacts on natural resources and the public.” Minn. Rules 6132.2000, subpt 1. “All sites shall incorporate setbacks or separations that are needed to comply with air, water, and noise pollution standards; local land use regulations; and requirements of other appropriate authorities.” *Id.* All mining operations should be sited to minimize impacts, including subsidence, runoff and seepage, conflicts with neighboring uses, and so on. *Id.*, Subpt 5. Buffers constructed of natural materials must be used to minimize impacts and make the operation compatible with surrounding non-mining uses. Minn. Rules 6132.2100.

In addition to the general siting policy applicable to all sites, mining is totally prohibited in a number of listed protected areas, such as the Boundary Waters Canoe Area Wilderness, Voyageurs National Park, state wilderness areas or state scientific natural areas, etc. Minn. Rules 6132.2000, subpt 2, A-H. Also, mining that disturbs surface areas is prohibited in other listed areas, generally within ¼ mile of the prohibited areas listed in subpt 2 (A-H), plus a number of other designated areas with special wilderness or environmental value. *Id.*, subpt 3, A-M.

Finally, mining is restricted (i.e., allowed only where there is no feasible and prudent alternative) in other listed areas, including national wildlife refuges, national waterfowl production areas, national trails, state wildlife management areas, state designated trails, specially identified peatlands, parts of the Lake Superior lakeshore, and within 500 ft of an occupied dwelling, school, church, public institution, public park or within 100 ft of a cemetery or right of way of a public road. Minn. Rules 6132.2000, Subpt 4. In any of these restricted circumstances, the applicant must show no adverse environmental impacts or that it will provide reasonable mitigation. *Id.* Finally, no mining is permitted in wetlands unless the draining/filling will be replaced or restored in accordance with the Wetlands Conservation Act and rules (6132.5300). (Subpt 6).

Heap and dump leaching: The reclamation standard rules set out very detailed requirements for design, monitoring and reclamation of heap and dump leaching facilities, “to be structurally sound, minimize hydrologic impacts, minimize the release of substances that adversely impact other natural resources, and promote progressive reclamation.” Minn. Rules 6132.2600. The heap and dump leaching facility design must provide site selection rationale, ensure that the design will meet all state and federal water quality standards, provide a means to detect and retrieve leaching solutions in the event of leakage, ensure that heavy rain or snow will not result in overtopping of ponds, identify monitoring locations, describe how residual leaching can be neutralized and detoxified, and include a schedule for engineering inspections throughout the construction, operation, reclamation and post-closure phases.

Waste rock piles and storage: The design, construction and operation of waste rock piles and storage is specifically addressed in the reclamation standards and must “minimize hydrologic impacts, enhance the survival and propagation of vegetation, be structurally sound, control erosion, promote progressive reclamation, and recognize the conservation of the mineral resources.” Minn. Rules 6132.2400. The rule sets height, slope, and buffer requirements for waste piles in different scenarios and for different types of waste.

Tailings basin management: The design, construction and operation of tailings basins are addressed in the reclamation standards and must be “structurally sound, control air emissions, minimize hydrologic impacts, promote progressive reclamation, and enhance the survival and propagation of vegetation.” Minn. Rules 6132.2500, subpt 1. The tailings basin design must meet many of the same standards set for waste rock piles and storage, including assurances of no overtopping in precipitation events, a reclamation plan for tailings basins, a schedule of engineering inspections, monitoring, and so on. *Id.*, subpt2.

Transportation of acid-producing materials: Transportation is not covered in the mining standards, but is covered in the environmental assessment done as part of the application. A non-ferrous metallic mining operation is required to produce both an EAW (environmental assessment worksheet), to be used as a scoping document for the EIS, and an EIS, under the Minnesota Environmental Policy Act (MEPA). Minn Stat, Ch. 116D, Rules 4410.4300, subpt 11; Rules 4410.4400, subpt 8. Mines are in the “mandatory EIS” category.

Long-term remediation and short and long-term acid production potential in pit and storage areas: A reclamation plan must be submitted with the application to mine, and must incorporate all the required elements of Rules 6132.2000-3200, which set forth the requirements for the design, methods, sequence and schedules of reclamation activities. Minn. Rules 6132.1100, subpt 6(C).

2. The state or province regulates and exhibits comprehension of the structural integrity of mines, including thorough rock mechanics review, lateral support issues and impacts to adjacent lands.

Structural integrity is ensured through minimum design requirements for pitwalls at Minn. Rules 6132.2300. Subsidence is further regulated by requiring that the mine design minimize subsidence to the extent practicable. Minn. Rules 6132.3000. If subsidence occurs, the permittee “shall establish ground control survey locations and conduct surveys to document the extent of ground movement” and shall contour or fill in such areas to protect public health and safety or natural resources. *Id.*

3. The state or province uses an ecosystem-based approach to mining regulation and employs comprehensive and integrated regulation and analysis of air, surface water, ground water and aquifer impacts, and considers all discharges synergistically to determine impacts on bioaccumulative chemicals of concern.

While the initial environmental review process considers effects and contaminants synergistically on an ecosystem-wide level, this coordinated review is not guaranteed in the actual regulation of an active mine. All metallic mineral mines and processing operations require the preparation of an EIS. Minn. Rules 4410.4400, subpt 8. DNR is the governmental unit

“responsible for verifying the accuracy of environmental documents and complying with environmental review processes in a timely manner,” Minn. Rules 4410.0400, subpt 2, but the permit applicant is the party responsible for creating the EIS.²⁸ In the EIS, chemicals or indicators of concern are considered “synergistically” across the various potential dispersal routes (air, water, etc). Minn. Rules 4410.2300(H).

However, following that review, there is no mechanism for coordinated review of specific chemicals or indicators. There is ad hoc communication between departments and a memorandum of understanding might be created to coordinate and define the roles of different departments, but generally the departments handle separately each permit under their purview (e.g., NPDES, CAA emissions, mining, etc.). For instance, DNR manages the mining permit while MPCA is the delegated CWA and CAA permitting authority via the EPA.

4. Regulations are applicable statewide or province-wide.

There are no blanket or geographic exceptions to application of the law or regulations.

5. The state or province regulates exploration to ensure protective capping and site remediation, and a thorough review process determines whether exploration is permitted based on the location’s appropriateness for future mining.

Exploratory activities are regulated only in very specific circumstances. If on land leased from the state, the lease requires reclamation for exploratory activities, and may also involve a department of health permit if drinking water is potentially affected. However, if located on private land, there is no permitting process for exploratory activities, unless again the water supply may be contaminated and department of health becomes involved. Bulk sampling would trigger an environmental analysis (at the EAW level) and would include a reclamation plan.²⁹

6. The state or province has an adequate monitoring program that allows for proactive, protective measures to be taken prior to any release or accident.

Monitoring requirements are very thin in Minnesota. The only monitoring required by law is self-monitoring by the permittee. State monitoring is not required by the mining regulations, though the permittee must allow DNR to inspect the operation and its records at DNR’s discretion. Minn. Rules 6132.5200. DNR will inspect at least annually, to double-check the permittee’s annual report.³⁰ There is no general schedule or requirement for self-monitoring by the permittee for construction, operations, and/or the reclamation and post-closure phases. However, the reactive mine waste storage facility, tailings basin, and heap and dump leaching facilities designs must include a schedule of inspection and monitoring points, “to ensure compliance with the design.” Minn. Rules 6132.2200, 2500, 2600.

DNR is not in charge of and does not consider water quality or other permits or monitoring for compliance with them. Instead, water quality is monitored by the Pollution Control Agency under a NPDES and SDS permit. (The SDS permit is the associated state water quality permit covering water quality issues not specifically addressed in the Clean Water Act.) NPDES/SDS permit-required water quality monitoring is done on a specified schedule (e.g.,

²⁸ Note: Prior to a 2011 amendment, DNR was responsible for creating the EIS. Under the amended law, the applicant can bypass a state-created EIS by submitting its own. Minn. Stat. §116D.04(subd2a)(i). It is not expected, however, that the law change will drastically change the practical process for EIS development.

²⁹ Jennifer Engstrom, Mineland Reclamation Section Manager, Minnesota DNR, (personal communication with author, August 9, 2011).

³⁰ Id.

‘weekly’, ‘twice-monthly’, ‘monthly’, etc.) The permittee self-reports to the MPCA the results of the NPDES/SDS permit-required monitoring on a monthly basis using an MPCA-approved reporting form and format. These monthly reports are routinely reviewed (at least semi-annually or annually for larger facilities) by MPCA compliance and enforcement staff. As resources allow, MPCA staff may conduct independent verification monitoring of the permittee’s monitoring.³¹ See the Water Quality Report for additional information, at Appendix A.

7. The state or province requires mining and cleanup operations to comply with all applicable state, federal and tribal regulations.

The administrative regulations state that they in no way supplant or override any other rule, statute or ordinance. R6132.0300, subpt 4(B)(2). However, compliance with other applicable laws is not a requirement to obtain or maintain a mining permit, and falling out of compliance with any one of the others will not affect the permit to mine (unless the problem causing the compliance failure is directly due to something regulated within the mining permit). The mining permit is not an overarching or controlling permit; it is coequal with all other standards and regulations. Certain of the reclamation standards (specifically the reactive mine waste facility and heap and dump leaching facilities) require that the reclamation design of these facilities be consistent with state and federal standards. Minn. Rules 6132.2200, 2600. Further, there is no state requirement that the permittee comply with any applicable tribal regulations.

8. The state or province requires adequate up-front financial assurance to cover costs for worst-case scenario failures, contingency plan implementation.

Financial assurance is calculated to cover (1) reclamation activities should the permittee fail to perform them when operations cease (based on the contingency reclamation plan, filed annually) and (2) corrective action costs if the permittee fails to perform required corrective actions. Minn. Rules 6132.1200. Financial assurance for the contingency plan must be calculated in the application and submitted to DNR before the permit to mine will be issued. Minn. Rules 6132.1200, Subpt 4. There is no “worst case scenario” general fund, as in Wisconsin, though the corrective action costs could account for this category of unforeseen damages.

9. Financial assurance requirements reach beyond the term of the mining and waste management permits to encompass long-term water treatment needs, etc.

Financial assurance must be maintained through the post-closure period. The permittee is released from this obligation when DNR determines through an inspection that all reclamation activities are complete and conditions necessitating post-closure maintenance no longer exist and are not likely to recur. Minn. Rules 6132.1200, subpt 4(H).

10. A comprehensive web of effective, interactive regulations protect surface water, ground water, air, land, wildlife habitat, wetlands, endangered species and assess impacts on global warming; mining operations are not exempted.

³¹ Ann Foss, Minnesota Pollution Control Agency, (personal communication to author, September 9, 2011).

Mining operations are not exempt from most environmental laws, including air and water quality.³² However, as noted above, coordination between the different permitting authorities and involved agencies is centralized during the EIS process, but thereafter is ad hoc.

11. An environmental review process that uses ecological values and carrying capacity is required and is applied by the state or province to determine where mining will be allowed.

Siting is a key aspect of the environmental review process. The rules call for detailed site analysis and list a number of prohibited or restricted areas, including all state wilderness areas, scientific and natural areas, and state parks. Minn. Rules 6132.2000. The goal of the siting policy is to allow mining only at sites that “minimize adverse impacts on natural resources and the public.” *Id.* The basic tenet of MEPA is to prohibit any governmental action, approval or permit of an activity that may cause significant harm to any part of the environment where there is a feasible or prudent alternative available. Minn. Stat. § 116.04(d), subd. 6.

12. Numeric standards or determination processes for setting numeric standards are consistently applied to all discharges in every media (water, air, etc.); standards apply to all contaminants from all media and there are standards specifically applicable to sulfide mining contaminants (sulfides, heavy metals, chlorine, etc.).

As a baseline (in the absence of more stringent state standards), federal standards for air and water quality apply equally in all states; there are no federal exceptions for sulfide mining. For water quality standards, see the Water Quality Report, at Appendix A. Air and water quality standards are set on a case-by-case basis, depending on underlying conditions. However, there are some general standards for heavy metals, chlorine, and other substances relevant to sulfide mining. See Minn. Rules 7050.

13. The state or province requires holistic mine plans, including factors like: stability, workers’ safety; long-term viability of the mine (not allowing just high-grading), economic plans for communities’ long-term health, reasonable royalties, past performance of applicant and community priorities as expressed in Master Plans, zoning, etc.

The purpose of the mining plan is to establish the physical design of the operation, rate of extraction, and remediation plan to prevent environmental harm to the greatest possible extent. While the surrounding communities’ wishes may be involved in the permitting decision-making process or monitoring of the facility, the law and regulations do not allow or suggest that the mining plan itself will incorporate conditions or requirements beyond immediate, on-site physical removal and remediation activities.

At the very least, however, the EIS process must take into account “economic, employment and socio-economic effects” of the proposed operation. Minn. Stat. 166.04(d), subd. 1(a). All direct, indirect, and cumulative effects, both positive and negative, must be described. Minn. R. 4410.2300(H). Also, the permittee must submit as part the application a certificate of insurance confirming it carries liability insurance for the proposed operation to compensate anyone who might be damaged as a result of the mining operation or any reclamation or restoration connected with the operation. R6132, Subpt 3(C).

³² One exception is that non-ferrous metallic mining and beneficiation is not subject to Minnesota’s general hazardous waste permitting regulations. Minn R. 7045.0120, subpt 1(I). The Ch. 6132 reclamation standards provide a substitute set of regulations.

14. Mining sites must be returned to a functioning ecosystem that does not require perpetual care post-mining.

Minnesota's policy goal does not necessarily require or aim for "functionality" but rather emphasizes doing the best job possible and returning the environment to the best "practicable" state:

...it is the policy of the Department of Natural Resources that mining be conducted in a manner that will reduce impacts to the extent practicable, mitigate unavoidable impacts, and ensure that the mining area is left in a condition that protects natural resources and minimizes to the extent practicable the need for maintenance.

Minn. Rules 6132.0200. The limitation provided by "to the extent practicable" is in keeping with the general policy of Minnesota's regulation, which attempts to balance environmental protection with the promotion of economic development:

... it is hereby declared to be the policy of this state to provide for the reclamation of certain lands hereafter subjected to the mining of metallic minerals [...]to control possible adverse environmental effects of mining, to preserve the natural resources, and to encourage the planning of future land utilization, while at the same time promoting the orderly development of mining, the encouragement of good mining practices, and the recognition and identification of the beneficial aspects of mining.

Minn. Stat. §93.44.

15. The state or province requires that all impacts, on and off site, be analyzed, assessed and included in permitting decisions.

DNR and the other permitting agencies rely on the EIS process to analyze as many impacts as are reasonably foreseeable, be they direct, indirect or cumulative. R 4410.2300(H). However, the statute and regulations do not give specific guidance or a rubric for DNR to follow in making a permitting decision. See Minn. Rules 6132.4000 ("Procedures for Obtaining a Permit to Mine"). Therefore, it is not clear whether all impacts must in fact be analyzed and included in permitting decisions.

16. The state or province requires a cumulative impacts analysis that includes impacts from any beneficiation or transportation of the facility's ore in the state or province.

Cumulative impacts are required as part of the EIS. Minn. Rules 4100.2300(H). This will include all parts of the proposed operation that require permitting or state action, involving in all cases beneficiation and transportation (where transportation is at a level or of a type requiring a permit).³³

17. The state or province requires contingency plans for any potential failures.

A contingency plan must be created annually to set reclamation, closure and post-closure plans if the operation were to cease in the following year. Minn. Rules 6132.1300, subpt 4. The contingency plan must also be part of the application (for the first year's operation). Minn. Rules 6132.1100, subpt 8.

³³ Jennifer Engstrom, supra note 25.

C. WISCONSIN

Wisconsin’s regulation of sulfide mining is highly detailed in certain areas, specifically in its consideration of leaching and water quality effects. It also serves as a model for regulating all phases of a mine operation, from prospecting through waste storage and remediation, and for requiring highly detailed and environmentally responsible site selection. However, while providing a good scope of regulation, the state fails to integrate the different aspects of regulation in a systematic way or to set a high standard for reclamation and return to a functioning ecosystem.

Overall grade: Fair.

1	The state or province regulates a broad array of issues unique to sulfide mining, including: production, transport and fate of acid mine drainage and other contaminants; siting and buffers; heap and dump leaching; waste rock piles and storage; tailings basin management; particulate contributions to acidic conditions on and off site; transportation of acid-producing materials; long-term remediation and short and long-term acid production potential in pit and storage areas.	YES
2	The state or province regulates and exhibits comprehension of the structural integrity of mines, including thorough rock mechanics review, lateral support issues and impacts to adjacent lands.	SOME
3	The state or province uses an ecosystem-based approach to mining regulation and employs comprehensive and integrated regulation and analysis of air, surface water, ground water and aquifer impacts, and considers all discharges synergistically to determine impacts on bioaccumulative chemicals of concern.	NO
4	Regulations are applicable statewide or province-wide.	YES
5	The state or province regulates exploration to ensure protective capping and site remediation, and a thorough review process determines whether exploration is permitted based on the location’s appropriateness for future mining.	SOME
6	The state or province has an adequate monitoring program that allows for proactive, protective measures to be taken prior to any release or accident.	SOME
7	The state or province requires mining and cleanup operations to comply with all applicable state, federal and tribal regulations.	NO
8	The state or province requires adequate up-front financial assurance to cover costs for worst-case scenario failures and contingency plan implementation.	YES
9	Financial assurance requirements reach beyond the term of the mining and waste management permits to encompass long-term water treatment needs, etc.	YES
10	A comprehensive web of effective, interactive regulations protect surface water, ground water, air, land, wildlife habitat, wetlands, endangered species and assess impacts on global warming; mining operations are not exempted.	SOME
11	An environmental review process that uses ecological values and carrying capacity is required and is applied to determine where mining will be allowed.	YES
12	Numeric standards or determination processes for setting numeric standards are consistently applied to all discharges in every media (water, air, etc.); standards apply to all contaminants from all media and there are standards specifically applicable to sulfide mining contaminants (sulfides, heavy metals, chlorine, etc.).	NO

13	The state or province requires holistic mine plans, including factors like: stability, workers' safety; long-term viability of the mine (not allowing just high-grading), economic plans for communities long-term health, reasonable royalties, past performance of applicant and community priorities as expressed in Master Plans, zoning, etc.	NO
14	Mining sites must be returned to a functioning ecosystem that does not require perpetual care post-mining.	NO
15	The state or province requires that all impacts, on and off site, be analyzed, assessed and included in permitting decisions.	YES
16	The state or province requires a cumulative impacts analysis that includes impacts from any beneficiation or transportation of the facility's ore in the state or province.	SOME
17	The state or province requires contingency plans for any potential failures.	YES

Discussion:

1. The state or province regulates a broad array of issues unique to sulfide mining, including: production, transport and fate of acid mine drainage and other contaminants; siting and buffers; heap and dump leaching; waste rock piles and storage; tailings basin management; particulate contributions to acidic conditions on and off site; transportation of acid-producing materials; long-term remediation and short and long-term acid production potential in pit and storage areas.

Wisconsin's regulations cover these issues in extreme detail, providing a near model of regulatory scope.

AMD: The threat of AMD contamination was the impetus behind one of the most remarkable aspects of Wisconsin's law. Wisconsin set a special standard for sulfide mining permit applications: a permit cannot be approved unless and until the applicant shows evidence of a sulfide mine with net acid generating potential in the U.S. or Canada which has been operating for at least 10 years, and one which has been closed for at least 10 years, without polluting groundwater or surface water from acid drainage at the tailings or mine sites or from the release of heavy metals. Wis. Stat. §293.50(2). "Pollution" in this part means any degradation of water quality that has resulted in the violation of an environmental law as determined in a legal proceeding, as evidenced by any penalty assessed, decision rendered, or stipulated agreement, etc. This limits the effectiveness of this provision.

Though never explicitly referring to "acid mine drainage," the statute and rules provide a number of parameters and submission requirements for tracking and management of mine discharges. For example, the mining permit application must include a plan of operations that details, *inter alia*, "[p]lans for collection, treatment and discharge of any water resulting from the operation" and "[g]round and surface water management techniques including provisions for erosion prevention and drainage control and a detailed water management plan showing source, flow paths and rates, storage volumes and release points." NR 132.07(3)(g) and (f), respectively. The statute requires DNR to set standards for all phases of mining operations regarding "[m]anagement, impoundment or treatment of all underground or surface runoff waters from open pits or underground prospecting or mining sites so as to prevent [...] pollution of surface or subsurface waters" Wis. Stat. §293.13(2)(c)(3). Those standards are discussed below.

Siting and buffers: DNR’s rules pertaining to site selection criteria and evaluation are highly specific. With regard to the purpose of site selection, “[t]he objective of the applicant’s site selection process for the mining facilities, and for the disposal or storage of wastes or materials produced by such activities, shall be the selection of a viable site that would result in the least overall adverse environmental impact.” NR 132.06(4)(a). This requires an identification of all viable sites and demonstration that the chosen alternative is the least environmentally damaging. NR 132.06(4)(b). The rules also provide special and extensive protection and regulation of siting with regard to wetland protection at NR 132.06(4). The use of wetlands (or use of other areas that would have a significant adverse impact on wetlands) for mining, storage or disposal activities is “presumed to be unnecessary” unless the applicant demonstrates a number of special circumstances, e.g. that the siting results in the least environmental impact as among alternative sites, and will minimize loss of wetlands functions. NR 132.06(4)(d).

In addition to these general siting criteria, Wisconsin restricts the use of specified areas for metallic mining. “To the extent practicable,” no one may construct, operate or maintain property for any mining-related construction in an “unsuitable” area, a floodplain, wetlands (unless specially permitted), or in any area that would result in noncompliance with other federal or state laws. NR 132.18. “Unsuitable” areas include any areas where surface mining would reasonable be expected to destroy or irreparably damage either habitat for endangered species or unique features of the land as determined by federal or state designation. NR 132.03(25). Such areas include all wilderness areas, wild and scenic rivers, national or state parks, historic landmarks, etc. *Id.* These prohibitions are subject, however, to an appeal process where the state may grant an exception, such as was done for the Flambeau mine. NR 132.19.

The siting criteria also include mandatory buffers for both mine sites and waste storage and treatment facilities. Mine sites may not be located within 1,000 feet of any navigable lake, pond or flowage, within 300 feet of a navigable river or stream, or “[w]ithin 1,000 feet of the nearest edge of the right-of-way of any of the following: any state trunk highway, interstate or federal primary highway; the boundary of a state public park; the boundary of a scenic easement purchased by the department or the department of transportation; the boundary of a designated scenic or wild river; a scenic overlook designated by the department by rule; or a bike or hiking trail designated by the United States congress or the state legislature; unless, regardless of season, the site is visually inconspicuous due to screening or being visually absorbed due to natural objects, compatible natural plantings, earth berm or other appropriate means, or unless, regardless of season, the site is screened so as to be aesthetically pleasing and inconspicuous as is feasible.” NR 132.18(b), (c), and (e).

Waste sites must have a buffer from navigable waters, floodplains, rights-of-way, the property line, and other protected areas. NR 182.07. Additionally, all mining and waste storage/treatment sites must meet the minimum distance requirements between the outer edge of the facility and the “design management zone,” which is a term of art under the water quality standards rules (NR 140) defining the boundary of the proposed activity or facility. NR 182.075(b).

Heap and dump leaching: The rules require disclosure and provide standards regarding leaching and leachate management in a number of places, from permit application through waste management. One of DNR’s primary functions as administrator of the mining program is “[i]dentification and prevention of pollution as defined in § 281.01(10) resulting from leaching

of waste materials.” Wis. Stat. §293.13(2)(b)(11). The application to mine must disclose potential leaching, NR 132.07(4)(k), and the reclamation plan must also meet a number of minimum standards, including that “[a]ll toxic and hazardous wastes, refuse, tailing and other solid waste shall be disposed of in conformance with applicable state and federal regulations.” NR 132.08(2)(a). Waste disposal sites are also subject to oversight of leachate and discharges. The location, design, construction and operation of the site must comply with point source discharge requirements, “including, but not limited to any point source discharge from a leachate” NR 182.02(6)(c).

Waste rock piles and storage: The proposed operating procedures (part of the application for a mining permit) must provide for the “[s]torage, loading and transportation of final products.” NR 132.07(3)(e). Piles and storage of waste are also more comprehensively dealt with in NR Ch. 182.

Tailings basin management: The mining plan must include details of the “nature, extent and final configuration of the proposed excavation and mining site including location and total production of tailings and other mining refuse” NR 132.07(2). Similarly, the proposed operating procedures must include “tailings production, handling and final disposition.” NR 132.07(3)(c). Finally, the rules require that tailings transport systems, if not buried, should be designed to provide for emergency tailings conveyance or storage should a pipeline break, and that the location of emergency spill areas must be consistent with the prevention of environmental pollution of surface waters. NR 132.17(13).

Particulate contributions to acidic conditions on and off site: Prospecting, mining and waste sites are all subject to groundwater standards set under NR 140. NR 182.075(1). These include a standard for sulfate concentration (NR140.12) and for alkalinity (“the preventative action limit shall be one pH unit above or below the pH of the background water quality.” NR 140.20(2)(a)). Further, a waste site permit application must characterize and analyze the nature of the waste including “[d]etermination of the acid producing characteristics of the wastes considering the acid producing content of the materials, the size, form of the acid producing material, and spatial distribution of its particles, the neutralizing effect of host materials; and the quality of leachate produced by similar wastes.” NR 182.08(2)(bi)(4)(a).

Transportation of acid-producing materials: The mine plan must include a plan for the transportation of the final product. NR 132.07(3)(e).

Long-term remediation and short and long-term acid production potential in pit and storage areas: A reclamation plan is a basic element of application for the permit to prospect (§293.35(3)) or mine (§293.37(3)). These reclamation plans must meet the minimum standards set under §293.13(c), which include “disposal of all toxic and hazardous wastes, refuse, tailings and other solid waste in solid or hazardous waste disposal facilities licensed under ch. 289 or 291 or otherwise in an environmentally sound manner.” Further, the waste site permit application must include a “[d]etermination of the acid producing characteristics of the waste [...] and [d]etermination of the leaching potential of the wastes and determination of the composition of the resulting leachate.” NR 182.08(2)(bi)(4)(b). Among the minimum design and operational requirements for mine waste sites, “Provisions shall be made for collection and treatment of

leachate for all sites designed to contain leachate.” NR 182.11(1)(o). In addition, the applicant should “consider” that “[m]ining waste disposal should minimize the discharge of environmental pollutants to the groundwaters of the state.” NR 182.11(2)(g). Finally, NR 132.17 contains a series of requirements for design and siting to ensure protection of surface and groundwater from contamination by mine activities and wastes. This is more or less a precursor regulation analogous to that found in NR 182 covering mine waste management.

2. The state or province regulates and exhibits comprehension of the structural integrity of mines, including thorough rock mechanics review, lateral support issues and impacts to adjacent lands.

While prohibiting activities or situation that threaten subsidence or caving, Wisconsin’s regulations do not provide much guidance or technical review of mine construction. A mining permit application will be denied if the proposed activity may “reasonably be expected to create” landslides, subsidence, or other significant structural hazards to nearby structures, roads, or public facilities. NR 132.10, and see Wis. Stat. § 293.13(2)(d). Further, the applicant’s reclamation plan must include evidence that “[a]dequate measures shall be taken to prevent significant surface subsidence, but if such subsidence does occur, the affected area shall be reclaimed.” NR 132.08(1)(e).

3. The state or province uses an ecosystem-based approach to mining regulation and employs comprehensive and integrated regulation and analysis of air, surface water, ground water and aquifer impacts, and considers all discharges synergistically to determine impacts on bioaccumulative chemicals of concern.

Whether all impacts will be considered in an integrated, synergistic fashion remains to be seen; while it could happen in practice, there is no regulatory framework or requirement that they be handled this way. Though air, water, and other issues are all mentioned as part of the EIS process, there is no clear requirement that they be considered synergistically. There is also no framework set up in the statute or regulations to guarantee that different effects will be considered synergistically. Through the application and enforcement/monitoring phases, the different impact areas (air, water, waste) are handled by different groups though all are housed within the DNR and all are under a coordinated “team” approach for any given project. The team is led by an appointed project manager, usually the person who was coordinating the EIS.

4. Regulations are applicable statewide or province-wide.

There are no geographic exceptions to application of the law or regulations.

5. The state or province regulates exploration to ensure protective capping and site remediation, and a thorough review process determines whether exploration is permitted based on the location’s appropriateness for future mining.

Exploration is a permitted activity covered through a separate section in the rules, NR Ch. 130. The state issues a prospecting permit when the applicant submits a brief description of the proposed activity, information regarding its finances, and posts a bond. Recently (in the last year), DNR has expanded these requirements to include a drilling plan detailing the exact location of the proposed drilling, though this is not yet memorialized in the rules. The permit will be denied if DNR finds the proposed activity will not include a list of standards (§293.13(2)(b) and (c)), which include a plan for capping and remediation of the site. However, there is no

mention that the department must consider the location's appropriateness for future activities, nor is there an environmental review of the proposed exploration commensurate with that done for a full mining operation.

6. The state or province has an adequate monitoring program that allows for proactive, protective measures to be taken prior to any release or accident.

Wisconsin's monitoring requirements are relatively detailed, but do not require much in the way of independent, regular, mandatory monitoring. An application for a prospecting or mining permit must include a proposed monitoring plan (NR 131.06(3)(d) and 132.06(3)(d), respectively) and monitoring criteria must be included in both prospecting and mining permits. The monitoring action level (requiring follow-up action by the permittee) is set at a minimum level: "If the analyses of samples indicate that the quality of the groundwater is statistically significantly different from either baseline or background, the owner shall notify the department immediately." NR 132.11(2)(c). While set at a reasonably sensitive level, the system is based on the permittee's self-monitoring and self-reporting instead of independent and objective state monitoring, and there is no follow-up prescribed action or procedure for the department to follow in response. DNR has the discretion to do additional independent monitoring, but no mandate to do so. NR 131.11, 132.11. Also, DNR has "visitorial" powers to enter and inspect the mine site at any time, and the permittee cannot refuse such entry. §293.86; NR 132.14.

The waste management operation permitted in NR 182 is also subject to monitoring requirements by the Department: groundwater monitoring wells installed by the permittee are mandatory, and leachate monitoring and other types of monitoring are discretionary with the Department. NR 182.13(2). The monitoring frequency and parameters set for waste management sites is more explicit and exacting in the rules than that set for the mine site itself. See NR 182.13(2)-(5).

7. The state or province requires mining and cleanup operations to comply with all applicable state, federal and tribal regulations.

An application for a prospecting or mining permit must list in the application all "anticipated permits, approvals, certifications and licenses for the proposed prospecting project required by federal, state and local agencies," though it does not require actual compliance with these prior to the application being read or permit granted. NR 131.05(3)(g). When another state or federal standard "specifically regulates in whole an activity also regulated under [Chapter 293] the other state or federal statutes or rules shall be the controlling standard." Wis. Stat. 293.93. This could be rewritten as a requirement of compliance, but is currently only a recognition of another laws' potential precedence.

Some of the tribes in Wisconsin have established their own water quality standards. However, adherence to these standards is not prescribed in Wis. Stat. § 293.93. Tribes must be informed of applications, but no state law requires tribal consent or adherence to tribal regulations or laws prior to granting permits.

8. The state or province requires adequate up-front financial assurance to cover costs for worst-case scenario failures, contingency plan implementation.

Wisconsin requires both a reclamation bond and also an irrevocable trust as financial assurance for both regular contingency plan implementation and worst-case-scenario failures.

First, Wisconsin requires the permit applicant to post a bond based on the projected cost for the department to reclaim the site (as proposed in the reclamation plan) at any phase in the project. This is not a “worst case scenario” insurance policy, but rather takes care of the less-egregious situation of a mine operator failing to complete the required reclamation on its own and the state stepping in to take up the slack. Wis. Stat. 293.51, NR 132.09(2).

Second, the applicant must set up an irrevocable trust agreement in which a fund is created and regularly paid into by the permit holder. NR 132.085. This fund is intended to finance preventative and remedial activities necessitated by unforeseeable “worst case” environmental damages not addressed by the regular remediation plan. The size and timing of payments into the fund depends on the stage of the project.

9. Financial assurance requirements reach beyond the term of the mining and waste management permits to encompass long-term water treatment needs, etc.

The reclamation bond will be reduced to 10% or 20% of the total potential cost of reclamation after DNR grants a certificate of completion of all reclamation activities, and this amount will be entirely released only after 20 years. NR 132.13. The trust fund does not apply to “long-term care” activities but as part of the reclamation plan (NR 132.085(4)(e)), the applicant must provide proof of financial ability to be responsible for the mine waste facility’s “long term care” for 30 years after closure. NR 182.17(2)(b). The applicant’s successor in interest will also be bound to this responsibility. NR 182.17(2)(c). The mine waste facility’s long term care is part and parcel of the reclamation plan in these sections.

10. A comprehensive web of effective, interactive regulations protect surface water, ground water, air, land, wildlife habitat, wetlands, endangered species and assess impacts on global warming; mining operations are not exempted.

Mining operations are not exempt from any environmental law, including air and water quality. All review and processing is done within DNR’s various sub-departments and is coordinated through a single project manager. However, whether this in practice will result in synergistic or interrelated review and management of effects remains to be seen; there is no framework for such coordination set up in the regulations.

11. An environmental review process that uses ecological values and carrying capacity is required and is applied by the state or province to determine where mining will be allowed.

Wisconsin has the most detailed list of site characteristics and “suitability” analysis of any jurisdiction surveyed, and is useful therefore as a model. The statute and regulations call for a high level of scrutiny for site analysis, with specific regard given to the environmental attributes of a proposed site. A site is deemed “unsuitable” for a prospecting or mining permit when it has been identified as a protected area in the statute, is endangered species habitat, or is an area “of a type designated as unique or unsuitable for surface mining.” See NR 131.03(23), 132.03(23). Thus, the rules give the department the leeway to make such a determination of unsuitability (and thereupon deny an application), but do not require it necessarily.

A prospecting permit will not be issued if DNR deems the site legally “unsuitable” for mining activities (§293.45(1)) and even if a prospecting permit is issued, DNR must *again* consider whether the area is “suitable” when making a decision on the mining permit application

(§293.49(1)(a)(3)) and must deny an application for operations in an unsuitable area. “Unsuitability” is defined by §293.01(28) as follows:

“Unsuitability” means that the land proposed for prospecting or surface mining is not suitable for such activity because the prospecting or surface mining activity itself may reasonably be expected to destroy or irreparably damage either of the following:

(a) Habitat required for survival of species of vegetation or wildlife designated as endangered through prior inclusion in rules adopted by the department, if such endangered species cannot be firmly reestablished elsewhere.

(b) Unique features of the land, as determined by state or federal designation and incorporated in rules adopted by the department, as any of the following, which cannot have their unique characteristic preserved by relocation or replacement elsewhere:

1. Wilderness areas.
2. Wild and scenic rivers.
3. National or state parks.
4. Wildlife refuges and areas.
5. Archaeological areas.
- 5m. Listed properties, as defined in s. 44.31 (4).
6. Other lands of a type designated as unique or unsuitable for prospecting or surface mining.

The regulations also add a list of 173 protected “scientific areas” to the definition of unsuitability (NR 131.3(23) and 132.3(23)).

12. Numeric standards or determination processes for setting numeric standards are consistently applied to all discharges in every media (water, air, etc.); standards apply to all contaminants from all media and there are standards specifically applicable to sulfide mining contaminants (sulfides, heavy metals, chlorine, etc.).

There are no numeric standards set specifically for nonferrous metallic mining operations. Standards are set on a case-by-case basis, developed in the permitting process when considering background data.

13. The state or province requires holistic mine plans, including factors like: stability, workers’ safety; long-term viability of the mine (not allowing just high-grading), economic plans for communities’ long-term health, reasonable royalties, past performance of applicant and community priorities as expressed in Master Plans, zoning, etc.

Wisconsin does not require non-environmental impact protection in mine plans. See NR 132.07. While past performance of the applicant and local government involvement are features of the EIS and application review, they are not included in the mine plan per se. See Wis. Stat. §293.39(2)(f), NR 131.06(3)(g), 132.06(3)(g) (respectively).

14. Mining sites must be returned to a functioning ecosystem that does not require perpetual care post-mining.

A reclamation plan must be submitted as part of each application for a prospecting or mining permit, but the state does not require a return to a “functioning ecosystem” necessarily, or even to the pre-hoc scenario. Wis. Stat. Ann. §§ 293.35(2), 293.37(3). Instead, “[i]f it is

physically or economically impracticable or environmentally or socially undesirable for the reclamation process to return the affected area to its original state, the plan shall set forth the reasons therefor and shall discuss alternative conditions and uses to which the affected area can be put.” *Id.*

The administrative rules echo this approach: the reclamation plan should provide “the greatest feasible protection to the environment” (NR 132.03(21)), but the reclamation standards themselves do not use a functioning ecosystem as the measure of success. They rather use “conformance with applicable state and federal statutes and regulations” as the measure of completeness and modify expectations with “to the extent practicable.” NR 132.08(2). The standards also leave room for the mine to be reclaimed in a way that will not yield a “functioning ecosystem” or even a “clean” or pre-hoc environment, by restating the statutory loophole noted above: “If it is physically or economically impracticable or environmentally or socially undesirable for the reclamation process to return the affected area to its original state, the plan shall set forth the reasons therefor and shall discuss alternative conditions and uses to which the affected area can be put.” NR 132.08(3).

15. The state or province requires that all impacts, on and off site, be analyzed, assessed and included in permitting decisions.

Wisconsin requires all impacts to be considered in the permit decision, both on-site and off-site (all effects to public health, safety and welfare, and effects to all potentially affected communities). Wis Stat. §293.49(1)(a). All impacts are also assessed in the EIS. *See* NR 150, specifically NR 150.22 (“Preparation and content of the EA or EIS”).

16. The state or province requires a cumulative impacts analysis that includes impacts from any beneficiation or transportation of the facility’s ore in the state or province.

Cumulative impacts are assessed through the applicant’s EIS, and should include both beneficiation and transportation activities.³⁴ This requirement is *not*, however, made explicit in the regulations. Wisconsin requires additional special cumulative impacts analysis for wetlands protection; i.e. whether there are cumulative effects of piecemeal alterations to a wetland ecosystem, or cumulative effects from the proposed activity in concert with prior activities on the site. Both prospecting and mining permit applicants must address these wetlands impacts. NR 131.06(4)(g), NR 132.06(4)(g).

17. The state or province requires contingency plans for any potential failures.

A contingency plan is required for each stage of permitting for a proposed mine: (1) the mine prospecting permit application (NR 131.07(2)(h-i)), (2) the mining permit application (NR 132.07(3)(i-j)), and (3) waste management and disposal operations (NR 182.08(i)). The mining rules require both a risk assessment of “possible accidental health and environmental hazards potentially associated with the mine operation” and contingency measures with respect to the risks, and measures for notifying the public and government agencies of potentially hazardous conditions. NR 132.07(3)(i-j).

³⁴ Larry Lynch, Wisconsin DNR (personal communication with author, July 12, 2011).

D. ONTARIO

Summary:

Currently, there is no permit approval required for mining in Ontario. Assessment of the impact of potential mining activity is conducted through an inadequate, uncoordinated environmental assessment process. There is a requirement that prior to an operation commencing, a closure plan must be submitted. Before the Ministry of Northern Development and Mines accepts the closure plan, there is a process to receive input from the public. And there are very detailed requirements of the closure plan that are specific to sulfide mining.

Overall grade: Fair/Poor

1.	The state or province regulates a broad array of issues unique to sulfide mining, including: production, transport and fate of acid mine drainage and other contaminants; siting and buffers; heap and dump leaching; waste rock piles and storage; tailings basin management; particulate contributions to acidic conditions on and off site; transportation of acid-producing materials; long-term remediation and short and long-term acid production potential in pit and storage areas.	SOME
2.	The state or province regulates and exhibits comprehension of the structural integrity of mines, including thorough rock mechanics review, lateral support issues and impacts to adjacent lands.	SOME
3.	The state or province uses an ecosystem-based approach to mining regulation and employs comprehensive and integrated regulation and analysis of air, surface water, ground water and aquifer impacts, and considers all discharges synergistically to determine impacts on bioaccumulative chemicals of concern.	NO
4.	Regulations are applicable statewide or province-wide.	NO
5.	The state or province regulates exploration to ensure protective capping and site remediation, and a thorough review process determines whether exploration is permitted based on the location's appropriateness for future mining.	NO (changes pending)
6.	The state or province has an adequate monitoring program that allows for proactive, protective measures to be taken prior to any release or accident.	SOME
7.	The state or province requires mining and cleanup operations to comply with all applicable state, federal and tribal regulations.	NO
8.	The state or province requires adequate up-front financial assurance to cover costs for worst-case scenario failures, contingency plan implementation.	SOME
9.	Financial assurance requirements reach beyond the term of the mining and waste management permits to encompass long-term water treatment needs, etc.	SOME
10.	A comprehensive web of effective, interactive regulations protect surface water, ground water, air, land, wildlife habitat, wetlands, endangered species and assess	NO

	impacts on global warming; mining operations are not exempted.	
11.	An environmental review process that uses ecological values and carrying capacity is required and is applied by the state to determine where mining will be allowed.	NO
12.	Numeric standards or determination processes for setting numeric standards are consistently applied to all discharges in every media (water, air, etc.); standards apply to all contaminants from all media and there are standards specifically applicable to sulfide mining contaminants (sulfides, heavy metals, chlorine, etc.).	SOME
13.	The state or province requires holistic mine plans, including factors like: stability, workers' safety, long-term viability of the mine (not allowing just high-grading), economic plans for communities' long-term health, reasonable royalties, past performance of applicant and community priorities as expressed in Master Plans, zoning, etc.	NO
14.	Mining sites must be returned to a functioning ecosystem that does not require perpetual care post-mining.	SOME
15.	The state or province requires that all impacts, on and off site, be analyzed, assessed and included in permitting decisions.	NO
16.	The state or province requires a cumulative impacts analysis that includes impacts from any beneficiation or transportation of the facility's ore in the state or province.	SOME
17.	The state or province requires contingency plans for any potential failures.	NO

Discussion:

1. The state or province regulates a broad array of issues unique to sulfide mining, including: production, transport and fate of acid mine drainage and other contaminants; siting and buffers; heap and dump leaching; waste rock piles and storage; tailings basin management; particulate contributions to acidic conditions on and off site; transportation of acid-producing materials; long-term remediation and short and long-term acid production potential in pit and storage areas.

Production, Transport, and Fate of Acid Mine Drainage and Other Contaminants:

A number of specific items are mandated for reporting within closure plan pursuant to section 11 of the *Mine Development and Closure Regulation*³⁵. For example, a closure plan must include:

- (vi) details of the production, handling and disposal of any tailings on the site, including the physical and chemical nature of the tailings, an assessment of the potential for metal leaching and acid mine drainage in accordance with the Code, the rate of production of tailings, methods of handling tailings, the location, size and nature of any tailings impoundment and treatment areas and a surface plan of

³⁵ *Mine Development and Closure Under Part VII of the Act*, O. Reg. 240/00, available on-line: http://www.e-laws.gov.on.ca/html/regs/english/elaws_regs_000240_e.htm.

legible scale showing the location of any such areas with engineering details of any impoundment structures.

(vii) details of the production, handling, storage and disposal of waste rock, ore, concentrate and overburden, including the physical and chemical nature of the materials, an assessment of the potential for metal leaching and acid mine drainage in accordance with the Code, the rates of production of such material, methods of handling and the location, size and nature of any storage or disposal areas and a surface plan of legible scale showing the location of any storage or disposal areas.³⁶

The Code referred to above is the Mine Rehabilitation Code of Ontario.³⁷ Pursuant to the Code, the mine proponent must “determine the potential for significant metal leaching (ML) or acid rock drainage (ARD)” and, if it is determined that there would be significant metals leaching or acid rock drainage, “ensure the development and implementation of effective prevention, mitigation and monitoring strategies.”³⁸ Also, the proponent must undertake a program (consistent with prescribed guidelines) to have a qualified professional engineer or professional geoscientist or agrologist sample all materials remaining on site that were excavated, exposed, or otherwise disturbed by mining activities.³⁹ Where sampling indicates potential for ARD, a management plan must be developed to ensure that the materials do not adversely affect the quality of the environment.⁴⁰ When a mine is put into a state of inactivity or is closed out, the proponent must, in accordance with the management plan, deal with all “materials, or conditions created as a result of mining, that produce or may produce acid rock drainage or metal leaching.”⁴¹ Funded by Natural Resources Canada and the Canadian Mining Association, the Mine Environmental Neutral Drainage (MEND) Program asserts to have reduced ARD liability by at least \$400 million on an investment of \$17.5 million.⁴²

Siting and Buffers: Mines can generally be sited on any public (Crown) lands and private lands unless the lands have been withdrawn from mining by the Minister of Northern Development, Mines and Forestry,⁴³ are part of a provincial park or conservation reserve,⁴⁴ or are required for the development of water power, highway, or another public interest purpose.⁴⁵ No surface mines can be sited within 45 meters of a road or highway without the written consent of the

³⁶ *Mine Development and Closure Under Part VII of the Act*, O. Reg. 240/00, Schedule 2, item 5.

³⁷ *Mine Development and Closure Under Part VII of the Act*, O. Reg. 240/00, Schedule 1.

³⁸ *Mine Development and Closure Under Part VII of the Act*, O. Reg. 240/00, Schedule 1, section 56.

³⁹ *Mine Development and Closure Under Part VII of the Act*, O. Reg. 240/00, Schedule 1, sections 56-59.

⁴⁰ *Mine Development and Closure Under Part VII of the Act*, O. Reg. 240/00, Schedule 1, sections 56-59.

⁴¹ *Mine Development and Closure Under Part VII of the Act*, O. Reg. 240/00, subsections 23(2)(12) and 24(2)(15).

⁴² <http://www.mend-nedem.org/Default-e.aspx>.

⁴³ *Mining Act*, R.S.O. 1990, c. M.14, section 35.

⁴⁴ *Mining Act*, R.S.O. 1990, c. M.14, section 31; *Provincial Parks and Conservation Reserves Act, 2006*, S.O. 2006, c. 12, section 16.

⁴⁵ *Mining Act*, R.S.O. 1990, c. M.14, subsection 30(1).

Minister of Transportation.⁴⁶ The Ontario *Environmental Assessment Act*⁴⁷ applies to public (Crown) undertakings and to designated private-sector undertakings. The proponent of any undertaking can enter into an agreement under section 3.0.1 of the Act with the Minister of the Environment to have an environmental assessment done voluntarily. Currently, mining is exempted from environmental assessment pursuant to two “Declaration Orders” (“DO”): Declaration Order MNDM-3 (also known as MNDM 3/4, formerly MNDM 3/3) and Declaration Order MNDM-4/2 (formerly MNDM-4).⁴⁸ There is a proposed Terms of Reference for an environmental assessment currently submitted by the Ministry of Northern Development and Mines (“MNDM”) to the Ministry of the Environment for approval. The proposal only covers the disposition of public (Crown) resources and rehabilitation activities. Mining leases and licences are not subject to the Ontario *Environmental Assessment Act* because they are statutory entitlements (i.e. MNDM has no discretion to refuse these if the statutory requirements have been met).

The purpose of MNDM-3/4 (originally MNDM-3, which has been extended three times) is to allow the Ministry of Northern Development and Mines to grant rights, title and interests to Crown mining lands and mining rights without having to conduct an individual environmental assessment in each case. The MNDM’s coverage under this DO does not include mine claim staking or leasing of mining claims as these are not the MNDM’s activities but are private sector undertakings which are not subject to the *Environmental Assessment Act*. Under the DO, the MNDM assesses whether there are potential environmental impacts; if there are none, the approval is given. Public notice is to be given and comments are to be solicited. If there are potential environmental effects, the Ministry of the Environment is to be notified. It is possible that certain components of a mine, such as access roads or portable generators, could be subject to an environmental assessment process, if they are not administered by the MNDM. In addition, the Minister of the Environment can recommend that the project be designated a major commercial or business enterprise, which would subject the undertaking to an environmental assessment process.

The purpose of MNDM-4/2 (formerly MNDM-4) is to ensure that there are no delays in rehabilitating sites where there is the possibility of hazardous contaminants being discharged to the environment, or the exposure of the public to personal safety hazards. This may be beneficial in terms of the sulfide mining criteria, in that it speeds up the rehabilitation process to minimize the ARD and other contamination that occurs before a site is rehabilitated. The DO requires notice of the project to be posted for at least 30 days before implementation. Under the DO,

⁴⁶ *Mining Act*, R.S.O. 1990, c. M.14, section 34.

⁴⁷ R.S.O. 1990, c. E.18.

⁴⁸ Declaration Order MNDM-3 is set to expire on December 31, 2012. MNDM-4/2 was extended on June 4, 2009 and will expire on December 31, 2012. Both Declaration orders exempt the Ministry of Northern Development and Mines from complying with section 5 of the *Environmental Assessment Act*, R.S.O. 1990, c. E.18. The authority for making these Declaration Orders is given to the Minister of the Environment under subsection 3.1(3) of the *Environmental Assessment Act*, R.S.O. 1990, c. E.18.

rehabilitation must still comply with the Mine Rehabilitation Code and a number of other conditions.

A mining project may be subject to a federal environmental assessment if it includes an activity prescribed by the regulations. For example, where a “Harmful Alteration, Disruption, of Destruction” of fish habitat authorization is required from the federal Department of Fisheries and Oceans, or where exploration or other activities require a permit under the *Indian Mining Regulations*, a federal environmental assessment must occur.⁴⁹

In all instances where environmental assessment is required, the standard is to ensure no significant environmental impacts that cannot be mitigated. There is no legal requirement that all aspects of the project be considered in one comprehensive assessment. It is possible for both levels of government to voluntarily agree to harmonize any federal and provincial environmental assessment requirements. Comprehensive assessment of all aspects of a project only occur in rare cases where the federal and provincial governments voluntarily agree to have the full project assessed by an independent third party called a Joint Review Panel (“JRP”). Some recent JRPs in Canada have employed sustainability criteria. For example, the Kemess North Gold-Copper Mine (Duncan Lake, BC)⁵⁰ and the Whites Point Quarry and Marine Terminal Project (Digby Neck, NS)⁵¹ JRPs both employed sustainability criteria including: environmental stewardship, economic benefits and costs, social and cultural benefits and costs, fair distribution of benefits and costs, present vs. future generations (Kemess) and public involvement, traditional community knowledge, ecosystem approach, sustainable development, precautionary principle (Whites Point). As can be seen, each JRP will develop the guiding criteria/principles independently. And the recommendations resulting from a JRP is only advice to government and need not be followed. The first ever JRP for an Ontario mine has been commenced to assess the proposed Marathon Platinum Group Metals and Copper Mine Project (August 2011, Environmental Assessment Registry Number 10-05-54755).

Heap and Dump Leaching; Waste Rock Piles and Storage: “Process effluent” (which can include effluent from waste rock storage) over a specified quantity requires a Certificate of Approval pursuant to Ontario’s *Environmental Protection Act*. Limits are set for specific parameters, including cyanide, copper, lead, nickel, zinc, and arsenic.⁵² Similarly, under the federal *Fisheries Act*, waste rock can be deposited to a Tailings Impoundment Area, if the concentrations of “deleterious substances” do not exceed the limits set out in regulation.⁵³

⁴⁹ *Canadian Environmental Assessment Act*, S.C. 1992, c. 37; *Law List Regulations*, SOR/94-636; *Inclusion List Regulations*, SOR/94-637.

⁵⁰ All documentation is available on-line: www.ceaa.gc.ca/052/details-eng.cfm?pid=3394#decision.

⁵¹ All documentation is available on-line: www.ceaa.gc.ca/default.asp?lang=En&n=D67F0296-1.

⁵² *Effluent Monitoring and Effluent Limits – Metal Mining Sector*, O. Reg. 560/94, Schedule 1 – Process Effluent Limits and Monitoring Frequency.

⁵³ *Metal Mining Effluent Regulations*, SOR/2002-222, s. 5 and Schedule 4 – Authorized Limits of Deleterious Substances.

When a mine is closed, the proponent must address the hydrogeology of the mine site through a site ground water characterization study, which must indicate the location of waste rock dumps, waste disposal sites, fuel storage areas, and chemical storage areas, among other things.

A similar indication of the location of existing waste rock, ore, concentrate and overburden piles must occur in assessing the ARD and metal leaching potential of a mine that is being closed.⁵⁴

Tailings Basin Management: In order to ensure long-term physical stability of tailings dams and other containment structures, the Canadian Dam Safety Association “Dam Safety Guidelines” must be considered by the proponent in constructing such dams and structures, and details of the consideration given must be included in the closure plan.⁵⁵

Tailings dams or other structures for impoundment of tailings must be designed in accordance with good engineering practice by a professional engineer, built in accordance with that design, and maintained to provide stability against static and dynamic loading.⁵⁶

An owner or operator of mine may deposit waste rock or effluent containing a substance deleterious to fish into a tailing impoundment area (TIA). A TIA can be a natural water body or place designated in Schedule 2, or it can be a disposal area confined by anthropogenic or natural structures or by both, other than a disposal area that is part of a natural water body frequented by fish. If the TIA is a natural water body, the owner or operator must submit a compensation plan to the Minister of Fisheries and Oceans, and that plan must be approved, before a deleterious substance is deposited into a TIA that is added to Schedule 2; this provision is designed to offset the loss of fish habitat that will occur. If the requirements of subsections 27(2), (3), and (4) are met, the Minister must approve the plan.⁵⁷

The provincial *Lakes and Rivers Improvement Act* and associated regulations govern the construction of dams, including tailings dams. The Ontario Minister of Natural Resources must approve the location and specifications of any dam to be constructed in a lake or river.⁵⁸

A Director of the Ministry of the Environment must approve any sewage works before these can be constructed and operated. This provision only applies to sewage works with design

⁵⁴ *Mine Development and Closure Under Part VII of the Act*, O. Reg. 240/00, Schedule 1 (Mine Rehabilitation Code), Part 6 (ss. 50-55), Part 7 (ss. 56-59).

⁵⁵ *Mine Development and Closure Under Part VII of the Act*, O. Reg. 240/00, Schedule 1 (Mine Rehabilitation Code), Part 4 (ss. 35-36).

⁵⁶ *Mines and Mining Plants*, R.R.O. 1990, Reg. 854, s. 7, enacted pursuant to *Occupational Health and Safety Act*, R.S.O. 1990, c. O.1.

⁵⁷ *Metal Mining Effluent Regulations*, SOR/2002-222, ss. 5(1), 27.1, Schedule 2.

⁵⁸ *Lakes and Rivers Improvement Act*, R.S.O. 1990, c. L.3.

capacity over 10,000 L per day, but does not apply where sewage is not to drain or discharge directly or indirectly into a water body or watercourse or a storm sewer.⁵⁹

Particulate Contributions to Acidic Conditions On and Off Site: Section 9 of Ontario's *Environmental Protection Act* provides that any plant or structure emitting contaminants into the air requires a certificate of approval from the Director to do so.⁶⁰ Section 20 of the *Air Pollution – Local Air Quality Regulation* states that no facility of a sector included in Schedule 4 shall exceed the standards for discharge of contaminants as set out in Schedule 3. The section applies to discharges that occur on or after February 1, 2010, or to discharges from facilities the construction of which began after November 30, 2005, and no application for a certificate of approval was made on or before that day for the facility. Metal ore mining is a prescribed sector in Schedule 4, as is non-ferrous metal (except aluminum) smelting and refining. The remainder of non-ferrous metal mining operations will become subject to the standards in Schedule 3 on February 1, 2013.⁶¹ Metal and non-metal mining operations are subject to the regulation, which requires facilities to report emissions exceeding a threshold set out in Tables 2A and 2B of the Ministry of the Environment publication entitled "Step by Step Guideline for Emission Calculation, Record Keeping and Reporting for Airborne Contaminant Discharge." Particulate matter is one of the contaminants that must be tracked.⁶²

Transportation of Acid-Producing Materials: The transportation of hazardous and toxic chemicals is governed by the Canada-Ontario Agreement Respecting the Administration of the Transportation of Dangerous Goods Act⁶³ and both federal and provincial legislation.⁶⁴ There are no specific regulations that apply to the transporting of acid-producing materials.

Long-Term Remediation: Part VII of Ontario's *Mining Act*, which is entitled "Rehabilitation of Mining Lands," applies to surface and underground mining of minerals and metallic minerals and to advanced exploration on mining lands.⁶⁵ A proponent is required to take all reasonable steps to progressively rehabilitate a site whether or not closure has commenced or a closure plan has been filed. Progressive rehabilitation is defined as "rehabilitation done continually and sequentially during the entire period that a project or mine hazard exists." Rehabilitate is defined

⁵⁹ *Ontario Water Resources Act*, R.S.O. 1990, c. O.40, section 53.

⁶⁰ *Environmental Protection Act*, R.S.O. 1990, c. E.19, section 9.

⁶¹ *Air Pollution – Local Air Quality*, O. Reg. 419/05, s. 20, Schedules 3, 4, enacted pursuant to *Environmental Protection Act*, R.S.O. 1990, c. E.19.

⁶² *Airborne Contaminant Discharge Monitoring and Reporting*, O. Reg. 127/01, enacted pursuant to *Environmental Protection Act*, R.S.O. 1990, c. E.19.

⁶³ Canada-Ontario Agreement Respecting the Administration of the Transportation of Dangerous Goods Act is available on-line: www.tc.gc.ca/eng/tdg/clear-agreements-on-238.htm.

⁶⁴ *Transportation of Dangerous Goods Act*, 1992, S.C. 1992, c. 34 and *Dangerous Goods Transportation Act*, R.S.O. 1990, c. D.1; *Environmental Protection Act*, R.S.O. 1990, c. E.19.

⁶⁵ *Mining Act*, R.S.O. 1990, c. M.14, subsection 139(2).

as measures taken to restore the use or condition of the site to its former use or condition (i.e. prior to mining) or is made suitable for a use that the Director sees fit.⁶⁶

Any person can apply for a permit to rehabilitate a mine hazard on Crown land, but obtaining a permit does not require that person to rehabilitate the hazard.⁶⁷ However, if they do rehabilitate the hazard, this must be done in accordance with a rehabilitation plan.⁶⁸ Once rehabilitation pursuant to a permit is underway, orders under the *Ontario Water Resources Act* (ss. 16.1, 16.2, 16.3, 31, 32, 61) and the *Environmental Protection Act* (ss. 7, 8, 18, 43, 157.1, 97) cannot be made.⁶⁹

Closure plans are required for many advanced exploration and mining operations.⁷⁰ Filed certified closure plans are mandatory and must be complied with; rehabilitation measures which are required are set out in the Mine Rehabilitation Code included in O. Reg. 240/00.⁷¹

The Director may order the proponent on whose lands exists a mine hazard to file a certified closure plan to rehabilitate the hazard. Failure to file a plan enables the Crown to rehabilitate the hazard.⁷² The proponent cannot be required to file a closure plan pertaining to a mine hazard that was created by someone other than the proponent and which the proponent has not materially disturbed.

Where a mine hazard is likely to cause an immediate and dangerous adverse effect and rehabilitation is practical, immediate rehabilitation of the hazard can be required of the proponent.⁷³ Again, rehabilitation cannot be required where the hazard was not created or materially disturbed by the proponent.

Short and Long-Term Acid Production Potential in Pit and Storage Areas: During operations, the Ontario Ministry of the Environment requires a Certificate of Approval for the “sewage works.”⁷⁴ If out of compliance with the Certificate of Approval, enforceable penalties can be applied.⁷⁵ After operations have ceased, the Ontario Ministry of Northern Development and Mines oversees rehabilitation, which includes metal leaching and acid rock drainage requirements.⁷⁶

⁶⁶ *Mining Act*, R.S.O. 1990, c. M.14, section 139.1.

⁶⁷ *Mining Act*, R.S.O. 1990, c. M.14, section 139.2.

⁶⁸ *Mining Act*, R.S.O. 1990, c. M.14, subsection 139.2(6).

⁶⁹ *Mining Act*, R.S.O. 1990, c. M.14, subsection 139.2(7).

⁷⁰ *Mining Act*, R.S.O. 1990, c. M.14, subsection 140(3).

⁷¹ *Mining Act*, R.S.O. 1990, c. M.14, sections 141(2), 143.

⁷² *Mining Act*, R.S.O. 1990, c. M.14, section 147.

⁷³ *Mining Act*, R.S.O. 1990, c. M.14, section 148.

⁷⁴ *Ontario Water Resources Act*, R.S.O. 1990, c. O.40, section 53.

⁷⁵ *Ontario Water Resources Act*, R.S.O. 1990, c. O.40, sections 107, 108.

⁷⁶ *Mine Development and Closure Under Part VII of the Act*, O. Reg. 240/00, Schedule 1 (Mine Rehabilitation Code), Part 7.

2. The state or province regulates and exhibits comprehension of the structural integrity of mines, including thorough rock mechanics review, lateral support issues and impacts to adjacent lands.

The proponent is required to submit notice of project status under s. 140, 141, or 144 of the *Mining Act* prior to the commencement or resumption of advanced exploration or mining operations.⁷⁷ This notice must include information on the uses of the land and water adjacent to the site. Some definitions also suggest that adjacent lands would be considered in the determination of impacts. “Operations area” is defined to include cleared or disturbed areas that are adjacent to the land that has been used in conjunction with a mining activity, including (given the purpose of the enabling legislation) adjacent waters.⁷⁸ The owner or operator of a mine must identify final discharge points for effluent.⁷⁹

A closure plan must include details regarding the current land use of lands immediately adjacent to the site that may be affected by the project; details of water flowing through and receiving flow from the site; details on ground waters within and beyond the site boundaries that may be affected by the project; and details regarding terrestrial and aquatic plant and animal life that may be affected by the project.⁸⁰

Part 1 of the Mine Rehabilitation Code deals with preventing access to the mine after closure.⁸¹ Part 2 deals with rehabilitation of open pits, including considerations such as rock stability.⁸² Part 3 deals with the stability of crown pillar and room and pillar operations, and is concerned with the long term stability of the mine site.⁸³ Possible environmental impacts caused by a collapse must be included in a study to assess the stability of the mine. Part 8 deals with physical stability monitoring, and any site that is determined not to be physically stable must be remediated “forthwith.”⁸⁴

Sections 18 and 19 of the *Ontario Health and Safety Act* regulations deal with sealing entrances to mines upon termination of mining and the thickness of pillars between adjacent underground operations, respectively.⁸⁵

⁷⁷ *Mine Development and Closure Under Part VII of the Act*, O. Reg. 240/00, subsection 5(3)(c).

⁷⁸ *Metal Mining Effluent Regulations*, SOR/2002-222, subsection 1(1).

⁷⁹ *Metal Mining Effluent Regulations*, SOR/2002-222, section 9.

⁸⁰ *Mine Development and Closure Under Part VII of the Act*, O. Reg. 240/00, Schedule 2, Item 4.

⁸¹ *Mine Development and Closure Under Part VII of the Act*, O. Reg. 240/00, Schedule 1 (Mine Rehabilitation Code), Part 1 (sections 1-17).

⁸² *Mine Development and Closure Under Part VII of the Act*, O. Reg. 240/00, Schedule 1 (Mine Rehabilitation Code), Part 2 (sections 18-27).

⁸³ *Mine Development and Closure Under Part VII of the Act*, O. Reg. 240/00, Schedule 1 (Mine Rehabilitation Code), Part 3 (sections 28-34).

⁸⁴ *Mine Development and Closure Under Part VII of the Act*, O. Reg. 240/00, Schedule 1 (Mine Rehabilitation Code), Part 8 (sections 60-67).

⁸⁵ *Mines and Mining Plants*, R.R.O. 1990, Reg. 854, sections 18-19.

3. The state or province uses an ecosystem-based approach to mining regulation and employs comprehensive and integrated regulation and analysis of air, surface water, ground water and aquifer impacts, and considers all discharges synergistically to determine impacts on bioaccumulative chemicals of concern.

At the environmental assessment stage, there are significant barriers to employing an ecosystem approach. As detailed under the “Siting and Buffers” (Criterion 1, above), aspects of the mining project may come under federal or provincial environmental assessment processes. However, components of a mining operation are often exempted from environmental assessment or only considered in a piece-meal fashion. Only a federal-provincial Joint Review Panel will integrate the assessment of a project. Joint Review Panels are not the norm for environmental assessments.

Regarding approvals, there is a similar lack of integration needed to employ an ecosystem approach. There are no permits currently required from the Ministry of Northern Development and Mines for mining in Ontario. And, approvals for the water use and air emissions associated with mining are handled by different branches within the Ministry of the Environment.

Closure plans are subject to Ontario’s *Environmental Bill of Rights* (EBR). Section 11 of the EBR requires that the minister, when making decisions that might significantly affect the environment, take every reasonable step to ensure that the ministry statement of environmental values is considered.⁸⁶ The Ministry of Northern Development and Mines’s Statement of Environmental Values (unlike the Ministry of the Environment’s Statement of Environmental Values) does not contain a requirement that the precautionary approach be adopted. Two of the “environmental principles” that the Ministry of Northern Development and Mines commits to in the Statement of Environmental Values are that the Ministry: “Ensure continuing availability of mineral resources for the long-term benefit of the people of Ontario” and “Recognizes mining as a temporary land use, replaced in the long-term with alternative natural, recreational, or commercial land uses.”⁸⁷

With respect to review of closure plans, an official from the Ministry of Northern Development and Mines indicates that copies of the plans are posted on the Environmental Registry for public comment (as required under the EBR) and sent to various regulatory agencies including but not limited to the Ministry of the Environment, Ministry of Natural Resources, Ministry of Labour, Department of Fisheries and Oceans, as well as municipalities and potentially affected aboriginal communities for comment.⁸⁸

4. Regulations are applicable statewide or province-wide.

⁸⁶ *Environmental Bill of Rights, 1993*, S.O. 1993, c. 28, section 11.

⁸⁷ Ministry of Northern Development and Mines. Statement of Environmental Values. <http://www.ebr.gov.on.ca/ERS-WEB-External/content/sev.jsp?pageName=sevList&subPageName=10004>.

⁸⁸ Personal communication with Laura Blondeau, Communications Director, Office of the Minister of Northern Development, Mines and Forestry (e-mail dated November 10, 2011).

The *Mining Act* recognizes (or will recognize when the provisions are proclaimed to be in force, in the case of ss. 204 and 205) a difference among mining rights in the Far North, Northern Ontario, and Southern Ontario, and different considerations may apply in different areas.⁸⁹

5. The state or province regulates exploration to ensure protective capping and site remediation, and a thorough review process determines whether exploration is permitted based on the location's appropriateness for future mining.

A closure plan is required for advanced exploration under the *Mining Act* pursuant to section 140(3). The Code requires that a closure plan deal with protective capping and site remediation.⁹⁰ On a day to be proclaimed, the current *Mining Act* section 78 is to be repealed and replaced with a number of provisions, including section 78.2 (which requires the submission of an exploration plan before exploration can occur) and section 78.3 (which requires an exploration permit to be obtained before exploration can occur). Although regulations prescribing the activities to which each section will apply have not been made (expected to be introduced in April 2012), section 78.2 is to apply to activities that will have lower impacts on the land, while s. 78.3 is to apply to activities with more serious impacts.⁹¹

6. The state or province has an adequate monitoring program that allows for proactive, protective measures to be taken prior to any release or accident.

Various monitoring requirements are required components of closure plans; the proponent is responsible for implementing these programs.⁹² For example, see item 10 of Schedule 2 of O. Reg. 240/00, which requires a closure plan to include details of monitoring for physical stability; chemical stability of waste rock, tailings, effluents, etc.; and biological monitoring.

The Mine Rehabilitation Code prescribes a variety of monitoring programs, including:

- compliance with the Provincial Water Quality Objectives (PWQOs), although a mixing zone may be used where the proponent establishes it is not practicable to meet the PWQOs⁹³
- monitoring program demonstrating that contaminant concentrations in water draining from the site do not exceed the more stringent of the concentration limits in existing Certificate of Approval or effluent limits prescribed under O. Reg. 560/94⁹⁴

⁸⁹ *Mining Act*, R.S.O. 1990, c. M.14, sections 35.1, 204, 205.

⁹⁰ *Mine Development and Closure Under Part VII of the Act*, O. Reg. 240/00, s. 11, Schedule 1 (Mine Rehabilitation Code).

⁹¹ *Mining Act*, R.S.O. 1990, c. M.14, sections 78.2, 78.3.

⁹² *Mine Development and Closure Under Part VII of the Act*, O. Reg. 240/00, section 11, Schedule 2 (Contents of Closure Plan).

⁹³ *Mine Development and Closure Under Part VII of the Act*, O. Reg. 240/00, Schedule 1, Part 5 – Surface Water Monitoring.

- groundwater monitoring⁹⁵
- physical stability monitoring⁹⁶

In addition, the Mine Rehabilitation Code contains provisions for ongoing inspections post-closure⁹⁷ and for leaching and acid drainage sampling (and if necessary, a management plan).⁹⁸

Ontario has established sampling procedures and provides for the establishment of sampling points. Sampling procedure is to comply with “Protocol for the Sampling and Analysis of Industrial/Municipal Wastewater” published by the Ministry of the Environment.⁹⁹ Sampling points are to be used for all samples required under the Metal Mining Sector regulation, except pH monitoring as provided for in section 25. The Metal Mining Sector regulation applies only to metal mining plants that discharge a total volume of more than 50 m³ of process effluent, cooling water effluent, and overflow effluent. Monitoring requirements are set out in Part V of the Metal Mining Sector regulation, including procedures, frequency, etc. for process effluent, cooling water effluent, overflow effluent, and acute lethality testing.¹⁰⁰ Some exceptions are provided in section 20 to the general monitoring requirements.

Federally, the owner or operator of a mine must conduct environmental effects monitoring studies of the potential effects of effluent on the fish population, on fish tissue, and on the benthic invertebrate community.¹⁰¹ The monitoring must follow the procedure and occur with the frequency prescribed. These studies include effluent and water quality monitoring and biological monitoring. Procedures for deleterious substance and pH testing, with reference to Schedules 3 and 4, are set out and final discharge points must be sampled at least once weekly and at least 24 hours apart.¹⁰² There are also procedures for acute lethality testing.¹⁰³ These tests must be conducted at least once monthly on a date selected at least 30 days prior to sampling. Samples must be collected at least 15 days apart.

Where a deposit occurs outside the normal course of events, a sample from the location of the deposit must occur without delay unless an inspector is notified that the deposit is an acutely lethal effluent. Where a sample is acutely lethal, sampling from that point increases to twice monthly; if those samples are lethal sampling occurs weekly until three consecutive tests

⁹⁴ *Mine Development and Closure Under Part VII of the Act*, O. Reg. 240/00, Schedule 1, Part 5 – Surface Water Monitoring, section 39.

⁹⁵ *Mine Development and Closure Under Part VII of the Act*, O. Reg. 240/00, Schedule 1, Part 6 – Ground Water Monitoring.

⁹⁶ *Mine Development and Closure Under Part VII of the Act*, O. Reg. 240/00, Schedule 1, Part 6 – Physical Stability Monitoring.

⁹⁷ *Mine Development and Closure Under Part VII of the Act*, O. Reg. 240/00, Schedule 1, Part 1 – Protection of Mine Openings to Surface and Part 9 – Revegetation.

⁹⁸ *Mine Development and Closure Under Part VII of the Act*, O. Reg. 240/00, Schedule 1, Part 7 – Metal Leaching and Acid Rock Drainage Requirements.

⁹⁹ *Effluent Monitoring and Effluent Limits – Metal Mining Sector*, O. Reg. 560/94, sections 3, 7, 8.

¹⁰⁰ *Effluent Monitoring and Effluent Limits – Metal Mining Sector*, O. Reg. 560/94, Part V – Monitoring.

¹⁰¹ *Metal Mining Effluent Regulations*, SOR/2002-222, s. 7, Schedule 5.

¹⁰² *Metal Mining Effluent Regulations*, SOR/2002-222, section 12.

¹⁰³ *Metal Mining Effluent Regulations*, SOR/2002-222, sections 14-16.

come back as not acutely lethal. If effluent is not acutely lethal over 12 consecutive months, testing may decrease to once per calendar quarter. Procedure is set out for *Daphnia magna* monitoring tests.¹⁰⁴ If monitoring shows that the limits in Schedule 4 are exceeded, the pH of effluent is less than 6.0 or greater than 9.5, or the effluent is acutely lethal, the owner or operator of the mine must notify an inspector without delay.¹⁰⁵

7. The state or province requires mining and cleanup operations to comply with all applicable state, federal and tribal regulations.

The Ministry of Northern Development and Mines does not issue a permit for mining in Ontario. The potential to cancel or revoke mining rights in Ontario is only subject to noncompliance with the *Mining Act*. There is no mechanism that would trigger a review of a mining operation as a result of noncompliance with permits or approvals issued by other ministries (either provincially or federally).

Because the “acknowledgement of receipt of closure plan” is an instrument under the *Environmental Bill of Rights*, any two residents of Ontario could request a review of the instrument (including that there should be a review for noncompliance with approvals in other ministries).¹⁰⁶ However, the decision whether or not to review an instrument is highly discretionary and not subject to judicial review by the courts.¹⁰⁷

8. The state or province requires adequate up-front financial assurance to cover costs for worst-case scenario failures, contingency plan implementation.

Financial assurance is required as a component of a closure plan, which must be submitted prior to the commencement of advanced exploration or mining operations.¹⁰⁸ Various forms of financial assurance are acceptable to the Director of the Ministry of Northern Development and Mines including cash, a letter of credit, or compliance with a prescribed corporate financial test, among others. The proponent, if choosing a corporate financial test as assurance, must identify in the closure plan an alternative means of assurance if they cease to meet the corporate financial test, and must provide this to the Director within 30 days of ceasing to meet the test. If the proponent chooses a corporate financial test and wishes to place a project into temporary suspension, it must pay ¼ of the assurance immediately, and a further ¼ of the assurance for each of the next three years on the date on which the project was placed into suspension. Schedule 2 requires that details of the costs of implementing rehabilitation measures

¹⁰⁴ *Metal Mining Effluent Regulations*, SOR/2002-222, section 17.

¹⁰⁵ *Metal Mining Effluent Regulations*, SOR/2002-222, section 24.

¹⁰⁶ *Environmental Bill of Rights, 1993*, S.O. 1993, c.28, Part IV and *Classification of Proposals for Instruments*, O.Reg 618/94, section 12.

¹⁰⁷ *Environmental Bill of Rights, 1993*, S.O. 1993, c.28, sections 67, 68, 118.

¹⁰⁸ *Mining Act*, R.S.O. 1990, c. M.14, section 145 and *Mine Development and Closure Under Part VII of the Act*, O. Reg. 240/00, sections 13-20, Schedule 2.

be included in the closure plan; it appears as though the proponent is responsible for setting the level of required financial assurance.

Federally, the owner or operator of the mine must submit an irrevocable letter of credit to cover the implementation costs of the tailings impoundment area compensation plan.¹⁰⁹ This letter of credit is payable upon demand on the declining balance of the implementation costs. The amount of this assurance is based on the owner's/operator's own estimate of the cost of implementing the plan, although this estimate (as part of the plan) must be approved by the Minister of the Department of Fisheries and Oceans.

9. Financial assurance requirements reach beyond the term of the mining and waste management permits to encompass long-term water treatment needs, etc.

The Director of the Ministry of Northern Development and Mines can order that the performance of a requirement in a closure plan be paid for out of the financial assurance.¹¹⁰ Financial assurance by way of the corporate financial test does not extend beyond the productive life of the mine.¹¹¹

10. A comprehensive web of effective, interactive regulations protect surface water, ground water, air, land, wildlife habitat, wetlands, endangered species and assess impacts on global warming; mining operations are not exempted.

There are a number of legal and policy protections for ecosystems, which do apply to mining operations. It is not clear how the various legislative mandates (scattered across provincial and federal ministries) are coordinated. See also Criterion 3 (above).

11. An environmental review process that uses ecological values and carrying capacity is required and is applied by the state to determine where mining will be allowed.

To the extent that environmental assessment is required for mining activities (see Criterion 3 above), the federal standard is “no significant adverse environmental effects that cannot be mitigated.” Provincially, the standard is “betterment of the people” of Ontario “by providing for the protection, conservation and wise management” of the environment.¹¹² However, in practice the process assesses potential significant environmental impacts and proposed mitigation.

12. Numeric standards or determination processes for setting numeric standards are consistently applied to all discharges in every media (water, air, etc.); standards apply to all contaminants from all media and there are standards specifically applicable to sulfide mining contaminants (sulfides, heavy metals, chlorine, etc.).

¹⁰⁹ *Metal Mining Effluent Regulations*, SOR/2002-222, subsection 27.1(4).

¹¹⁰ *Mining Act*, R.S.O. 1990, c. M.14, subsection 145(6).

¹¹¹ *Mine Development and Closure Under Part VII of the Act*, O. Reg. 240/00, sections 16, 17.

¹¹² *Environmental Assessment Act*, R.S.O. 1990, c. E.18, section 2.

With respect to water, Ontario has set daily concentration limits and monthly average concentration limits for process effluents.¹¹³ Monitored contaminants include total cyanide, total suspended solids, copper, lead, nickel, zinc, and arsenic.¹¹⁴ The Ontario regulation sets out parameter limits (in numerical range) for pH value of effluent samples and prescribes a maximum of 50% mortality for acute lethality testing in 100% effluent.¹¹⁵ Federally, there are authorized limits of deleterious substances, including maximum authorized monthly mean concentration, maximum authorized concentration in a composite sample, and maximum authorized concentration in a grab sample.¹¹⁶ Regulated contaminants include arsenic, copper, cyanide, lead, nickel, zinc, total suspended solids, and radium-226.

13. The state or province requires holistic mine plans, including factors like: stability, workers' safety, long-term viability of the mine (not allowing just high-grading), economic plans for communities' long-term health, reasonable royalties, past performance of applicant and community priorities as expressed in Master Plans, zoning, etc.

The owner of a surface mine producing metallic ore, or the owner of an underground mine, must prepare and maintain a mine design assessing ground stability of active and proposed workings of the mine.¹¹⁷ This design is to be assessed and updated at least annually and before any alteration is made that may significantly affect ground stability of the mine. Safety information must be provided to an inspector before a closed mine is reopened.¹¹⁸ The *Occupational Health and Safety Act* operates to protect workers' safety generally. There are also a number of specific requirements pertaining to the safety of workers in the mines.¹¹⁹ Further, the Mine Rehabilitation Code contains a number of provisions relevant to the physical stability of mines, although many of these relate to post-closure stability.¹²⁰

Communities determine land use priorities under the authority of the *Planning Act*.¹²¹ Ontario guides land use planning by requiring that decisions made under the *Planning Act* are consistent with provincial policies.¹²² The current Provincial Policy Statement contains specific policies related to minerals and petroleum.¹²³ Section 2.4.1 states that minerals shall be protected for long term use.

¹¹³ *Effluent Monitoring and Effluent Limits – Metal Mining Sector*, O. Reg. 560/94, section 18 and Schedule 1.

¹¹⁴ *Effluent Monitoring and Effluent Limits – Metal Mining Sector*, O. Reg. 560/94, Schedule 1.

¹¹⁵ *Effluent Monitoring and Effluent Limits – Metal Mining Sector*, O. Reg. 560/94, sections 18, 19.

¹¹⁶ *Metal Mining Effluent Regulations*, SOR/2002-222, Schedule 4.

¹¹⁷ *Mines and Mining Plants*, R.R.O. 1990, Reg. 854, section 6.

¹¹⁸ *Mines and Mining Plants*, R.R.O. 1990, Reg. 854, section 23.

¹¹⁹ *Mines and Mining Plants*, R.R.O. 1990, Reg. 854.

¹²⁰ *Mine Development and Closure Under Part VII of the Act*, O. Reg. 240/00, Schedules 1, 2.

¹²¹ R.S.O. 1990, c. P.13.

¹²² *Planning Act*, R.S.O. 1990, c. P.13, subsection 3(5).

¹²³ Ministry of Municipal Affairs and Housing. (2005). Provincial Policy Statement. Toronto: Queen's Printer for Ontario. Available on-line: <http://www.mah.gov.on.ca/Page1485.aspx>

Section 2.4.2.1 states that minerals are to be protected from development and activities that would hinder their expansion or continued use or which would be incompatible for reasons of public health, public safety, or environmental impact. In addition, where lands have significant mineral potential, non-mining activities in and around those lands are prohibited unless resource use would not be feasible, proposed land use serves a greater long-term public interest, and issues of public health and safety and environmental impact are addressed. Section 2.4.3.1 requires rehabilitation to accommodate subsequent land uses once extraction and related activities have ceased, and states that progressive rehabilitation should be undertaken whenever feasible. In addition, extraction of minerals is permitted in prime agricultural areas as long as the area is subsequently rehabilitated. With mineral development being a prioritized land use, local community plans would only prevail if an alternative land use could meet the all the requirements in section 2.4.2.1 (as noted above).

Mining fees, taxes, rents, and royalties can be determined by Ontario under the authority of the *Mining Act*¹²⁴ and the *Mining Tax Act*¹²⁵. The Minister of Northern Development, Mines and Forestry sets the fees by regulation. Although royalties in Ontario are comparable to other jurisdictions, there are also mining incentives and tax exemptions that reduce the amount collected from mining companies. In 2005, the Auditor General for Ontario audited the Mines and Minerals Program:

We reviewed the Ministry's revenue collection efforts and found that royalties and mining fees were collected as required, and there were no appreciable outstanding debts.

However, we noted a number of concerns related to the invoicing and collection of taxes and rents for patented, leased, and licensed mining lands.¹²⁶

14. Mining sites must be returned to a functioning ecosystem that does not require perpetual care post-mining.

A proponent is required to undertake progressive rehabilitation on the mine site, unless the Director specifies otherwise. Progressive rehabilitation requires a site to be rehabilitated to its former use or condition.¹²⁷ All on-site watercourses, upon closing out of the mine, must be left so as not to require maintenance and shall be consistent with future use of land.¹²⁸ A proponent must restore the site to its former use or condition or an alternate use or condition that the Director sees fit.¹²⁹ Section 40 of the Mine Rehabilitation Code provides that a closure plan

¹²⁴ *Mining Act*, R.S.O. 1990, c. M.14, section 102.

¹²⁵ R.S.O. 1990, c. M.15.

¹²⁶ Auditor General of Ontario, Annual Report, 2005, page 200.

http://www.auditor.on.ca/en/reports_en/en05/309en05.pdf

¹²⁷ *Mining Act*, R.S.O. 1990, c. M.14, sections 139, 139.1.

¹²⁸ *Mine Development and Closure Under Part VII of the Act*, O. Reg. 240/00, subsection 24(2)(18).

¹²⁹ *Mine Development and Closure Under Part VII of the Act*, O. Reg. 240/00, subsection 24(3).

must include steps to re-establish a diverse and viable aquatic community if this has been adversely affected during the mine's operation or closure.¹³⁰ And Part 9 of the Mine Rehabilitation Code provides for the revegetation of the closed mine site.

15. The state or province requires that all impacts, on and off site, be analyzed, assessed and included in permitting decisions.

As mentioned previously, there currently is no permit for mining in Ontario. The only requirement is the submission of a closure plan, which requires details regarding the current land use of immediately adjacent lands that may be affected by the project; waters flowing through and receiving flow from the site; and ground water and terrestrial and aquatic plant and animal life.¹³¹

16. The state or province requires a cumulative impacts analysis that includes impacts from any beneficiation or transportation of the facility's ore in the state or province.

As detailed under the "Siting and Buffers" (Criterion 1, above), aspects of the mining project may come under federal or provincial environmental assessment processes. However, components of a mining operation are often exempted from environmental assessment or only considered in a piece-meal fashion. Cumulative impacts analysis is required federally, but that would only apply to the assessment of the aspects of the project that fall under federal jurisdiction.

17. The state or province requires contingency plans for any potential failures.

Ontario does not require contingency plans for mining operations. Under the authority of the *Fisheries Act*, the owner or operator of a mine must prepare an emergency response plan that describes the measures to be taken in respect of a deleterious substance to prevent a deposit out of the normal course of events or to mitigate the effects of such a deposit.¹³²

¹³⁰ *Mine Development and Closure Under Part VII of the Act*, O. Reg. 240/00, Schedule 1.

¹³¹ *Mine Development and Closure Under Part VII of the Act*, O. Reg. 240/00, Schedule 2.

¹³² *Metal Mining Effluent Regulations*, SOR/2002-222, section 30.

2. REVIEW PROCESS

Since each jurisdiction surveyed prohibits mining or related activities without a state-issued permit, with the sole exception of Ontario, the process of reviewing an application for a mining permit is a critical part of the states' regulatory scheme. The application stage is a jurisdiction's best opportunity to control a sulfide mine by setting the parameters of the operation's location, technologies, monitoring requirements, and so on, or by denying an application that fails to meet the state's safety requirements. An ideal application review process is highly detailed, independent, and public. There are a number of factors the jurisdiction can require of a proposed mine that will decrease the likelihood of environmental damage and ensure that the mine operator/owner is providing a net positive value to the jurisdiction. The jurisdiction should apply clear standards to each application, and should have the resources (financial and expert) to conduct a thorough and competent review. It is also important that the application review process be open to the public and that special care be taken to respond meaningfully to the concerns of any local governments or tribes whose interests are directly affected by the proposed mine. These standards and expectations are set forth in the following criteria:

1. The state or province requires applicants and permittees to submit supporting data sufficient to provide for meaningful and substantive review of the application or request.
2. The state or province is supportive of and cooperative with other applicable regulatory regimes including federal and tribal governments.
3. The state or province has an integrated process for assessing applications and integrating input. The process should include cross-disciplinary review and input from fellow agencies that is unhampered by political pressure.
4. The state facilitates and incorporates feedback from public participation in all aspects of environmental review, application assessment, permitting and enforcement.
5. Consent by any impacted tribe/First Nation is required for mine approval.
6. Standards and criteria are concrete, clear and easily enforced. Self-realizing standards are best (like the WI "Prove it first" law).
7. Standards for reclamation and remediation are in place prior to mining; the applicant must demonstrate that they can be met prior to an application gaining approval.
8. Government-to-government consultation results in tribal requests being integrated into the permitting process and enforceable.
9. The state or province denies permits if they do not meet the regulatory standards.
10. All state or province analytical materials and data are available to the public.
11. The state or province requires that all data supporting an application be available to the public.
12. The state or province supplements applicant-provided data with its own, independently-gathered data.
13. Tribes/First Nations impacted by a mine proposal have delegated authority, if desired, for regulation and enforcement of environmental standards and adequate resources to pursue that authority.

14. The state or province ensures that regulators do not have financial conflicts of interest in making permit decisions.
15. Public funds may not be committed to financing or assisting project development until environmental review is completed.
16. Financial assurance is calculated transparently and well-before any permit is issued.
17. Financial assurance, including its amount and devices, is developed collaboratively with financial as well as environmental expertise.

A. MICHIGAN

Michigan’s regulations do not require a highly technical, detailed, or independent review of mining applications. To the extent that the law mandates a comprehensive analysis of the applicant’s submissions, the DEQ has been sharply criticized for falling short of that mandate in its review of the Kennecott Eagle project. Specifically, the state’s ability and willingness to cooperate with and integrate public concerns has been called into question.

Overall grade: Poor

1	The state or province requires applicants and permittees to submit supporting data sufficient to provide for meaningful and substantive review of the application or request.	NO
2	The state or province is supportive of and cooperative with other applicable regulatory regimes including federal and tribal governments.	NO
3	The state or province has an integrated process for assessing applications and integrating input. The process should include cross-disciplinary review and input from fellow agencies that is unhampered by political pressure.	SOME
4	The state facilitates and incorporates feedback from public participation in all aspects of environmental review, application assessment, permitting and enforcement.	NO
5	Consent by any impacted tribe/First Nation is required for mine approval.	NO
6	Standards and criteria are concrete, clear and easily enforced. Self-realizing standards are best (like the WI “Prove it first” law).	NO
7	Standards for reclamation and remediation are in place prior to mining; the applicant must demonstrate that they can be met prior to an application gaining approval.	YES
8	Government-to-government consultation results in tribal requests being integrated into the permitting process and enforceable.	NO
9	The state or province denies permits if they do not meet the regulatory standards.	NO
10	All state or province analytical materials and data are available to the public.	SOME
11	The state or province requires that all data supporting an application be available to the public.	YES
12	The state or province supplements applicant-provided data with its own, independently-gathered data.	SOME
13	Tribes/First Nations impacted by a mine proposal have delegated authority, if desired, for regulation and enforcement of environmental standards and adequate resources to pursue that authority.	NO
14	The state or province ensures that regulators do not have financial conflicts of interest in making permit decisions.	SOME
15	Public funds may not be committed to financing or assisting project development until environmental review is completed.	NO
16	Financial assurance is calculated transparently and well-before any permit is issued.	YES
17	Financial assurance, including its amount and devices, is developed collaboratively with financial as well as environmental expertise.	NO

Discussion:

1. The state or province requires applicants and permittees to submit supporting data sufficient to provide for meaningful and substantive review of the application or request.

The application for a mining permit must include materials describing the potential impacts, mine design and plan of operation and reclamation. MCL §324.63205(2)(b)-(f). These materials, however, are described quite generally and lack technical requirements and minimum standards (as are found, for example, in Minnesota's and Wisconsin's laws). Further, the statute places on the applicant the "burden of establishing" that the proposed plan will "reasonably minimize" environmental impacts. MCL §324.63205(3). This is a highly subjective and broadly written standard, and gives no guidance on what may or may not be "reasonable" or "minimized."

In practice, there is reason to doubt whether DEQ is actually requiring sufficient data from applicants. In reviewing the Kennecott Eagle project application, DEQ staff reports that it did request and require additional information, including a supplemental EIS from the applicant in order to have sufficient data to evaluate the application. Challengers to the application, on the other hand, have reported and alleged that DEQ has not required sufficient data and the application from Kennecott does not fulfill the statutory directive cited above. This statute could be improved by being made more specific. For example, instead of requiring simply a "description of the materials, methods and techniques that will be used," the state could specify all the aspects of the operation it was interested in, as is done in Wisconsin's regulation (NR 132.07). This would take the discretion away from the DEQ and clarify for all concerned exactly what is required.

2. The state or province is supportive of and cooperative with other applicable regulatory regimes including federal and tribal governments.

There is little to no meaningful cooperation with tribes, and coordination with federal authorities is ad hoc.¹³³

Tribal government coordination: If a proposed operation is located on a reservation, the tribe will have primary jurisdiction, but if on ceded territory, tribes will in theory be "consulted" on a proposal – a one-on-one meeting to hear any tribal concerns. The law requires notification to tribes at each step in the permitting process in the same way as notification is given to local units of government. For example, R 425.201(4)(c) requires the state to give notice of a permit application "to all affected federally recognized Indian tribes in this state."

In practice, however, the state has so far not adequately managed tribal concerns in sulfide mine permitting. For example, the Keweenaw Bay Indian Community (KBIC) has vehemently opposed the Eagle mine project, because the proposed operations will cut off access to tribal hunting and fishing areas and destroy a site sacred to the Ojibwa people, the Eagle Rock. Under the current plan, Eagle Rock will literally be demolished at least in part by the operation. KBIC's opposition and litigation to stop the mine have so far proven unsuccessful. Another tribal group, the Ho Chunk nation, petitioned the federal EPA in late 2011 to stop the project, also

¹³³ The Copperwood Mine has applied for at least two federal permits; MDEQ issued its draft approval and permit conditions prior to any federal decisions being made.

based on the sacred nature of Eagle Rock.¹³⁴ The Ho Chunk nation was never consulted by a regulatory body regarding the project application.

Federal: Some issues are under direct federal authority (e.g. underground injection) while in other areas the state exercises delegated authority (e.g. point source discharge permitting under CWA). The type of coordination depends on what issue is at stake. Generally, there are no formal mechanisms for coordination, but it is ad hoc and as-needed. The rules require applicants to list all other state and federal permits that will be required by the proposed operation, and DEQ's internal guidance suggests that applicants must also have obtained such permits before the mining permit will be effective.¹³⁵

3. The state or province has an integrated process for assessing applications and integrating input. The process should include cross-disciplinary review and input from fellow agencies that is unhampered by political pressure.

The mining team set up to evaluate the application will include personnel from whatever agencies are needed, based on expertise.¹³⁶ This process is not set by statute, but is at least formalized in a highly detailed internal DEQ guidance document, so the process should be systematic among all applications. Whether or not this process is influenced by political pressure cannot be judged without more experience in dealing with applications.

4. The state facilitates and incorporates feedback from public participation in all aspects of environmental review, application assessment, permitting and enforcement.

The main avenue for public participation is during application assessment and permitting. During the enforcement stage, the public can make a complaint and DEQ must make a record of the allegation, investigate and within 15 days of completing its investigation provide a written report to the permittee and the person making the complaint. There is no official procedure for public involvement in monitoring activities, though nothing precludes it, except potentially the objection of the landowner. Official complaints from the public would result in an investigation and field report, which would be a matter of public record.

Beyond these official procedures and allowances, DEQ's relationship with concerned citizens, environmental groups, and Tribal leaders in review of the proposed Eagle project has been extremely contentious, resulting in complex ongoing litigation opposing DEQ's approval of the mine application. In the summer of 2011, environmental groups directly petitioned the state Attorney General to seek enforcement actions against alleged DEQ incompetence and fraud, based on the argument that DEQ had "willfully ignored" evidence put forth by the opposition and failed to enforce the law as written in reviewing the permit application.¹³⁷ The legal requirements for public participation may be as strong as other jurisdictions, but in this case, the state has failed to meet the public and public interest groups' questions and concerns.

5. Consent by any impacted Tribe/First Nation is required for mine approval.

Consent by impacted tribes is not required for approval.

¹³⁴ Full text of this letter is available online at <http://takingastandfortheland.files.wordpress.com/2011/09/ho-chunk-letter-re-eagle-rock.doc>. Accessed December 28, 2011.

¹³⁵ See DEQ guidance document, *supra* note 23, at 2.

¹³⁶ *Id.*

¹³⁷ Full text of this letter is available online at <http://standfortheland.com/2011/08/01/environmental-groups-ask-michigan-a-g-to-investigate-allegations-of-fraud-at-deq/#more-1357>. Accessed December 22, 2011.

6. Standards and criteria are concrete, clear and easily enforced. Self-realizing standards are best (like the WI “Prove it first” law).

The standards for application review are not as clear as they could be. The state requires specific information from an applicant (MCL § 324.63205(2)), but the only “standards” that an applicant must really meet are that its project will not “pollute, impair, or destroy the air, water, or other natural resources or the public trust in those resources” (MCL § 324.63205(11)) and that “the terms and conditions set forth in the permit application; mining, reclamation, and environmental protection plan; and environmental impact assessment will result in a mining operation that reasonably minimizes actual or potential adverse impacts on air, water, and other natural resources and meets the requirements of this act.” MCL § 324.63205(2)(c). Of course, these standards could be interpreted in many ways and include the highly subjective “reasonably minimizes” language. The DEQ must deny a permit to any applicant who fails to meet “any part” of the Act, but without specific and clear standards required in the application itself, this fails to set a clear bar. MCL § 324.63205(10).

7. Standards for reclamation and remediation are in place prior to mining; the applicant must demonstrate that they can be met prior to an application gaining approval.

Yes, standards for reclamation and remediation must be approved as part of the permit application. MCL §324.63205(2)(c)(3). Also, the applicant must demonstrate that the methods proposed for both mining operations and reclamation goals are feasible to achieve the desired/stated goal.

8. Government-to-government consultation results in tribal requests being integrated into the permitting process and enforceable.

While tribes must officially be provided notice, considered and consulted, they have little if any actual authority in the process. The tribes are consulted and are notified of changes that might affect their interests, but their requests are not automatically incorporated. Officially, they have no greater legal standing than any local unit of government or concerned citizen. As discussed above, in the Kennecott project, tribal concerns regarding access to treaty rights on ceded lands (hunting and fishing rights) and the demolition of Eagle Rock were not addressed to the tribes’ satisfaction, leading them to sue (unsuccessfully thus far) to stop the project.

9. The state or province denies permits if they do not meet the regulatory standards.

The statute requires denial for failure to meet any requirement, MCL §324.63205(10), but this has not happened (yet) in practice. Many environmental groups and other citizen opponents of the Kennecott project have cited numerous areas where DEQ allegedly did not meet the regulatory standards for permit review, and allowed the developer to begin construction without having the required permits in hand. While the law requires denial of permit applications for failure to meet regulatory standards it is at least suspected that the agencies have not followed this to the letter. This is the very subject of the on-going litigation challenging the permitting of the Eagle Mine.

10. All state or province analytical materials and data are available to the public.

All analytical materials and data produced by DEQ is public, though technical data would not be automatically posted but would have to be requested. The DEQ’s Freedom of Information

Act procedures have improved in the past years after state reports critical of the Eagle Mine were deleted from computers and not made publicly available upon request.

11. The state or province requires that all data supporting an application be available to the public.

All data supporting an application is automatically posted on the department's website and disseminated to affected communities in informational meetings and print sources. The DEQ maintains a website for each project, but currently only includes Part 632 materials on the site; this is indicative of the bifurcated review process.

12. The state or province supplements applicant-provided data with its own, independently-gathered data.

The state relies primarily on data supplied by the applicant, but also collects its own air and water quality data and visits the site to confirm the applicant's data assertions. The frequency and comprehensiveness of the state's data collection could be greatly improved.

13. Tribes/First Nations impacted by a mine proposal have delegated authority, if desired, for regulation and enforcement of environmental standards and adequate resources to pursue that authority.

Tribes have no delegated authority pursuant to §632 or its implementing regulations. Tribes are recognized only to the same extent as local units of government, i.e. they are to be notified of public meetings on new permits, and are to receive a copy of the permittee's annual report to the state. Tribes have federally-granted authority in water quality regulation only where tribe has "treatment-as-state" status.¹³⁸

14. The state or province ensures that regulators do not have financial conflicts of interest in making permit decisions.

This is not regulated specifically within the sulfide mining program, but is regulated through general state ethics laws. The Eagle Mine has cast doubt on the efficacy of the state's programs due to several employees transitioning directly from state employment (Governor's office and a reviewer of Kennecott's permit application) to employment by Kennecott, with no transparency about their intentions even when testifying on Kennecott's behalf just months before their change in employment.

15. Public funds may not be committed to financing or assisting project development until environmental review is completed.

Nothing in the Michigan Environmental Protection Act or Part 632 and its regulations prohibits the state from financing or entering into agreements with projects undergoing environmental review.

16. Financial assurance is calculated transparently and well-before any permit is issued.

¹³⁸ Since the Clean Water Act is a federal law applying equally to all states, "treatment as state" status is equally available in all states. See Water Quality Report, Appendix A.

The state hires an outside consultant to do the calculations and all data and calculations are available for public review. Financial assurance is a prerequisite for the permit to be issued; it is a required part of the permit application. MCL 324.63205(2)(e).

17. Financial assurance, including its amount and devices, is developed collaboratively with financial as well as environmental expertise.

Financial assurance is based on an environmental analysis done primarily by the applicant, while the financial calculation itself is done by the state’s consultant.

B. MINNESOTA

Minnesota’s permit review process is highly detailed insofar as the submission requirements, but fails to set out a clear standard or set of standards for decision-making. Public participation is highly regulated but not meaningfully encouraged past the environmental review phase. Tribal interests are consulted to a greater extent than in other jurisdictions, but no official regulatory authority is given to tribal governments.

Overall Grade: Fair.

1	The state or province requires applicants and permittees to submit supporting data sufficient to provide for meaningful and substantive review of the application or request.	YES
2	The state or province is supportive of and cooperative with other applicable regulatory regimes including federal and tribal governments.	YES
3	The state or province has an integrated process for assessing applications and integrating input. The process should include cross-disciplinary review and input from fellow agencies that is unhampered by political pressure.	SOME
4	The state facilitates and incorporates feedback from public participation in all aspects of environmental review, application assessment, permitting and enforcement.	SOME
5	Consent by any impacted tribe/First Nation is required for mine approval.	NO
6	Standards and criteria are concrete, clear and easily enforced. Self-realizing standards are best (like the WI “Prove it first” law).	NO
7	Standards for reclamation and remediation are in place prior to mining; the applicant must demonstrate that they can be met prior to an application gaining approval.	YES
8	Government-to-government consultation results in tribal requests being integrated into the permitting process and enforceable.	NO
9	The state or province denies permits if they do not meet the regulatory standards.	N/A
10	All state or province analytical materials and data are available to the public.	YES
11	The state or province requires that all data supporting an application be available to the public.	YES
12	The state or province supplements applicant-provided data with its own, independently-gathered data.	SOME

13	Tribes/First Nations impacted by a mine proposal have delegated authority, if desired, for regulation and enforcement of environmental standards and adequate resources to pursue that authority.	NO
14	The state or province ensures that regulators do not have financial conflicts of interest in making permit decisions.	YES
15	Public funds may not be committed to financing or assisting project development until environmental review is completed.	SOME
16	Financial assurance is calculated transparently and well-before any permit is issued.	YES
17	Financial assurance, including its amount and devices, is developed collaboratively with financial as well as environmental expertise.	N/A

Discussion:

1. The state or province requires applicants and permittees to submit supporting data sufficient to provide for meaningful and substantive review of the application or request.

The application for a mining permit must include an extremely lengthy list of technical documentation, maps, and other assessment data, too lengthy to quote here. See Rule 6132.1100, subpt 3. These regulations are similar in scope and detail to Wisconsin's, stating specifically not just the type of information that must be submitted but the technical format of such information and parameters for measuring and setting forth the information.

2. The state or province is supportive of and cooperative with other applicable regulatory regimes including federal and tribal governments.

The state has a well-developed though somewhat informal relationship with tribal authorities, and so far has given them a good opportunity to participate as reviewing agencies with the Polymet mine application. Federal coordination is ad hoc but so far cooperative.

Much of northern Minnesota is ceded territory (ceded by tribes in 19th Century treaties) and now public land, where the tribes retain usufructory rights to hunt, fish and gather. Thus, when public lands are involved, the tribes will have special say in the permitting and management of a sulfide mine. This has been the case in the Polymet project. Polymet's mine and site locations are in ceded territory under an 1854 treaty with the Bois Forte Band of Chippewa, Fond du Lac Band of Lake Superior Chippewa, and Grand Portage Band of Chippewa. The Bois Forte Band and Fond du Lac Band are participating as cooperating agencies in the Polymet review and their viewpoint is interjected in numerous places throughout the draft EIS. A memorandum of understanding (last amended in May 2008) defines the roles and responsibilities of these parties. The Grand Portage Band is not currently a cooperating agency or signatory to the memorandum of understanding, but it was not involved in the DEIS preparation process and recently requested formal confirmation of cooperating agency status for the project.¹³⁹

Also, over the years, DNR has initiated quarterly update meetings on issues affecting tribes, and tribes are given an extra notice on mining permit applications. Their interests are

¹³⁹ The complete Draft EIS is available on DNR's website at http://files.dnr.state.mn.us/input/environmentalreview/polymet/draft_eis/summary_document.pdf. Accessed December 13, 2011.

more important than those of local units of government, in that they are consulted in a way that gives them more authority than local governments.

3. The state or province has an integrated process for assessing applications and integrating input. The process should include cross-disciplinary review and input from fellow agencies that is unhampered by political pressure.

Coordination among agencies is informal and not officially mandated. The EIS is produced in a joint effort between all potentially involved agencies, but after that the agencies coordinate efforts only on an ad-hoc basis. There is no common permit, or superior permit or regulator among them. Public input must be systematically included in the EIS process. The extent of political influence is unknown.

4. The state facilitates and incorporates feedback from public participation in all aspects of environmental review, application assessment, permitting and enforcement.

Minnesota sets very detailed standards for public input, allowing for a great deal of involvement through the EIS phase, but limiting involvement in permit review and enforcement. In the EIS and scoping phase, any interested person may participate in the scoping process for the EIS (to determine the subjects, concerns, etc., addressed in the EIS), and may comment on the draft EIS. Those comments must be incorporated and addressed in the final EIS. R 4410.2100, 2600, 2700. Interested persons may also submit written comments on the adequacy of the final EIS for 10 days following its publication. R 4100.2800, subpt 2.

During the permit review process, there is a more limited scope for participation than Wisconsin or Michigan allow. The permit applicant must publish a notice of the application in a newspaper of local circulation in the affected area. R6132.4900. Objections to the proposal must include a statement of interest and/or evidence of a material issue of fact that should be brought out through a contested case hearing. Minn. Rules 6132.4900, subpt 2. The commissioner then decides whether the person has standing and/or a reasonable claim (or is an affected local government or agency) and if so, a contested case is held and that person may participate. Otherwise, the commissioner proceeds as if no objection was filed.

In the enforcement phase, public comment is not solicited, nor is there a formal mechanism for input. Informal complaints or comments are fielded by a program staff person, who then will put the person in touch with the responsible agency or the permittee, as needed. A citizen complaint will not automatically trigger a departmental investigation.

5. Consent by any impacted tribe/First Nation is required for mine approval.

Consent by impacted tribes is not required for approval.

6. Standards and criteria are concrete, clear and easily enforced. Self-realizing standards are best (like the WI “Prove it first” law).

Minnesota’s application standards are highly detailed and therefore allow for easier and more concrete decision-making. However, there is a lack of a clear decision-making standards based on those submissions. DNR must approve the permit only if the applicant has complied with the requirements, but this could be read to say merely that the application is complete and in the proper format.

7. Standards for reclamation and remediation are in place prior to mining; the applicant must demonstrate that they can be met prior to an application gaining approval.

A reclamation plan must be filed with the application for the permit to mine. R6132.1100, subpt 6. Before granting the permit, DNR must “determine that that the reclamation or restoration planned for the operation complies with lawful requirements and can be accomplished under available technology and that a proposed reclamation or restoration technique is practical and workable under available technology.” Minn. Stat. §93.481, subd 2.

8. Government-to-government consultation results in tribal requests being integrated into the permitting process and enforceable.

The tribes are consulted prior to application submission and are updated at least quarterly on any activities potentially affecting their interests or rights. Three tribes are participating agencies in the EIS review of the PolyMet project, and have submitted numerous comments and questions in the public record. The extent to which these comments and concerns will be addressed is as yet unknown, as no sulfide mine has come into operation and Polymet is still under review. However, there is no general indication in the law that tribal standards or requests must or even should be integrated.

9. The state or province denies permits if they do not meet the regulatory standards.

DNR is directed by statute that it may grant a permit only once it has determined that the proposed project meets all “lawful requirements”. Minn. Stat. §93.481, subd 2. However, there is no experience with this yet since only one permit has been sought under these rules and is currently still in the environmental review phase.

10. All state or province analytical materials and data are available to the public.

Everything is available, though it may not be automatically posted. If the applicant or operator requests confidentiality, it must be done through a specific statutory process.

11. The state or province requires that all data supporting an application be available to the public.

Yes, all application data is available.

12. The state or province supplements applicant-provided data with its own, independently-gathered data.

DNR does a site visit in the pre-application phase and helps the applicant set up the method of the mine characterization study, which becomes the basis for the reclamation plan. DNR also double-checks all the calculations made in the mine characterization study.

13. Tribes/First Nations impacted by a mine proposal have delegated authority, if desired, for regulation and enforcement of environmental standards and adequate resources to pursue that authority.

Tribes have no special significance or statutory/regulatory power in the regulation or monitoring of the mining operation, once running, unless the project is on their property. They can gain official regulatory authority only if they choose to be a “cooperating agency” in the EIS

(though this authority would evaporate following environmental review), and can gain federal “treatment as state” status and exercise authority in water quality regulation.¹⁴⁰

14. The state or province ensures that regulators do not have financial conflicts of interest in making permit decisions.

Minn. Stat. §43A.38 is the code of ethics for executive branch employees and includes a prohibition of financial conflicts of interest.

15. Public funds may not be committed to financing or assisting project development until environmental review is completed.

Public financing, approval, or permitting of a project cannot occur until the project’s environmental review is complete. The Minnesota Environmental Policy Act prohibits a “final governmental decision ... to grant a permit” until any environmental review is complete. Minn. Stat. §116D.04, sub 2(b); Minn R. 4410.3100, sub 1. Under the Rules, a “permit” means, *inter alia*, a “commitment to issue or the issuance of a discretionary contract, grant, subsidy, loan or other form of financial assistance, by a governmental unit.” Minn. R. 4410.0200, sub 58.

However, the state’s handling of the Polymet mine opened the door for investment/loans to sulfide mines by a state board, even while environmental review is pending. A number of governmental entities are exempt from the general rule prohibiting a commitment to financing or assisting: courts, school districts, and regional development commissions other than the Metropolitan Council. Minn. Stat. 116D.04, sub 1(a)(e). The 2011 Legislature added another entity to this exemption list, the Iron Range Resources and Rehabilitation Board (IRRRB). This was done just months after the IRRRB granted the Polymet project developer a \$4 million loan for property acquisition required for the project, and was sued by a number of environmental groups for violating MEPA. Once the IRRRB was added to the exemption list in summer 2011, the lawsuit was dropped for mootness and the loan was secured.

16. Financial assurance is calculated transparently and well-before any permit is issued.

Financial assurance must be in place before the mining permit is issued. R6132.1200, subpt 4(B). The department does the calculation but may hire a third party to evaluate the financial assurance (in which case, the permittee bears the cost of this third party review). Minn. Rules 6132.1200, subpt 4(A). It is available for public review, though the permittee could request confidentiality if it shows sufficient grounds.

17. Financial assurance, including its amount and devices, is developed collaboratively with financial as well as environmental expertise.

Since the EIS process is coordinated by state agencies (as opposed to the applicant), the environmental information and expertise of the state should be integrated into the financial assurance calculation. Whether this happens in practice remains to be seen, as Minnesota has no experience with such calculations as of yet.

C. WISCONSIN

Wisconsin’s application review process is very thorough and provides clear standards for both applicants and agency review. The “prove-it-first” standard places the impetus on the

¹⁴⁰ See Water Quality Report, Appendix A.

permittee to show that a sulfide mine can in fact operate without causing environmental damage, while the department retains responsibility to investigate and create the environmental assessment independently, instead of relying on an assessment prepared by the permittee. The process could be improved by better integration and giving more weight to tribal input, and by making cross-disciplinary coordination more systematic.

Overall grade: Fair

1	The state or province requires applicants and permittees to submit supporting data sufficient to provide for meaningful and substantive review of the application or request.	YES
2	The state or province is supportive of and cooperative with other applicable regulatory regimes including federal and tribal governments.	SOME
3	The state or province has an integrated process for assessing applications and integrating input. The process should include cross-disciplinary review and input from fellow agencies that is unhampered by political pressure.	SOME
4	The state facilitates and incorporates feedback from public participation in all aspects of environmental review, application assessment, permitting and enforcement.	SOME
5	Consent by any impacted tribe/First Nation is required for mine approval.	NO
6	Standards and criteria are concrete, clear and easily enforced. Self-realizing standards are best (like the WI “Prove it first” law).	YES
7	Standards for reclamation and remediation are in place prior to mining; the applicant must demonstrate that they can be met prior to an application gaining approval.	YES
8	Government-to-government consultation results in tribal requests being integrated into the permitting process and enforceable.	NO
9	The state or province denies permits if they do not meet the regulatory standards.	N/A
10	All state or province analytical materials and data are available to the public.	YES
11	The state or province requires that all data supporting an application be available to the public.	YES
12	The state or province supplements applicant-provided data with its own, independently-gathered data.	SOME
13	Tribes/First Nations impacted by a mine proposal have delegated authority, if desired, for regulation and enforcement of environmental standards and adequate resources to pursue that authority.	NO
14	The state or province ensures that regulators do not have financial conflicts of interest in making permit decisions.	YES
15	Public funds may not be committed to financing or assisting project development until environmental review is completed.	NO
16	Financial assurance is calculated transparently and well-before any permit is issued.	YES
17	Financial assurance, including its amount and devices, is developed collaboratively with financial as well as environmental expertise.	N/A

Discussion:

1. The state or province requires applicants and permittees to submit supporting data sufficient to provide for meaningful and substantive review of the application or request.

The application for a mining permit must include a mining plan, reclamation plan, and a host of other detailed data. NR 132.06(3). The requirements for both the mining plan (the key part of the application), Wis Stat. § 293.37(2)(a), and the reclamation plan are similarly detailed. NR 132.08. These regulations comprehensively establish what the department is interested in learning from an applicant and give the department additional leeway to seek any other information from the applicant it desires. NR 132.06(3)(k). These regulations go much farther and are far more specific than Michigan's regulations and requirements for a permit application.

2. The state or province is supportive of and cooperative with other applicable regulatory regimes including federal and tribal governments.

Wisconsin gives no official support to tribal governments, nor is it required to support any applicable tribal regulations or rules; federal agencies are consulted on an ad hoc basis.

Tribal government: Tribes are consulted basically the same way as local units of government; there is no separate formal way of dealing with tribes, or special consideration given to their opinions or regulation. Some tribes, however, may have "treatment as state" status for water quality management in a particular location, and in that case the tribe would have status equal to that of the state in enforcing water quality standards.

Federal: The state coordinates with federal agencies on an ad hoc basis. In the first Crandon project, a joint EIS was prepared with the Army Corps of Engineers (ACE), but on the Flambeau project, ACE had no authority and so did no EIS. DNR coordinates with the US Fish and Wildlife Service for endangered species management.

3. The state or province has an integrated process for assessing applications and integrating input. The process should include cross-disciplinary review and input from fellow agencies that is unhampered by political pressure.

The assessment of applications does not require official cross-disciplinary coordination, though this occurred in the review of the Crandon mine and the Flambeau project. Inter-agency coordination is an expected part of any large project review, but not formalized in any regulation, rule, or guidance document. The extent of political pressure is unknown.

4. The state facilitates and incorporates feedback from public participation in all aspects of environmental review, application assessment, permitting and enforcement.

Wisconsin has a well-developed system for integrating public participation in all phases of a project. In the application phase, the first opportunity for public participation comes with the mandatory public hearing on the Notice of Intent (which is submitted prior to any application). Then, the draft EIS is released, and another public hearing is held. The EIS is reviewed for adequacy and there is a mandatory contested case hearing on the EIS. The hearing examiner's decision can be appealed by anyone. Non-formal avenues for participation are also available through ongoing public meetings on the project or specific areas of concern. All DNR meetings with the potential permittee are reportedly open and can be recorded.

In the enforcement phase, public participation is not solicited but the public is kept informed via the departmental website. If a permit is modified, there must be public notice and may be a hearing. Formal complaints become public, but non-formal

questions/comments/complaints from the public do not become public record. The public may participate in enforcement activities, if the landowner agrees.

5. Consent by any impacted tribe/First Nation is required for mine approval.

Consent is not required for permit approval.

6. Standards and criteria are concrete, clear and easily enforced. Self-realizing standards are best (like the WI “Prove it first” law).

The “prove it first” test that requires the applicant to submit evidence of other sulfide mines that have not polluted and have been successfully reclaimed is a high bar, and should be easily enforced. The Crandon mine applicant proposed a set of mines that it thought met the bar, but withdrew the application before the state made a final assessment. In addition to the prove-it-first standard, Wisconsin’s application requirements are more than a mere list of descriptions and technical submissions. Rather, they include standards of care, design, and specific protective devices. Wis. Stat. § 293.37(2)(a). For example, the applicant must show that its design will not cause an exceedance of groundwater quality standards for the site.

7. Standards for reclamation and remediation are in place prior to mining; the applicant must demonstrate that they can be met prior to an application gaining approval.

The reclamation plan is part of the permit application, NR 132.06(3), and the application is reviewed for both operational and financial feasibility.¹⁴¹

8. Government-to-government consultation results in tribal requests being integrated into the permitting process and enforceable.

Tribes are considered coequal with any other affected person or party; they have no special power or authority in the permitting process. The law nowhere requires consultation or consideration of tribal requests.

9. The state or province denies permits if they do not meet the regulatory standards.

The statute requires denial for failure to meet requirements, but in practice, the department has not yet rejected any application.

10. All state or province analytical materials and data are available to the public.

Everything is available and would probably be posted online (though the state has no experience with this as yet). An applicant or operator can request confidentiality but only through a formal process.

11. The state or province requires that all data supporting an application be available to the public.

All data is available online as part of the application.

12. The state or province supplements applicant-provided data with its own, independently-gathered data.

Most of the data is gathered by the applicant but the state does some independent gathering (e.g., monitoring wells) and monitors and verifies the applicant’s sampling and data.

¹⁴¹ Larry Lynch, *supra* note 31.

The samples are generally analyzed by state-certified labs and the Notice of Intent sets out procedures and licenses for collection and analysis.

13. Tribes/First Nations impacted by a mine proposal have delegated authority, if desired, for regulation and enforcement of environmental standards and adequate resources to pursue that authority.

Tribes have no delegated authority from the state regarding sulfide mining operations. They may, however, exercise some authority where they have federally-granted “treatment as state” status.

14. The state or province ensures that regulators do not have financial conflicts of interest in making permit decisions.

This is not regulated specifically by the mining regulations, though financial conflicts of interest are prohibited by general state government ethics rules.

15. Public funds may not be committed to financing or assisting project development until environmental review is completed.

Nothing in the law prohibits the state from financing or entering into agreements with projects undergoing environmental review.

16. Financial assurance is calculated transparently and well-before any permit is issued.

DNR makes the financial assurance calculations, but may bring in an outside consultant if needed and all calculations are public. The bond is filed after application is approved but before the state issues authority to begin mining activities. Wis. Stat. §293.51.

17. Financial assurance, including its amount and devices, is developed collaboratively with financial as well as environmental expertise.

Given the lack of experience in this area, there is not enough data to evaluate the state’s performance.

D. ONTARIO

Currently, there is no permit approval review process required for mining in Ontario. Although a closure plan is mandated prior to advanced exploration or mining operations, the Ministry of Northern Development and Mines does not have the authority to approve or reject the closure plan. There are review processes associated with environmental assessment and for permits/approvals needed under related environmental legislation (e.g., Ontario *Water Resources Act*). In each of these situations, the technical materials and data submitted by the proponent are generally not publicly available without undergoing potentially expensive and time-consuming freedom of information requests. Financial assurance information specifically is unavailable publicly. There is some integration of review processes, though for environmental assessment in particular cooperation between the federal and provincial government is voluntary. First Nations have limited ability to influence the review process. Some aspects of the review process for

mining in Ontario may change in the future, if the government fully implements legislative amendments that enable a permit requirement for advanced exploration.

Overall grade: Poor

1.	The state or province requires applicants and permittees to submit supporting data sufficient to provide for meaningful and substantive review of the application or request.	NO
2.	The state or province is supportive of and cooperative with other applicable regulatory regimes including federal and tribal governments.	SOME
3.	The state or province has an integrated process for assessing applications integrating input. The process should include cross-disciplinary review and input from fellow agencies that is unhampered by political pressure.	NO
4.	The state facilitates and incorporates feedback from public participation in all aspects of environmental review, application assessment, permitting and enforcement.	NO (Mine); SOME (related approvals)
5.	Consent by any impacted First Nation is required for mine approval.	NO
6.	Standards and criteria are concrete, clear and easily enforced. Self-realizing standards are best (like the WI “Prove it first” law).	NO (Mine); SOME (related approvals)
7.	Standards for reclamation and remediation are in place prior to mining; the applicant must demonstrate that they can be met prior to an application gaining approval.	SOME (standards); NO (gaining approval)
8.	Government-to-government consultation results in tribal requests being integrated into the permitting process and enforceable.	NO
9.	The state or province denies permits if they do not meet the regulatory standards.	NO (Mine); SOME (related approvals)
10	All state or province analytical materials and data are available to the	SOME

	public.	
11.	The state or province requires that all data supporting an application be available to the public.	SOME
12.	The state or province supplements applicant-provided data with its own, independently-gathered data.	NO (Mine); YES (related approvals)
13.	First Nations impacted by a mine proposal have delegated authority, if desired by the First Nation, for regulation and enforcement of environmental standards and adequate resources to pursue that authority.	NO
14.	The state or province ensures that regulators do not have financial conflicts of interest in making permit decisions.	YES
15.	Public funds may not be committed to financing or assisting project development until environmental review is completed.	NO
16.	Financial assurance is calculated transparently and well-before any permit is issued.	NO (transparency); YES (before mining)
17.	Financial assurance, including its amount and devices, is developed collaboratively with financial as well as environmental expertise.	Unknown

Discussion:

1. The state or province requires applicants and permittees to submit supporting data sufficient to provide for meaningful and substantive review of the application or request.

There currently is no permit/approval process for mines in Ontario. The closure plan, which must be submitted prior to advanced exploration or mining operations, must include details on a variety of environmental impacts of the mine site.¹⁴²

2. The state or province is supportive of and cooperative with other applicable regulatory regimes including federal and tribal governments.

¹⁴² *Mine Development and Closure Under Part VII of the Act*, O. Reg. 240/00, Schedule 2.

The *Canada-Ontario Agreement on Environmental Assessment Cooperation* provides for voluntary cooperation and coordination of processes for approval, when both a federal and provincial environmental assessment is required.¹⁴³ The most comprehensive environmental assessment process is a Joint Review Panel (JRP). As detailed under the “Siting and Buffers” (Criterion 1, Regulation Scope, above), there have been recent JRPs that have employed sustainability criteria and JRP is very infrequently employed. The first ever JRP for an Ontario mine has been commenced to assess the proposed Marathon Platinum Group Metals and Copper Mine Project (August 2011, Environmental Assessment Registry Number 10-05-54755).

3. The state or province has an integrated process for assessing applications integrating input. The process should include cross-disciplinary review and input from fellow agencies that is unhampered by political pressure.

There currently is no permit/approval process for mines in Ontario. Closure plans are required for many advanced exploration and mining operations.¹⁴⁴ When a proponent submits a closure plan, it is reviewed by the Ministry of Northern Development and Mines with a “one window” approach. The proponent engages only with the Ministry of Northern Development and Mines, and then the Ministry distributes information to other regulatory agencies (such as the Ministry of the Environment, Ministry of Natural Resources, Ministry of Labour, and the federal Department of Fisheries and Ocean), municipalities, and potentially impacted aboriginal communities. Each of these organizations may have knowledge or information related to the site which it uses in addition to the information provided by the proponent. However, the closure plan process is one in which the project proponent (not the government) certifies that the closure plan complies with all of the legislative requirements.

4. The state facilitates and incorporates feedback from public participation in all aspects of environmental review, application assessment, permitting and enforcement.

As detailed under the “Siting and Buffers” (Criterion 1, Regulation Scope, above), aspects of the mining project may come under federal or provincial environmental assessment processes. However, components of a mining operation are often exempted from environmental assessment or only considered in a piecemeal fashion. Many environmental assessments are subject to a “screening” process, which has no public participation component. Other forms of environmental assessment have some public notice and request for comment. The most involved public participation happens in public hearings, which can occur both provincially and federally.

Public notice regarding advanced exploration is not mandatory, but can be required at the discretion of the Director.¹⁴⁵ Public notice regarding mining operations is required.¹⁴⁶ None of

¹⁴³ *Canada-Ontario Agreement on Environmental Assessment Cooperation* available on-line at: <http://www.ceaa.gc.ca/default.asp?lang=En&n=F4591D20-1>.

¹⁴⁴ *Mining Act*, R.S.O. 1990, c. M.14, subsection 140(3).

¹⁴⁵ *Mining Act*, R.S.O. 1990, c. M.14, subsections 140(1), (2).

¹⁴⁶ *Mining Act*, R.S.O. 1990, c. M.14, subsection 141(1).

these provisions states what the Director is to do with the public comment, or even if there is an opportunity for public comment. However, since a closure plan must be filed prior to commencing advanced exploration or mining operations and because the “acknowledgement of receipt of closure plan” is an instrument under Ontario’s *Environmental Bill of Rights*, there is a mandatory public participation process.¹⁴⁷ A regulation sets out procedure for public notification under sections 140 and 141 of the *Mining Act*, including public information sessions.¹⁴⁸ The proponent must provide the Director with the names of the members of the public who attended the information session, and must also provide the Director with any written comments provided by those members no later than 15 days after the session.¹⁴⁹ The *Mining Act* provides a process for disputing the validity of a mining claim and for resolving disputes between persons with respect to unpatented mining claims.¹⁵⁰

5. Consent by any impacted First Nation is required for mine approval.

The purpose of the Ontario *Mining Act* is to encourage mining in a manner that is consistent with the recognition and affirmation of existing Aboriginal and treaty rights under section 35 of the Constitution, including the duty to consult.¹⁵¹ The Supreme Court of Canada has suggested that the duty to consult may require the consent of an Aboriginal community where a potential infringement of Aboriginal rights or title is very serious.¹⁵²

A yet-to-be-proclaimed section of the Ontario *Mining Act* will allow the Minister to consider, when deciding whether to withdraw lands from staking and prospecting, whether the lands meet the prescribed criteria as a site of Aboriginal cultural significance.¹⁵³ The Minister is not, however, required to do so. Also, a yet-to-be-proclaimed section of the Ontario *Mining Act* will allow the Minister to restrict the claim holder’s right to use portions of the surface of an unpatented mining claim if those portions are on lands that meet the prescribed criteria for a site of Aboriginal cultural significance.¹⁵⁴ Yet-to-be-made regulations under Ontario’s *Mining Act* may prescribe required levels of Aboriginal consultation before an exploration plan can be submitted (and thus before any mining activities can occur on a claim).¹⁵⁵ Aboriginal consultation may also be prescribed and may need to be completed before an exploration permit can be obtained.¹⁵⁶ The updated versions of sections 140 and 141 of the Ontario *Mining Act*, which are not yet in force, require consultation with affected Aboriginal communities in

¹⁴⁷ *Environmental Bill of Rights, 1993*, S.O. 1993, c. 28, Part II and *Classification of Proposals for Instruments*, O.Reg 618/94, section 12.

¹⁴⁸ *Mine Development and Closure Under Part VII of the Act*, O. Reg. 240/00, section 8.

¹⁴⁹ *Mine Development and Closure Under Part VII of the Act*, O. Reg. 240/00, subsection 8(3).

¹⁵⁰ *Mining Act*, R.S.O. 1990, c. M.14, sections 48 and 110.

¹⁵¹ *Mining Act*, R.S.O. 1990, c. M.14, section 2.

¹⁵² *Delgamuukw v. British Columbia*, [1997] 3 S.C.R. 1010 at para 168.

¹⁵³ *Mining Act*, R.S.O. 1990, c. M.14, subsection 35(2).

¹⁵⁴ *Mining Act*, R.S.O. 1990, c. M.14, subsection 51(4).

¹⁵⁵ *Mining Act*, R.S.O. 1990, c. M.14, section 78.2.

¹⁵⁶ *Mining Act*, R.S.O. 1990, c. M.14, section 78.2.

accordance with the regulations.¹⁵⁷ Once in force, no advanced exploration or mining activity can occur until this requirement is satisfied.

6. Standards and criteria are concrete, clear and easily enforced. Self-realizing standards are best (like the WI “Prove it first” law).

There are no self-realizing standards for mining, but standards related to effluent limits are clear.¹⁵⁸ Federally, there are no site-specific effluent standards for mining. When issuing an Environmental Compliance Approval (ECA) for the mining sector, the Ontario Ministry of the Environment applies both overarching regulations and policies (e.g., *Effluent Monitoring and Effluent Limits – Metal Mining Sector*) and site specific regulatory requirements (e.g., effluent limits and monitoring based on the nature of the contaminants of concern and quality of the receiving environment).¹⁵⁹

7. Standards for reclamation and remediation are in place prior to mining; the applicant must demonstrate that they can be met prior to an application gaining approval.

There is no approval process for mines in Ontario. A closure plan must be submitted before advanced exploration or mining operations can occur; the plan must be certified (by the proponent) and the Director of the Ministry of Northern Development and Mines must have received it and confirmed receipt in writing.¹⁶⁰

8. Government-to-government consultation results in tribal requests being integrated into the permitting process and enforceable.

No formal regulations currently exist that address First Nation requests. New regulations are to be developed under Ontario’s *Mining Act* that will set requirement regarding aboriginal consultation and accommodation (See Criterion 5, above).

9. The state or province denies permits if they do not meet the regulatory standards.

There currently is no permitting process for mines in Ontario. Once new provisions of the Ontario *Mining Act* come into force, the Director of Exploration for the Ministry of Northern Development and Mines will be able to deny an exploration permit if Aboriginal consultation has not occurred; all activities covered by the exploration permit must comply with the terms of the permit; and the Director will have the discretion to decide whether to grant an exploration permit, and also to determine the terms and conditions attaching to that permit.¹⁶¹

¹⁵⁷ *Mining Act*, R.S.O. 1990, c. M.14, sections 140, 141.

¹⁵⁸ *Metal Mining Effluent Regulations*, SOR/2002-222 and *Effluent Monitoring and Effluent Limits – Metal Mining Sector*, O. Reg. 560/94.

¹⁵⁹ Personal communication with Dean Therrien, Supervisor of Issues Management, Operations Division, Office of the Deputy Minister of the Environment (e-mail dated December 12, 2011).

¹⁶⁰ *Mining Act*, R.S.O. 1990, c. M.14, sections 140, 141.

¹⁶¹ *Mining Act*, R.S.O. 1990, c. M.14, section 78.3(2).

For related approvals under other environmental laws, the province denies permits if the proponent is not able to meet the regulatory standards. For example, for a Permit to Take Water under the *Ontario Water Resources Act*, the Director of the Ministry of the Environment has discretion to “issue, refuse to issue or cancel a permit” and “impose such terms and conditions in issuing a permit ... and may alter the terms and conditions of a permit after it is issued.”¹⁶²

10. All state or province analytical materials and data are available to the public.

Technical materials and the associated data generally can only be accessed by the public through formal freedom of information requests. Sometimes, technical materials are available to the public during the approvals process (e.g., an environmental assessment); however, viewing the materials often requires that the individual attend at a specific office during limited business hours. Data regarding non-compliance with approvals under related environmental legislation (e.g., the *Ontario Water Resources Act*) is publicly available (See Criterion 7, Enforcement, below), as is pollutant reporting through the National Pollutant Releases Inventory (See Criterion 2, Reporting and Official Statements, below). The financial and commercial information pertaining to financial assurance is confidential and not subject to a freedom of information request.¹⁶³

11. The state or province requires that all data supporting an application be available to the public.

See Criterion 10, above. Records pertaining to claims staked are available to the public, including any personal information.¹⁶⁴

12. The state or province supplements applicant-provided data with its own, independently-gathered data.

The Ministry of Northern Development and Mines does not supplement the proponent’s information with its own. The proponent certifies that the submitted closure plan complies with all legal requirements.

In approvals associated with related environmental legislation the Ontario Ministry of the Environment relies on the applicant’s documentation for site specific information, and also supplements this information with applicable Guidelines, Best Management Practices and

¹⁶² *Ontario Water Resources Act*, R.S.O. 1990, c. O.40, subsection 34(6).

¹⁶³ *Mining Act*, R.S.O. 1990, c. M.14, subsections 145(10), (11).

¹⁶⁴ *Mining Act*, R.S.O. 1990, c. M.14, subsections 7(4), (5).

consistency with similar projects.¹⁶⁵ The Ministry of the Environment may also verify data through its own monitoring programs, modeling and site visits.¹⁶⁶

13. First Nations impacted by a mine proposal have delegated authority, if desired by the First Nation, for regulation and enforcement of environmental standards and adequate resources to pursue that authority.

There is no such authority in Ontario.

14. The state or province ensures that regulators do not have financial conflicts of interest in making permit decisions.

Officers appointed under Ontario's *Mining Act*, including the Director and recorders of the Ministry of Northern Development and Mines, are not permitted to purchase or become interested in, either directly or indirectly, any mining lands, claims, or rights in Ontario unless the Deputy Minister waives this requirement because he or she is convinced the acquisition was in good faith.¹⁶⁷ A closure plan submitted to the Ministry of Northern Development and Mines must contain a number of certificates; any certificate required for the closure plan must disclose details of any direct or indirect interest, current or expected, the person providing the certificate or a person providing information to the certifying person has in the proponent's project or in the projects of the corporate proponent's affiliates, including direct or indirect beneficial ownership of securities of the proponent or its affiliates.¹⁶⁸

15. Public funds may not be committed to financing or assisting project development until environmental review is completed.

If an undertaking is subject to an individual environmental assessment, section 12.2 of the Ontario *Environmental Assessment Act* applies. This section provides what types of activities are permitted, and which are not allowed, prior to environmental assessment approval. In most circumstances, loans, grants, subsidies or guarantees by the province are prohibited in respect of an undertaking seeking individual environmental assessment. This legislative section does not apply to projects approved by Class Environmental Assessments. Mining projects are currently not subject to the Ontario *Environmental Assessment Act* (See also "Siting and Buffers", Criterion 1, Regulation Scope, above).

16. Financial assurance is calculated transparently and well-before any permit is issued.

¹⁶⁵ Personal communication with Dean Therrien, Supervisor of Issues Management, Operations Division, Office of the Deputy Minister of the Environment (e-mail dated December 12, 2011).

¹⁶⁶ Personal communication with Dean Therrien, Supervisor of Issues Management, Operations Division, Office of the Deputy Minister of the Environment (e-mail dated December 12, 2011).

¹⁶⁷ *Mining Act*, R.S.O. 1990, c. M.14, section 12.

¹⁶⁸ *Mine Development and Closure Under Part VII of the Act*, O. Reg. 240/00, subsection 12(4)(e).

Financial assurance is calculated in the closure plan, which must be submitted before advanced exploration or mining operations can begin.¹⁶⁹ Financial assurance is not calculated transparently, as documents relating to financial assurance are confidential and not subject to public scrutiny, even through freedom of information requests.¹⁷⁰

17. Financial assurance, including its amount and devices, is developed collaboratively with financial as well as environmental expertise.

Proponents can effectively self-assure through corporate financial tests, and this does not require any environmental input.¹⁷¹ The closure plan must contain a certificate signed by the proponent (or the senior officers of a corporate proponent) certifying that the cost estimates of rehabilitation work in the plan are based on market value cost of the goods and services required by the work, that the closure plan contains the full amount of rehabilitation work that will be required, and that the amount of financial assurance is sufficient to cover the cost of the rehabilitation work.¹⁷² Presumably, this would require environmental expertise to determine the amount of work required and the devices needed. Although the Ontario Ministry of Northern Development and Mines reviews the closure plan, it is the proponent that certifies the financial assurance covers the cost of rehabilitation.

¹⁶⁹ *Mining Act*, R.S.O. 1990, c. M.14, section 145.

¹⁷⁰ *Mining Act*, R.S.O. 1990, c. M.14, subsections 145(10), (11).

¹⁷¹ *Mining Act*, R.S.O. 1990, c. M.14, section 145.

¹⁷² *Mine Development and Closure Under Part VII of the Act*, O. Reg. 240/00, subsection 12(2).

3. ENFORCEMENT

A regulatory structure is only as strong as its enforcement, including the mechanisms and powers granted to the regulators and whether and how the regulators actually use them. An ideal enforcement system gives regulators the tools and resources to enforce the standards set forth in statutes, rules and permits, and to ensure that deviations from or violations of those standards are reversed and adequately punished so as to deter future violations. In addition to having the authority, staff, and money to enforce the law, a meaningful enforcement system must have regulators capable of and committed to enforcement.

It is important to note that the lack of experience in regulating sulfide mines in the jurisdictions surveyed leaves a lack of certain data in this area. Until sulfide mines are permitted, operate, and close under the existing laws, it is impossible to say how a jurisdiction actually and fully enforces its laws and permit conditions, and this report does not speculate on such issues. Furthermore, we recognize that the strength of enforcement may depend to some extent on the political climate in a jurisdiction, and may therefore ebb and flow with legislative and executive changes. However, there is at least some experience to work from in some jurisdictions, and the basic capacity for enforcement is very clearly set out in the statutory authorization, staffing and funding of each jurisdiction's sulfide mining program.

In all states, a mine operator/owner holding a Clean Water Act (CWA) wastewater/stormwater permit will be subject to CWA penalties for violating those permits, including monetary sanctions and stop orders. In all states, citizens can sue operators for violations of CWA permits, with attorneys' fees awarded to successful plaintiffs. In all states, the CWA allows citizen intervention in NPDES permit, 404 and 401 appeals. This system of regulation operates in parallel with the mining permit enforcement scheme in each U.S. jurisdiction, but there is little to no operational overlap. For a review of states' CWA enforcement mechanisms, see the Water Quality Report at Appendix A.

1. The state or province has adequate enforcement policies in place, including authorization to: issue stop orders and corrective action orders, to assess civil penalties, to impose costs of inspections, and attorney and staff costs. States should have written enforcement policies that are available to the public.
2. The state or province provides for citizen intervention in state enforcement actions and for citizen suits, with attorney's fees for prevailing citizens.
3. The state or province allows citizen intervention in state proceedings. States allow citizens to intervene in permit proceedings or appeals and in state suits.
4. The state or province facilitates an atmosphere in which environmental protection is the top priority of the regulatory scheme and those charged with implementing it; agencies do not view themselves or act like agents of the industry.
5. The state or province has adequate enforcement capabilities, including dedicated staff time and expertise.

6. The state or province requires personnel to conduct inspections and enforcement of mining and cleanup operations sufficiently frequently and ensures that problems are addressed promptly.
7. Citizens have access to all enforcement data.
8. Reclamation, enforcement and monitoring are enabled beyond the life of the permit.
9. Post-closure enforcement is strong, with adequate resources and public involvement.
10. Immediate independent judicial review is available to citizen plaintiffs.
11. Citizens can initiate and participate in inspections.
12. Parent and successor corporations and other materially participating entities are obligated to assume permit requirements.
13. Permit conditions and work plans are reviewed at least annually.
14. The agency has authority to modify permit conditions whenever necessary (“adaptive management”), and exercises that authority as needed.
15. Any permit variances, amendments, or changes requested by the permittee are rare and uncontested.

A. MICHIGAN

Michigan’s law provides a number of enforcement capabilities to DEQ, though it provides less than complete access and responsiveness to citizen concerns and complaints. There is also significant room for improving the specificity and requirements for monitoring ongoing operations. It remains to be seen whether and how the state will exercise this authority.

Overall Grade: Fair/Difficult to assess at this time

1	The state or province has adequate enforcement policies in place, including authorization to: issue stop orders and corrective action orders, to assess civil penalties, to impose costs of inspections, and attorney and staff costs. States should have written enforcement policies that are available to the public.	SOME
2	The state or province provides for citizen intervention in state enforcement actions and for citizen suits, with attorney’s fees for prevailing citizens.	SOME
3	The state or province allows citizen intervention in state proceedings. States allow citizens to intervene in permit proceedings or appeals and in state suits.	YES
4	The state or province facilitates an atmosphere in which environmental protection is the top priority of the regulatory scheme and those charged with implementing it; agencies do not view themselves or act like agents of the industry.	NO
5	The state or province has adequate enforcement capabilities, including dedicated staff time and expertise.	NO
6	The state or province requires personnel to conduct inspections and enforcement of mining and cleanup operations sufficiently frequently and ensures that problems are addressed promptly.	NO
7	Citizens have access to all enforcement data.	SOME
8	Reclamation, enforcement and monitoring is enabled beyond the life of the permit.	YES
9	Post-closure enforcement is strong, with adequate resources and public involvement.	N/A
10	Immediate independent judicial review is available to citizen plaintiffs.	NO
11	Citizens can initiate and participate in inspections.	SOME
12	Parent and successor corporations and other materially participating entities are obligated to assume permit requirements.	SOME
13	Permit conditions and work plans are reviewed at least annually.	N/A
14	The agency has authority to modify permit conditions whenever necessary (“adaptive management”), and exercises that authority as needed.	YES, N/A
15	Any permit variances, amendments, or changes requested by the permittee are rare and uncontested.	NO

DISCUSSION:

1. The state or province has adequate enforcement policies in place, including authorization to: issue stop orders and corrective action orders, to assess civil penalties, to impose costs of inspections, and attorney and staff costs. States should have written enforcement policies that are available to the public.

Sulfide mine operators are subject to a number of financial and operational sanctions for violating their permit conditions, statutes, or administrative rules. These include:

Stop orders: Part 632 authorizes the DEQ to order an immediate suspension of mining activities if the permittee is in violation of the permit, the statute or regulations, and such violation is “causing or resulting in an imminent and substantial endangerment to the public health or safety, environment, or natural resources... .” MCL §324.63221(2). In this case, “the department shall take action necessary to abate or eliminate the endangerment ...” which may include “(b) Issuing an order to the operator requiring immediate suspension of activities at the mining site” Id.

Corrective action orders: DEQ is authorized to order the permittee to take corrective action. If the permittee is in violation of the permit, the statute or the regulations, “the department **shall** require the operator to correct the violation.” MCL §324.63221(1).

Civil penalties: DEQ may bring a civil action via the state Attorney General against a permittee/violator in circuit court to seek a court-ordered restraint on the violation, require compliance, and/or a civil penalty of at least \$2,500 and up to \$25,000 per day of violation. §324.63223(1). However, DEQ cannot issue a civil penalty on its own, i.e., without a judicial order. If the court finds the operator has violated the statute, rule, permit, or department order and has caused a “substantial endangerment to the public health, safety or welfare”, the court shall impose an **additional** sanction of at least \$500,000 and up to \$5,000,000. MCL §324.63223(2). Also, the Attorney General may seek an additional payment from the court to compensate for the injuries done to the natural resources of the state and the costs of the state’s surveillance and enforcement activities. MCL §324.63223(3). Finally, criminal penalties are established and available for intentional false statements on applications for a mining permit or any notice or report required by the permit. MCL 324.63223(4).

Cost of inspection charged to permittee: Permittees are assessed a fee of “not more than 5 cents per ton of material mined [...] but not less than \$5,000.00, for each calendar year the mine is in operation and during the post-closure monitoring period.” MCL §324.63215(a). This fee is authorized for “purposes of surveillance, monitoring, administration, and enforcement of this part” Id. The chapter also creates a “nonferrous metallic mineral surveillance fund” in the state treasury, to receive deposits of the permittee’s fees. MCL §324.63217.

Attorney/staff costs: The cost of regulating permittees, including any attorney fees for departmental litigation, is funded only by the surveillance fund (see above). However, these fees are not charged directly to the permittee if they exceed the funds available in the surveillance fund.

Written policy available to public: DEQ maintains an environmental assistance center with phone number and an emergency spill hotline, but there is no handbook or written policy on citizen options/actions specifically regarding sulfide mining. The regulations and statute are the only real source of official information.

2. The state or province provides for citizen intervention in state enforcement actions and for citizen suits, with attorney’s fees for prevailing citizens.

Michigan allows citizen intervention and court review of state enforcement actions, but does not allow for direct citizen suits of a violator of Michigan's mining law, regulations, or permit.

Any person who is "aggrieved by an order, action, or inaction of the department ..." may request a contested case hearing before the Department pursuant to the Michigan Administrative Procedures Act ("MAPA"). MCL §§ 24.201 to 328; and §324.63219. This language is broadly written to encompass enforcement actions, allowing citizens to seek redress before DEQ when it fails to administer the statutes or rules properly in an enforcement action or permitting decision. The agency's decision in such a case is then appealable to the courts. However, it is unlikely that a citizen successfully petitioning in such a case would be compensated her attorney's fees. MAPA awards attorney's fees and costs to a non-agency party prevailing in the contested case only if the agency's position in the case was "frivolous," MCL §24.323(1), and only to the extent that the agency caused the prevailing party to incur those costs and fees. MCL §24.323(5).

There is no provision for direct citizen suits against an alleged violator of the mining statute, rules, or mining permit. However, if the permittee is violating its NPDES permit, the Clean Water Act does allow for direct citizen suits against the violator.¹⁷³

3. The state or province allows citizen intervention in state proceedings. States allow citizens to intervene in permit proceedings or appeals and in state suits.

Citizens may intervene in permit proceedings, and in limited circumstances in state suits where they meet stringent standing requirements. In a permit proceeding, any person who is aggrieved "... by the issuance, denial, revocation, or amendment of a mining permit" may petition for a contested case hearing before the Department. MCL § 324.63219(1).

Intervention in appeals or suits by the state is not authorized by statute, but is allowed generally if the intervenor meets the specific standing requirements of the Michigan Rules of Civil Procedure. Michigan Court Rules, 2.201. These require that the intervenor claim "an interest relating to the property or transaction which is the subject of the action and is so situated that the disposition of the action may as a practical matter impair or impede the applicant's ability to protect that interest, unless the applicant's interest is adequately represented by existing parties." Id.

4. The state or province facilitates an atmosphere in which environmental protection is the top priority of the regulatory scheme and those charged with implementing it; agencies do not view themselves or act like agents of the industry.

The existence of Part 632, dedicated to protecting the environment and human health from the potential dangers of sulfide mining sets the regulatory tone for the department. The state's role is to allow only those activities that are environmentally sound and ensure the permittee provides a contingency plan and funds for any problems. However, the political and legal fight over the progress of the Kennecott Eagle project is evidence that many in the department do not see it this way. Opponents of that project have alleged extreme mismanagement of the law by administrative personnel in both the Mining and Clean Water programs. The atmosphere at this point in time is charged with a great deal of suspicion and mistrust.

¹⁷³ See Water Quality Report, Appendix A.

5. The state or province has adequate enforcement capabilities, including dedicated staff time and expertise.

Given the lack of enforcement experience, this cannot yet fully be evaluated. However, DEQ currently staffs the nonferrous mining program with only 1-1.5 full-time equivalent employees, and was operating at or beyond its capacity through the Eagle mine application review. It is reasonable to doubt that this number will be capable of overseeing the operational Eagle mine, plus at least one new full application, exploration of multiple new sites, and potentially many additional permit applications.

6. The state or province requires personnel to conduct inspections and enforcement of mining and cleanup operations sufficiently frequently and ensures that problems are addressed promptly.

There is no provision requiring periodic or regular inspections; inspections are required by law only on receipt of an allegation or notification of a permit violation. MCL § 324.63221(7)(b); R 425.408. The state's mining program coordinator, however, believes that inspections are required quarterly. In either case, the law and rules as written do not provide specific guidelines for inspections or thresholds for action in the case of potential permit violations.

7. Citizens have access to all enforcement data.

The project's annual report will be posted automatically, but any other information would only be available on request.

8. Reclamation, enforcement and monitoring are enabled beyond the life of the permit.

Post-closure monitoring is required for 20 years, subject to extension as needed or until the "self-sustaining ecosystem" goal is met. MCL 324.63209(6). Post-closure monitoring must be part of the reclamation plan filed with the initial application.

9. Post-closure enforcement is strong, with adequate resources and public involvement.

Resources for post-closure monitoring are assured through continued financial assurance (MCL § 324.63211(1), Rule 425.301(1)) and a surveillance fee (MCL § 324.63215). However, given the lack of experience with a post-closure scenario, this criterion cannot be evaluated as of yet.

10. Immediate independent judicial review is available to citizen plaintiffs.

There is no citizen suit provision; citizen complaints must go through the administrative review process first.

11. Citizens can initiate and participate in inspections.

Citizen participation in state-led inspections is not specifically permitted. The only way to "initiate" a state DEQ inspection would be to file an allegation or report to initiate a departmental investigation, but citizens cannot force the state to investigate nor participate actively in inspections. Non-agency personnel are allowed to participate in DEQ inspections under certain circumstances but only with the permission of the mine operator (property owner).

Citizens may find a more direct route to participation in inspections through their local governments. Local governments have an unfettered right to conduct water quality monitoring, even if such monitoring duplicates, contradicts or conflicts with Part 632. MCL §324.63203(5).

12. Parent and successor corporations and other materially participating entities are obligated to assume permit requirements.

MCL § 324.63207(4) sets conditions for transfer of a permit, requiring public notice and continued compliance with statute and regulations. Agency staff asserts that in practice, the mining permit must be transferred on sale or transfer of the project and the new owner/operator must assume responsibility for permit conditions, though this is not explicit in the statute.

13. Permit conditions and work plans are reviewed at least annually.

The permittee must file an annual “Mining and Reclamation Report” during operation and through the post-closure period. (Rule 425.501(1)). The report must contain, among other things, an updated (as needed) contingency plan, report of monitoring, leak detection, inspection and leachate collection for the preceding year. Agency staff assert that the agency naturally will review the report and react as needed. However, this is not required anywhere in statute or rule and has not yet been tested in practice, so this criterion cannot yet be evaluated fully.

14. The agency has authority to modify permit conditions whenever necessary (“adaptive management”), and exercises that authority as needed.

DEQ has the authority, but as of yet has no experience in this area. “The department may require the permittee to submit an application for amendment of the mining permit if the department determines that the terms and conditions of the mining permit are not providing the intended reasonable protection of the environment, natural resources, or public health and safety.” MCL § 324.63207(6)(b); R 425.206. If the department determines the amendment will be a “material change,” it will subject the amendment to the same review process as a new permit application (found at R 425.201(4)). R425.206(4).

In practice, DEQ has not independently required alteration of a permit condition, though it has altered the Eagle mine permit already at Kennecott’s independent request. Whether DEQ will exercise its authority at the appropriate time(s) in the future remains to be seen.

15. Any permit variances, amendments, or changes requested by the permittee are rare and uncontested.

The ability of the DEQ to approve permit changes without a formal public process is a major weakness in Michigan’s enforcement system. In its only experience to date, the Eagle mine permit, DEQ has approved several changes to the permit at Kennecott’s request without giving a full opportunity for public comment and without a full review. Full review (i.e., the same review process as provided for new permit applications) is required only where DEQ determines the request would be a “significant change” to the permit. R 425.206(4). With each of Kennecott’s five sets of proposed amendments, DEQ determined that the request was not a significant change, thereby not meriting a full review.¹⁷⁴ The requested changes included the

¹⁷⁴ Amendment approval letters are available on the DEQ website: http://www.michigan.gov/deq/0,1607,7-135-3311_4111_18442-130551--,00.html. Accessed December 21, 2011. DEQ did hold one public meeting regarding a proposed amendment, but this was not a formal process as outlined in the rules and was still deemed not a “significant change” by DEQ.

addition of a communications tower, the extension of electrical power to the mine property, a change in location and increase in size of a rock storage area and wastewater treatment plant, a change in location and deepening of contact water basins, and etc. These changes drew significant public criticism but were all approved without formal hearings.

B. MINNESOTA

Minnesota’s enforcement scheme empowers the agency to take nearly unfettered and immediate enforcement action against a permit violator. However, it falls short in not requiring a strong or regular inspection schedule, and in limiting citizen intervention with a high bar for establishing standing.

Overall grade: Fair.

1	The state or province has adequate enforcement policies in place, including authorization to: issue stop orders and corrective action orders, to assess civil penalties, to impose costs of inspections, and attorney and staff costs. States should have written enforcement policies that are available to the public.	YES
2	The state or province provides for citizen intervention in state enforcement actions and for citizen suits, with attorney’s fees for prevailing citizens.	SOME
3	The state or province allows citizen intervention in state proceedings. States allow citizens to intervene in permit proceedings or appeals and in state suits.	SOME
4	The state or province facilitates an atmosphere in which environmental protection is the top priority of the regulatory scheme and those charged with implementing it; agencies do not view themselves or act like agents of the industry.	SOME
5	The state or province has adequate enforcement capabilities, including dedicated staff time and expertise.	N/A
6	The state or province requires personnel to conduct inspections and enforcement of mining and cleanup operations sufficiently frequently and ensures that problems are addressed promptly.	NO
7	Citizens have access to all enforcement data.	YES
8	Reclamation, enforcement and monitoring is enabled beyond the life of the permit.	YES
9	Post-closure enforcement is strong, with adequate resources and public involvement.	N/A
10	Immediate independent judicial review is available to citizen plaintiffs.	NO
11	Citizens can initiate and participate in inspections.	SOME
12	Parent and successor corporations and other materially participating entities are obligated to assume permit requirements.	YES
13	Permit conditions and work plans are reviewed at least annually.	YES
14	The agency has authority to modify permit conditions whenever necessary (“adaptive management”), and exercises that authority as needed.	YES, N/A
15	Any permit variances, amendments, or changes requested by the permittee are rare and uncontested.	N/A

DISCUSSION:

1. The state or province has adequate enforcement policies in place, including authorization to: issue stop orders and corrective action orders, to assess civil penalties, to impose costs of inspections, and attorney and staff costs. States should have written enforcement policies that are available to the public.

Minnesota grants the DNR many tools and options to enforce its rules and statutes including, notably, the ability to assess monetary penalties directly (i.e., without a court order).

Stop orders: The commissioner of DNR may suspend operations (i.e., the entire permit) or any portion(s) of the permit “if the commissioner finds it necessary in an emergency to protect the public health or safety or to protect public interests in lands or waters against imminent danger of substantial injury in any manner or to any extent not expressly authorized by the permit, or to protect persons or property against such danger” Minn. Stat. § 93.481, subd 4(d); Minn. Rules 6132.4500, subpt 1. The suspension order is limited to 30 days, unless the permittee is given at least 10 days written notice and an opportunity to be heard at a formal hearing. Minn. Stat., §93.481, subd D; 6132.4500, subpt 3.

Corrective action orders – In addition to or as an alternative to a stop order under §93.481, the commissioner may order a permittee to “take all measures necessary to prevent or remedy the emergency situation.” Minn. Stat. §93.481, subd 4(d); Minn. Rules 6132.4500, subpt 2. Further, and more specifically, on observation or reporting of a violation of the permit or the rules, the DNR is not only permitted but required by statute to order the permittee to take immediate corrective action (where there is imminent danger) or submit an action plan within 2 weeks. Minn. Rules 6132.3100; and see Minn. Stat. § 93.481, subd 4(d).

Civil penalties – Civil penalties may be assessed directly by DNR if the permittee violates any provisions of the applicable statutes, rules, or permit for at least 15 days after being noticed of such failure or after the expiration of time for corrective action. Minn. Stat. § 93.51, subd 1; Minn. Rules 6132.5100. There is no minimum penalty, but penalties are capped at \$1,000 per day of violation. Id.

Cost of inspection charged to permittee: DNR has authority to monitor through the construction phase and charge its costs of inspection directly to the permittee. Minn. Stat. § 93.482, subd 2. There is no provision, however, for recovering inspection costs after construction. The permittee also pays for all monitoring required by the NPDES permit, including sample collection and analysis.

Attorney/staff costs charged to permittee: The application fee of \$50,000 plus the annual operating fee goes into an account dedicated to funding DNR’s mining program. The annual fee is static, set at \$37,500 for the first year and \$75,000 for every year thereafter, including post-closure years. Minn. Stat. § 93.482, subd 1(c). Also, the applicant is directly billed the department’s costs of reviewing the permit application or a variance request and will not be granted a permit until those costs are paid in full. Minn. Stat. § 93.482, subd 2.

Enforcement policy available to public: DNR’s enforcement policy is available only as written in the regulations and statute.

2. The state or province provides for citizen intervention in state enforcement actions and for citizen suits, with attorney’s fees for prevailing citizens.

Citizens have access to state enforcement action under limited circumstances (i.e., when they have standing), but citizen suits are not directly authorized. Citizens are allowed to participate in hearings (should they occur) on “substantial” permit variance requests (which are treated the same as a new application, Minn. Rules 6132.4100) or a modification initiated by the department, or suspension or revocation of a permit, all of which must follow the general administrative contested case rules. Minn. Rules 6132.5000. Under those rules, a person may intervene in a contested case only with standing (their rights, duties or interests are directly affected by the case) or the judge may allow public participation and input at her discretion, without creating a party interest. Minn. Rules 1400.6200.

Citizen suits are not directly allowed by statute. However, citizens have right to sue agencies generally under the MAPA if objecting to a final agency action in a contested case in which they participated, Minn Stat. 14.63 et seq., or to a rule (as written) or application of a rule. Minn. Stat. 14.44 et seq. Additionally, the Minnesota Environmental Rights Act, Minn.Stat. ch.116B, contains general citizens’ suit provisions that should apply to the enforcement of mining permit conditions.

3. The state or province allows citizen intervention in state proceedings. States allow citizens to intervene in permit proceedings or appeals and in state suits.

Citizens can intervene in permit proceedings and state suits, but only after meeting quite onerous standing requirements. An intervenor in a permit review process must show that she owns property that will be affected by the proposed operation; is a federal, state or local government agency with responsibilities affected by the proposed operation; or raises material issue(s) of fact and there is a reasonable basis that holding a hearing would allow relevant info to come to light that would aid the commissioner in resolving the issue. Minn. Rules 6132.4000, subpt 2 (C)(1-3). In a state suit, intervention is not permitted specifically by statute but is permitted generally under the Minnesota Rules of Civil Procedure if the intervenor has an interest directly affected by the action or could seek the court’s permission to intervene if she presents a question of law or fact in common with the main action. Minn. Rules of Court, Rule 24.

4. The state or province facilitates an atmosphere in which environmental protection is the top priority of the regulatory scheme and those charged with implementing it; agencies do not view themselves or act like agents of the industry.

This is a question of perspective. Many environmentalists see the state as extremely pro-industry, citing its treatment of the PolyMet project. They point to the \$4 million loan for land acquisition by a state development board, and to the way that PolyMet’s application is being handled. There is a significant, if as-yet unsubstantiated, fear that the state will fail to regulate the industry as required by law. On the other hand, the state has still not approved the PolyMet application and state regulators interviewed for this project do not see themselves as agents of industry but rather as protectors of the state’s resources and as technical experts.

5. The state or province has adequate enforcement capabilities, including dedicated staff time and expertise.

Given the lack of enforcement experience with a working sulfide mine, this cannot be fully analyzed yet. However, with only 3-4 FTE employees ready to work on the program, and given the number of applications expected and extensive exploratory activity underway in northern Minnesota, it is reasonable to suspect the program will eventually be understaffed. Also, as noted later in this report, there may be a shortage of technical expertise in the mining program due to the recent retirement of senior agency personnel.

6. The state or province requires personnel to conduct inspections and enforcement of mining and cleanup operations sufficiently frequently and ensures that problems are addressed promptly.

The state conducts inspections at least annually (in conjunction with review of the permittee's annual report.) Permittees are required not to interfere. This is only slightly more regular than Wisconsin and Michigan's rules, which do not set any guidelines or specific schedules but leave the inspection up to the department. There is therefore significant room to improve monitoring and inspection regulations.

7. Citizens have access to all enforcement data.

All data, submissions and reports are available to the public under the Data Practices Act. Minn. Stat. §13.03. The only exception is information that the permittee has specially requested be kept confidential; that is a formal process under the Data Practices Act that must be reviewed by the Commissioner of the Department of Administration. Minn. Stat. §13.06.

8. Reclamation, enforcement and monitoring are enabled beyond the life of the permit.

Administrative rules detail extensive and thorough closure and post-closure maintenance requirements. Minn. Rules 6132.3200. The requirements here are much more detailed than in Michigan or Wisconsin, including specific steps of closure e.g., when access road and storage pads must be removed, access that must be available for monitoring, sealing of the shaft, etc.

9. Post-closure enforcement is strong, with adequate resources and public involvement.

Post-closure enforcement is well-detailed in the rules (see above criterion), but public involvement is informal and ad hoc, just as in the regular operations phase. Given the lack of experience with a post-closure scenario, this criterion cannot be fully evaluated yet.

10. Immediate independent judicial review is available to citizen plaintiffs.

There is no citizen suit allowed by law; a citizen must go through the regular administrative complaint and review process, as detailed above.

11. Citizens can initiate and participate in inspections.

Citizens cannot initiate inspections, but in theory they could participate (though this has never yet been requested in Minnesota). If accompanying state employees, citizens would need the same MSHAW training to be on site, unless perhaps there is an agent of the permittee on site leading the inspection. In any case, the state would also require the permittee's and/or landowner's permission before allowing a citizen to observe an inspection.

12. Parent and successor corporations and other materially participating entities are obligated to assume permit requirements.

Minnesota requires a successor/purchaser to be assigned the mining permit and take on the responsibilities therein. The permit may be assigned to a successor “only if the commissioner determines that the assignee will perform all outstanding obligations of law [under the chapter] and the permit to mine.” R6132.4700

13. Permit conditions and work plans are reviewed at least annually.

The permittee’s annual report forces the department to consider “whether it complies with the provisions of the permit to mine.” R6132,4000, subpt 5.

14. The agency has authority to modify permit conditions whenever necessary (“adaptive management”), and exercises that authority as needed.

The DNR has the authority to modify permit conditions when necessary to correct dangerous conditions, when the permittee is violating the permit or the rules, or when new information related to reclamation becomes available that needs to be addressed and added to the permit to mine. R6132.4300. Since Minnesota has never permitted a nonferrous mine, there has been no opportunity to exercise this authority as yet.

15. Any permit variances, amendments, or changes requested by the permittee are rare and uncontested.

Given the lack of experience in this area, this cannot be answered yet.

C. WISCONSIN

Wisconsin’s enforcement procedures and authority are the most extensive of any jurisdiction surveyed, and include open access to citizen suits and intervention in any state proceeding.

Overall Grade: Good.

1	The state or province has adequate enforcement policies in place, including authorization to: issue stop orders and corrective action orders, to assess civil penalties, to impose costs of inspections, and attorney and staff costs. States should have written enforcement policies that are available to the public.	YES
2	The state or province provides for citizen intervention in state enforcement actions and for citizen suits, with attorney’s fees for prevailing citizens.	YES
3	The state or province allows citizen intervention in state proceedings. States allow citizens to intervene in permit proceedings or appeals and in state suits.	YES
4	The state or province facilitates an atmosphere in which environmental protection is the top priority of the regulatory scheme and those charged with implementing it; agencies do not view themselves or act like agents of the industry.	SOME
5	The state or province has adequate enforcement capabilities, including dedicated staff time and expertise.	N/A

6	The state or province requires personnel to conduct inspections and enforcement of mining and cleanup operations sufficiently frequently and ensures that problems are addressed promptly.	NO
7	Citizens have access to all enforcement data.	YES
8	Reclamation, enforcement and monitoring is enabled beyond the life of the permit.	YES
9	Post-closure enforcement is strong, with adequate resources and public involvement.	N/A
10	Immediate independent judicial review is available to citizen plaintiffs.	YES
11	Citizens can initiate and participate in inspections.	SOME
12	Parent and successor corporations and other materially participating entities are obligated to assume permit requirements.	YES
13	Permit conditions and work plans are reviewed at least annually.	YES
14	The agency has authority to modify permit conditions whenever necessary (“adaptive management”), and exercises that authority as needed.	YES, N/A
15	Any permit variances, amendments, or changes requested by the permittee are rare and uncontested.	N/A

DISCUSSION:

1. The state or province has adequate enforcement policies in place, including authorization to: issue stop orders and corrective action orders, to assess civil penalties, to impose costs of inspections, and attorney and staff costs. States should have written enforcement policies that are available to the public.

Wisconsin’s statutes authorize the DNR and the Department of Justice to take a variety of actions against violators of state statutes, rules, or state-issued permits. Wis. Stat. §§ 293.83, 293.85, 293.87, 293.89; NR 132.16. In certain cases, the DNR is authorized to take immediate action or assess civil penalties of its own accord, and in others state courts must render the order.

Stop orders: DNR is required to issue a stop order requiring the immediate cessation of mining, in whole or part, any time DNR determines the continuance of mining constitutes an immediate and substantial threat to public health and safety or the environment. Wis. Stat. § 293.83(4). Within five days after the stop order is issued, DNR must notify the operator and hold a hearing to determine whether to affirm, modify or set aside the stop order. Wis. Stat. § 293.83(4)(b).

Corrective action orders: If the DNR “finds” a violation of law or any unapproved deviation from the mining or reclamation plan, it is required by statute to either issue an order requiring the operator to comply “within a specified time,” require the operator to appear at a hearing and answer charges complained of, or request the department of justice to initiate an action. Wis. Stat. § 293.83(1).

Civil penalties: Civil penalties may be assessed by any circuit court (when brought by the Department of Justice) for a number of specific statutory or rule violations. These include:

False, misleading, or incomplete statements: A person making a false or misleading statement or failing to make an annual report or refusing to submit information required by the permit is liable for between \$1,000-\$5,000. Wis. Stat. § 293.87(2).

Permittee's violation of a statute or rule: A permitted prospecting or mining operator in violation of any order issued or rule adopted thereunder is liable for at least \$10 and up to \$10,000 per day, per violation. Wis. Stat. § 293.87(3)

General violation of a statute or rule: Any person (including those not holding mining or prospecting permits) who violates any rule, order, or permit thereunder, is liable for at least \$10 and up to \$5,000 per day, per violation. Wis. Stat. § 293.87(4).

Cost of inspection charged to permittee: The cost of inspections by the Wisconsin Department of Justice may be charged to permittee if a violation is found. Wis. Stat. § 293.87(4)(b). There is no provision, however, for DNR to directly recover its costs of any regular inspection or monitoring of the permittee; only the cost review of the application to mine and preparing the EIS is covered directly by the permittee.

Attorney/staff costs charged to permittee: Any enforcement action taken by the Department of Justice may be charged to the violator via a court order of attorney's fees and reasonable costs associated with investigation and enforcement activities. Wis. Stat. § 293.87(4)(b). There is no provision, however, for DNR to recover its enforcement or litigation costs, aside from its initial application review costs which are charged directly to the applicant. The applicant also pays for the costs incurred by the state agencies preparing the EIS, though this money goes into the state's general fund and is not specifically earmarked for the mining program. Wis. Stat. §293.32;

Additional Enforcement Powers: Wisconsin's statute deals severely with operators who fail to comply with their reclamation obligations. DNR is also required by statute to take over reclamation activities in certain situations where the permittee is unwilling or unable to do so, and to cancel any prospecting or mining permits held by an operator who refuses to reclaim a site in accordance with the plan.

DNR takeover of reclamation activities: If reclamation is not proceeding in accordance with the plan and the operator fails to rectify the problem within the time set by the department; OR if reclamation is not complete in conformance with the plan 1 year after completion or abandonment of the mining site; OR if the exploration or prospecting permit is revoked, then the department shall take actions necessary to reclaim the site and the operator is liable for the state's costs in doing so. Wis. Stat. § 293.83(2).

Cancellation of other permits: The department shall cancel any other prospecting or mining permits held by, and shall not issue any other mining or prospecting permits to, an operator who refuses to reclaim a site in accordance with the reclamation plan. Wis. Stat. § 293.83(3).

Written policy available to public: DNR's general enforcement procedures (not specific to mining or sulfide mining) are available online.¹⁷⁵ However, this does not describe people's rights or options in permit application participation or other appeals or intervention in the enforcement

¹⁷⁵ Enforcement procedures are available online at <http://dnr.wi.gov/org/es/enforcement/envenf.htm>. Accessed December 28, 2011.

or judicial processes. Those details are found only in the regulations and statutes. There is also a hotline and email for reporting violations.

2. The state or province provides for citizen intervention in state enforcement actions and for citizen suits, with attorney's fees for prevailing citizens.

Wisconsin authorizes both citizen suits and citizen intervention in state enforcement actions. Any citizen may file suit against either a person allegedly in violation of Wis. Stat. §293 or against DNR for failing to perform any nondiscretionary act under the statute. Wis. Stat. § 293.89. If the department is already prosecuting a civil or criminal action against the operator, the citizen cannot commence an independent suit but may intervene as a matter of right in that suit. Wis. Stat. § 293.89(2)(a)(2). Attorney's fees and costs shall be awarded to a winning plaintiff. Wis. Stat. § 293.89(3). The statute also calls for treble damages awarded to a plaintiff who incurs damages as a result of non-permitted mining, or a willful violation of the statute, regulation, or order. Id.

Any person may also seek administrative review of any decision of the department made under Chapter 293, pursuant to the Administrative Procedure and Review statutes. Wis. Stat. § 227; Wisc Stat. § 293.95. According to the rules, the complaint to the department must be made by 6 or more individuals, and will result in a public hearing on the allegation. NR 132.16(1).

3. The state or province allows citizen intervention in state proceedings. States allow citizens to intervene in permit proceedings or appeals and in state suits.

Wisconsin allows for citizen intervention without any standing bars. The state allows citizen intervention without a standing requirement in permit or prospecting application review. Every mining or prospecting permit application will be reviewed in a hearing; public notice will be given and "[p]ersons who wish to participate as parties shall file a written notice with the hearing examiner setting forth their interest ..." and may express their opinions or facts related to the application orally or in writing. Wis. Stat. § 293.43(5)(b).

If the department is already prosecuting a civil or criminal action against the operator, the citizen cannot commence an independent suit but may intervene as a matter of right in that suit without establishing special standing. Wis. Stat. § 293.89(2)(a)(2).

4. The state or province facilitates an atmosphere in which environmental protection is the top priority of the regulatory scheme and those charged with implementing it; agencies do not view themselves or act like agents of the industry.

The "prove it first" requirement ostensibly demonstrates the state's emphasis on environmental protection. Wis. Stat. § 293.50. While there are moves underway to change the mining law in Wisconsin (in favor of development), this is so far restricted specifically to ferrous mining. As in Minnesota, there is a split perspective on the intent and outlook of the regulators, many environmental groups questioning their resources and motivations, based in part on the treatment of the cleanup of the Flambeau mine.

5. The state or province has adequate enforcement capabilities, including dedicated staff time and expertise.

Given the lack of experience in this area, this cannot be answered yet.

6. The state or province requires personnel to conduct inspections and enforcement of mining and cleanup operations sufficiently frequently and ensures that problems are addressed promptly.

No provision of statute or regulation requires regular inspections. However, the department must do an annual review of permit conditions and department staff asserts that the department would do very frequent inspections (if there were any mines in operation). At the Flambeau mine, DNR staff monitored every day during construction and a couple times per week during the first year, then about weekly for the life of the mine.¹⁷⁶ However, there are no guidelines or specifications for these inspections, so as with Michigan, the state's requirements are at best minimal.

7. Citizens have access to all enforcement data.

Citizens have access to all data and reports, through all phases: permitting, operation and post-closure.

8. Reclamation, enforcement and monitoring are enabled beyond the life of the permit.

Wisconsin provides a model for post-closure enforcement and permitting. Operators must monitor and manage the mining site for a minimum 24 years after closure, and a reclaimed mine waste disposal facility must be maintained and monitored for at least 40 years.¹⁷⁷ After the mining period ends and reclamation begins, the rules require a new permit for waste management and reclamation activities.¹⁷⁸ NR 182.09. The operator must submit a plan of operation for the reclamation activities, including detailed schematics and plans for pollution control from tailings, etc. NR 182.09(2).

The regulations also provide a series of minimum standards for the design of the waste management system, all designed for maximum environmental protection. NR 182.11. Agency personnel may inspect the waste disposal facility at any time; operators are required to inspect the entire operation on a weekly basis and log the results; active dams are to be inspected monthly (with specific requirements for inspection); and any "potentially defective condition" found in an inspection must be reported as soon as possible to the department, including a proposed correction action. NR 182.12(6). The department is authorized to conduct its own monitoring of the waste disposal facility or require the operator to conduct monitoring of a set of physical indicators including groundwater and leachate, surface water, physical features (vegetations, subsidence, etc.), and shall require the operator to submit an operations report to assess the effectiveness and environmental acceptability of the operation. The operator is also required to keep an operating log documenting the course of the operation, how much material is disposed of, monitoring data, and so on. NR 182.14. Monitoring data is submitted to the department quarterly, and the operator must also submit an annual report summarizing the operation's cumulative and annual data. NR 182.14.

9. Post-closure enforcement is strong, with adequate resources and public involvement.

¹⁷⁶ Larry Lynch, *supra* note 31.

¹⁷⁷ For more information regarding waste disposal requirements, see DNR's factsheets at <http://www.dnr.state.wi.us/org/aw/wm/mining/metallic/infosheets/dnr-per.pdf>. Accessed December 14, 2011.

¹⁷⁸ Alternately, if the mine waste is to be deposited back into the closed mine, the operator must submit a plan of operation for the backfilling and reclamation along with the original mining permit.

Post-closure enforcement is strong as written (see discussion above, at Criterion #8). However, given the lack of experience with a post-closure scenario, this criterion cannot be fully evaluated yet.

10. Immediate independent judicial review is available to citizen plaintiffs.

Citizen suits are permitted. (See discussion above at Criterion #2)

11. Citizens can initiate and participate in inspections.

This is not specifically permitted by statute or rule. A citizen could file an allegation or report to initiate an investigation. But, contrary to Michigan's Rule 425.408, the department would not then be required to take action based on an allegation of wrongdoing. Non-agency personnel are allowed to participate in state inspections under certain circumstances but only with the permission of the mine operator (property owner).

12. Parent and successor corporations and other materially participating entities are obligated to assume permit requirements.

When one corporation or party succeeds to the interest of the mining operator before completion of the project, the original operator is released from all responsibility only when the successor takes on the permit conditions and meets all the original requirements for operators. Wisc Stat. §293.5.

13. Permit conditions and work plans are reviewed at least annually.

DNR is required to review the mining and reclamation plans annually. If changed conditions indicate that the reclamation plan may not function successfully, the department shall require the operator to submit a proposed amended plan. NR 132.12.

14. The agency has authority to modify permit conditions whenever necessary ("adaptive management"), and exercises that authority as needed.

DNR has the authority to modify conditions if it finds the plan no longer sufficient. It must in that situation order the operator to file an amended plan which will be reviewed the same as an original application. NR 132.12. However, whether a mining permit would be modified as per the statute at the appropriate time(s) remains to be seen.

15. Any permit variances, amendments, or changes requested by the permittee are rare and uncontested.

Given the lack of experience in this area, this cannot be answered yet.

D. ONTARIO

Currently, there is no permit approval required for mining in Ontario. The assessment of enforcement is therefore limited to permits/approvals that are issued for activities related to mining by the Ministry of the Environment and to the required mine closure plans that are filed with the Ministry of Northern Development and Mines. There is some ability for citizens to participate in the enforcement of permits/approvals. However, there are barriers to participation which include difficulties accessing information and cost consequences of conducting litigation. There are no provincial funding mechanisms to enable intervention and participation in

government decision-making, though the latter is a citizen right under Ontario’s *Environmental Bill of Rights*.

Overall Grade: Fair

1	The state or province has adequate enforcement policies in place, including authorization to: issue stop orders and corrective action orders, to assess civil penalties, to impose costs of inspections, and attorney and staff costs. States should have written enforcement policies that are available to the public.	SOME
2	The state or province provides for citizen intervention in state enforcement actions and for citizen suits, with attorney’s fees for prevailing citizens.	SOME
3	The state or province allows citizen intervention in state proceedings. States allow citizens to intervene in permit proceedings or appeals and in state suits.	SOME
4	The state or province facilitates an atmosphere in which environmental protection is the top priority of the regulatory scheme and those charged with implementing it; agencies do not view themselves or act like agents of the industry.	NO
5	The state or province has adequate enforcement capabilities, including dedicated staff time and expertise.	SOME
6	The state or province requires personnel to conduct inspections and enforcement of mining and cleanup operations sufficiently frequently and ensures that problems are addressed promptly.	SOME
7	Citizens have access to all enforcement data.	SOME
8	Reclamation, enforcement and monitoring is enabled beyond the life of the permit.	SOME
9	Post-closure enforcement is strong, with adequate resources and public involvement.	SOME NO (water quality)
10	Immediate independent judicial review is available to citizen plaintiffs.	SOME
11	Citizens can initiate and participate in inspections.	SOME
12	Parent and successor corporations and other materially participating entities are obligated to assume permit requirements.	YES
13	Permit conditions and work plans are reviewed at least annually.	SOME
14	The agency has authority to modify permit conditions whenever necessary (“adaptive management”), and exercises that authority as needed.	NO
15	Any permit variances, amendments or changes requested by the permittee are rare and uncontested.	N/A

DISCUSSION:

1. The state or province has adequate enforcement policies in place, including authorization to: issue stop orders and corrective action orders, to assess civil penalties, to impose costs of inspections, and attorney and staff costs. States should have written enforcement policies that are available to the public.

Stop Orders and Corrective Action Orders: Where a court convicts a person of an offence under the *Mining Act*, it has the discretion to impose a number of penalties in addition to the prescribed fine, jail time, or other prescribed penalty.¹⁷⁹ This discretion includes the ability to impose an order requiring a person to take such action as the court directs. The court may also include conditions in the order that it considers “appropriate to prevent similar unlawful conduct or to contribute to rehabilitation of the person.”¹⁸⁰ In addition, the Minister and Director of the Ministry of Northern Development and Mines have the power to make various orders under different provisions of Part VII of the *Mining Act*.¹⁸¹ For example, subsection 139.3(5) of the *Mining Act* gives the Director of the Ministry of Northern Development and Mines the power to order a person to rehabilitate a mine hazard in accordance with a rehabilitation plan. Under subsection 143(2) of the *Mining Act*, the Director of the Ministry of Northern Development and Mines may order that a proponent file a closure plan. Under subsection 143(3) of the *Mining Act*, the Director of the Ministry of Northern Development and Mines may order that a closure plan be changed. Under subsection 145(2) of the *Mining Act*, the Director of the Ministry of Northern Development and Mines may order that a required rehabilitation measure be carried out, or provide for its being carried out, and that this be paid for out of the financial assurance. And, under section 148 of the *Mining Act*, the Minister of the Ministry of Northern Development and Mines has the authority to order the immediate rehabilitation of any mine hazard deemed likely to cause an immediate and dangerous adverse effect. In addition, the Director of the Ministry of Northern Development and Mines may, at any time, apply to a judge of the Superior Court of Justice for an order prohibiting advanced exploration, mining or mine production on a site where a person has failed to comply with sections 140, 141, 143(1), or 144(2) of the *Mining Act*.¹⁸²

Where a person is convicted of an offence under the *Fisheries Act*, the court has the power to, among other things, prohibit any activity by the person that may result in the continuation or repetition of the offence; and directing the person to take appropriate action to avoid harming fish or fish habitat.¹⁸³ Contravention of such an order is an offence punishable under section 79.6 of the *Fisheries Act*.

The Director of the Ministry of the Environment can issue control orders and stop orders where a provincial officer’s report states that a facility has discharged a contaminant in violation of the regulations (control order) or where the Director believes on reasonable and probable grounds that a discharge is occurring that constitutes an immediate danger to human life, health, or property (stop order).¹⁸⁴ Section 17 of the *Environmental Protection Act* allows the Director of the Ministry of the Environment to order remedial measures where a discharge of a contaminant has occurred and caused damage. Section 18 of the *Environmental Protection Act* allows the Director of the Ministry of the Environment to require a person to take preventative measures to prevent damage from occurring.

Civil Penalties: There are no civil penalties under the *Mining Act* in Ontario, but in 2005, civil “environmental penalties” were enabled under Ontario’s *Environmental Protection Act* and

¹⁷⁹ *Mining Act*, R.S.O. 1990, c. M.14, subsections 164(7), (8).

¹⁸⁰ *Mining Act*, R.S.O. 1990, c. M.14, subsection 164(8).

¹⁸¹ *Mining Act*, R.S.O. 1990, c. M.14, Part VII.

¹⁸² *Mining Act*, R.S.O. 1990, c. M.14, subsection 167(3).

¹⁸³ *Fisheries Act*, R.S.C. 1985, c. F-14, section 79.2.

¹⁸⁴ *Environmental Protection Act*, R.S.O. 1990, c. E.19, sections 7, 8, 17, 18.

Ontario Water Resources Act.¹⁸⁵ Environmental penalties apply equally to metal mining operations and can be assessed immediately when there are spills.¹⁸⁶ Also, there are penalties for various offences set out in the *Mining Act* and the federal *Fisheries Act*; fines may be imposed upon conviction.¹⁸⁷ Under the *Fisheries Act*, the owners of any substance deleterious to fish are responsible for all costs reasonably incurred by the Crown for measures taken to prevent such a deposit or to remedy the harm caused by the deposit.¹⁸⁸ Further, anyone found to have deposited a substance deleterious to fish is liable to licensed commercial fishermen for any loss of income resulting from the deposit. All such loss is recoverable with costs in proceedings in any court of competent jurisdiction.¹⁸⁹

Costs of Inspections: Inspections are not charged to the mine operator/owner, though the Minister of the Ministry of Northern Development and Mines is authorized to establish and charge fees in respect of anything that a person or entity is authorized or required to do under the *Mining Act*.¹⁹⁰ However, where an inspection related to a survey of mining claims is ordered, the fee is payable in advance¹⁹¹ and the Minister may require that the applicant supply the inspector with transportation to and from the site.¹⁹²

Federally, where a person is convicted of an offence under the Act, they may be ordered to pay the Minister of the Department of Fisheries and Oceans the costs incurred in the seizure, storage, or disposition of any fish or other thing seized in relation to the offence; presumably one such cost would be the cost of doing the inspection where the thing was seized.¹⁹³

Attorney Costs: A person who appeals to the Mining and Lands Commissioner under section 112 of the *Mining Act* may have a hearing, and the Commissioner may award costs to any party in such a proceeding.¹⁹⁴ In addition, section 122 of the *Mining Act* allows the Commissioner to order that security for costs be posted.

Staff Costs: As noted above, the Minister of the Ministry of Northern Development and Mines may establish fees for anything that a person or entity is authorized or required to do under the *Mining Act*,¹⁹⁵ but this authority has not been used to charge for staff costs. Though the regulations set a minimum value of assessment work to be performed on mining claims that are not leases,¹⁹⁶ it is not clear whether these fees are directed to support the mining program.

¹⁸⁵ *Environmental Protection Act*, R.S.O. 1990, c. E.19, section 182.1. *Ontario Water Resources Act*, R.S.O. 1990, c. O.40, section 106.1.

¹⁸⁶ Links to the legislation, guidance documents, and annual reports regarding environmental penalties is available on-line:
http://www.ene.gov.on.ca/environment/en/industry/compliance_and_enforcement/environmental_penalties/index.htm

¹⁸⁷ *Mining Act*, R.S.O. 1990, c. M.14, sections 164-170. *Fisheries Act*, R.S.C. 1985, c. F-14, sections 40, 42.

¹⁸⁸ *Fisheries Act*, R.S.C. 1985, c. F-14, subsections 42(2).

¹⁸⁹ *Fisheries Act*, R.S.C. 1985, c. F-14, subsections 42(3).

¹⁹⁰ *Mining Act*, R.S.O. 1990, c. M.14, section 177.1.

¹⁹¹ *Mining Act*, R.S.O. 1990, c. M.14, subsections 95(7), (8).

¹⁹² *Mining Act*, R.S.O. 1990, c. M.14, subsection 95(8).

¹⁹³ *Fisheries Act*, R.S.C. 1985, c. F-14, section 71.1.

¹⁹⁴ *Mining Act*, R.S.O. 1990, c. M.14, sections 126, 127.

¹⁹⁵ *Mining Act*, R.S.O. 1990, c. M.14, section 177.1.

¹⁹⁶ *Assessment Work*, O. Reg. 6/96, respectively.

Written Enforcement Policies Available to the Public: The Ministry of Northern Development and Mines does not make enforcement policies publicly available. The Ministry of the Environment does.¹⁹⁷

2. The state or province provides for citizen intervention in state enforcement actions and for citizen suits, with attorney's fees for prevailing citizens.

With leave of the Court, a citizen can intervene in provincial enforcement actions.¹⁹⁸ Citizen suits have been enabled by the Ontario *Environmental Bill of Rights*.¹⁹⁹ There is no funding available for interventions and citizen suits. Participating in these activities hold the usual risks of adverse costs awards.

3. The state or province allows citizen intervention in state proceedings. States allow citizens to intervene in permit proceedings or appeals and in state suits.

With leave of the Court, a citizen may participate in provincial civil actions.²⁰⁰ There is also a mechanism for citizens to participate in decision-making regarding prescribed permitting and related appeals.²⁰¹ Because there is no permit issued for mining, these latter rights of participation and appeal are only associated with the Ministry of Northern Development and Mines's acceptance of closure plans. There is no funding available for interventions and citizen suits, and these activities hold the usual risks of adverse costs awards.

4. The state or province facilitates an atmosphere in which environmental protection is the top priority of the regulatory scheme and those charged with implementing it; agencies do not view themselves or act like agents of the industry.

The general purpose of the Act is to encourage mining.²⁰² The atmosphere is not one in which environmental protection is the top priority.

5. The state or province has adequate enforcement capabilities, including dedicated staff time and expertise.

Officials from the Ministry of Northern Development and Mines and the Ministry of the Environment indicate that they have adequate enforcement capabilities.²⁰³ However, the Environmental Commissioner of Ontario has expressed concern that there are not adequate

¹⁹⁷ Ministry of the Environment. *Compliance Policy: Applying Abatement and Enforcement Tools*. May 2007. Publication PIBS 6248, Queen's Printer for Ontario. Available on-line: http://www.ene.gov.on.ca/stdprodconsume/groups/lr/@ene/@resources/documents/resource/std01_079163.pdf.

¹⁹⁸ Ontario Court of Justice Criminal Proceedings Rules (SI/92-99), Rule 27.06. <http://laws.justice.gc.ca/eng/regulations/SI-92-99/FullText.html>.

¹⁹⁹ *Environmental Bill of Rights, 1993*, S.O. 1993, c.28. In particular, see harm to a public resource (Part VI) and the clarification regarding standing for public nuisance (section 103).

²⁰⁰ *Rules of Civil Procedure*, R.R.O. 1990, Regulation 194, Rule 13.

²⁰¹ *Environmental Bill of Rights, 1993*, S.O. 1993, c.28. In particular, see public participation in government decision making (Part II) and appeals of instruments (sections 38-48).

²⁰² *Mining Act*, R.S.O. 1990, c. M.14, section 2.

²⁰³ Personal communication with Laura Blondeau, Communications Director, Office of the Minister of Northern Development, Mines and Forestry (e-mail dated November 10, 2011) and Dean Therrien, Supervisor of Issues Management, Operations Division, Office of the Deputy Minister of the Environment (e-mail dated December 12, 2011).

enforcement capabilities in the Ministry of Natural Resources and the Ministry of the Environment.²⁰⁴

6. The state or province requires personnel to conduct frequent inspections and enforcement of mining and cleanup operations sufficiently frequently and ensures that problems are addressed promptly.

Part X of the *Mining Act* sets out the powers and duties of inspectors, but does not set the frequency of inspection.²⁰⁵ The inspectors may gather information and make inspections or inquiries at any time without warrant, and persons must allow the inspectors to carry out these duties. Although not technically provincial enforcement, the Mine Rehabilitation Code contains various inspection requirements. For instance, the proponent must inspect a site put into a state of temporary suspension at least every six months to ensure rehabilitation measures are in place.²⁰⁶ An official from the Ministry of Northern Development and Mines indicated that inspections are conducted on a priority ranking basis.²⁰⁷ Those sites of higher risk are inspected more frequently and sites entering closure are of the highest priority to ensure that they are closed out in accordance with the Code.²⁰⁸

Inspectors may be appointed by the Minister of the federal Department of Fisheries and Oceans to ensure compliance with the prohibition on deposition of deleterious substances in fish habitat or waters frequented by fish.²⁰⁹ Again, no mention is made regarding frequency of inspections.

The owner or operator of a mine is required to notify an inspector without delay where tests indicate prescribed limits of contaminants in effluent have been exceeded, where the pH of the effluent is less than 6.0 or greater than 9.5, or where the effluent is acutely lethal.²¹⁰ No mention is made of frequency of inspection by government inspectors. The Ministry of the Environment uses a risk-based inspection strategy that focuses on operations with higher potential for environmental impact.²¹¹ Planned inspections, not limited to mine properties, are developed at the beginning of each year based on information such as: local, provincial and ministry priorities and commitments; place-based assessments; compliance trends, and past performance.²¹² The Ministry of the Environment inspects mining properties and associated tailings areas as frequently as required based on known risks and non-compliance.²¹³ As part of these inspections, Ministry of the Environment staff will collect effluent samples in order to assess compliance with established regulatory limits.²¹⁴

²⁰⁴ Environmental Commissioner of Ontario. 2007. *Doing Less with Less: How shortfalls in budget, staffing and in-house expertise are hampering the effectiveness of MOE and MNR, ECO Special Report, 2007*. Toronto, ON : Environmental Commissioner of Ontario. http://www.ecoissues.ca/index.php/Doing_Less_with_Less.

²⁰⁵ *Mining Act*, R.S.O. 1990, c. M.14, Part X (Inspections) (sections 156 – 163).

²⁰⁶ *Mine Development and Closure Under Part VII of the Act*, O. Reg. 240/00, Schedules 1, 2.

²⁰⁷ Personal communication with Laura Blondeau, Communications Director, Office of the Minister of Northern Development, Mines and Forestry (e-mail dated November 10, 2011).

²⁰⁸ *Id.*

²⁰⁹ *Fisheries Act*, R.S.C. 1985, c. F-14, section 38.

²¹⁰ *Metal Mining Effluent Regulations*, SOR/2002-222, section 24.

²¹¹ Personal communication with Dean Therrien, Supervisor of Issues Management, Operations Division, Office of the Deputy Minister of the Environment (e-mail dated December 12, 2011).

²¹² *Id.*

²¹³ *Id.*

²¹⁴ *Id.*

7. Citizens have access to all enforcement data.

The Ontario *Mining Act* provides for public access to some records and restricts public access to other records.²¹⁵ More generally, there is access to some enforcement data such as *Metal Mining Effluent Regulations* reports and Ministry of the Environment non-compliance reports. Data regarding enforcement is not generally available. And, at least one nongovernmental organization has been told by Environment Canada that the *Metal Mining Effluent Regulations* reports and information regarding the Environmental Effects Monitoring program will require a formal request under the *Access to Information Act* (R.S.C., 1985, c. A-1).²¹⁶

8. Reclamation, enforcement and monitoring is enabled beyond the life of the permit.

Part 10 of the *Mine Development and Closure Regulation* prescribes details regarding monitoring that must be included in the closure plan, which presumably extend beyond the life of the permit.²¹⁷ Some sections of the Mine Rehabilitation Code (e.g. section 15) require ongoing monitoring. According to an official from the Ministry of Northern Development and Mines, ongoing monitoring of physical and environmental hazards may be required (depending on the type of mine feature or hazard) to ensure the stability of the rehabilitation measures.²¹⁸ The closure plan must indicate if the rehabilitation of a project will require long-term ongoing monitoring and testing, and there must be adequate financial assurance provided to ensure funds will be available in the future to cover those ongoing requirements.²¹⁹

Monitoring must continue even when a project is placed into temporary suspension.²²⁰ When a project is placed into inactivity, all tailings, rock piles, overburden piles, stockpiles, landfill sites and other waste management sites and systems must be monitored and maintained, or rehabilitated.²²¹ Once a site is placed into inactivity, it must be monitored at least once every six months to ensure that rehabilitative measures are in place.²²²

9. Post-closure enforcement is strong, with adequate resources and public involvement.

The Ministry of Northern Development and Mines has a Rehabilitation, Compliance and Inspection Office, which is empowered to ensure that post-closure management is conducted in “a manner consistent with sound environmental and public safety closure designs and to limit accrual of public risk and liability.”²²³ The Rehabilitation, Compliance and Inspection Office staff “audit closure plans as required under Part VII of the *Mining Act*; monitor and inspect rehabilitation works; ensure that operating mines are rehabilitated by mine owners in accordance to the legislative standards of the province; investigates occurrences [*sic*] of non-compliance of the *Mining Act*; develop regulations, policies, procedures, guidelines and standards in order to administer Part VII of the *Mining Act* in a fair and consistent manner.”²²⁴

²¹⁵ *Mining Act*, R.S.O. 1990, c. M.14, sections 7(4), (5), 145(10), (11).

²¹⁶ Personal communication with Ramsey Hart, MiningWatch Canada (December 6, 2011).

²¹⁷ *Mine Development and Closure Under Part VII of the Act*, O. Reg. 240/00, Schedules 1, 2.

²¹⁸ Personal communication with Laura Blondeau, Communications Director, Office of the Minister of Northern Development, Mines and Forestry (e-mail dated November 10, 2011).

²¹⁹ *Id.*

²²⁰ *Mine Development and Closure Under Part VII of the Act*, O. Reg. 240/00, subsection 22(2)(5).

²²¹ *Mine Development and Closure Under Part VII of the Act*, O. Reg. 240/00, subsections 23(2)(8), 23(3).

²²² *Mine Development and Closure Under Part VII of the Act*, O. Reg. 240/00, subsections 23(2)(8), 23(3).

²²³ Mine Rehabilitation website: http://www.mndm.gov.on.ca/mines/mg/mine_rehabilitation_e.asp.

²²⁴ Mine Rehabilitation website: http://www.mndm.gov.on.ca/mines/mg/mine_rehabilitation_e.asp.

Regarding water pollution, on the other hand, the *Environmental Protection Act* regulation ceases to apply to a metal mining plant ten days after it ceases production.²²⁵

10. Immediate independent judicial review is available to citizen plaintiffs.

An application for judicial review may be brought within thirty days regarding any of the following: a provincial mining recorder's decision, an order or judgment of the Mining, and Lands Commissioner, and anything done by a provincial mining recorder or other officer.²²⁶

Upon submission of a closure plan, citizen plaintiffs are barred from the *Environmental Bill of Rights* provisions that allow third-party appeals and from judicially reviewing the decision.

11. Citizens can initiate and participate in inspections.

There is no mechanism in the *Mining Act* to initiate an inspection. However, if there is an imminent contravention of environmental legislation, any two residents of Ontario can request an investigation under the *Environmental Bill of Rights*.²²⁷ An inspection warrant can authorize any person to accompany an inspector on an inspection.²²⁸

12. Parent and successor corporations and other materially participating entities are obligated to assume permit requirements.

A closure plan cannot be assigned without the Ministry of Northern Development, Mine and Forestry Director's consent, and is binding on the heirs, successors, and permitted assigns of the proponent.²²⁹ When amendments to the *Mining Act* come into force, the recipient of a proponent's rights (pursuant to an exploration plan or permit) will be bound by the terms of the exploration plan or permit, and is also liable for the rehabilitation of the mine as per section 78.6.²³⁰

13. Permit conditions and work plans are reviewed at least annually.

Mine owners are required to send annual (or if requested, quarterly) reports regarding mine activities to the Minister of Northern Development, Mines and Forestry.²³¹ When amendments to the *Mining Act* come into force, the Director may amend or renew exploration permits.²³² No timeline is established for the review of these new permits.

14. The agency has authority to modify permit conditions whenever necessary ("adaptive management"), and exercises that authority as needed.

Currently, there is no permit for mining in Ontario. When amendments to the *Mining Act* come into force the Director may amend or renew exploration permits after consideration of the

²²⁵ *Effluent Monitoring and Effluent Limits – Metal Mining Sector*, O. Reg. 560/94, subsection 3(5).

²²⁶ *Mining Act*, R.S.O. 1990, c. M.14, section 135.

²²⁷ *Environmental Bill of Rights, 1993*, S.O. 1993, c.28, Part V (Application for Investigation). Inadequate response to the Application for Investigation is a prior condition to making use of the citizen suit provision under the *Environmental Bill of Rights*.

²²⁸ *Mining Act*, R.S.O. 1990, c. M.14, section 158.

²²⁹ *Mining Act*, R.S.O. 1990, c. M.14, subsection 153.2(6).

²³⁰ *Mining Act*, R.S.O. 1990, c. M.14, sections 78.4, 78.6.

²³¹ *Mining Act*, R.S.O. 1990, c. M.14, section 155.

²³² *Mining Act*, R.S.O. 1990, c. M.14, subsection 78.3(5).

following: the purpose of the Act, whether Aboriginal consultation has occurred, any arrangement with surface rights owners, and any other prescribed circumstances.²³³

15. Any permit variances or changes requested by the permittee are rare and uncontested.

Until such time as permitting is enabled in Ontario, there cannot be an assessment of this criterion.

²³³ *Mining Act*, R.S.O. 1990, c. M.14, subsection 78.3(5).

4. PROGRAM RESOURCES

In order to implement the provisions of statutes, rules, and permit conditions, a regulatory authority must have the resources to do so. Necessary resources include time, money, expertise and personnel. Ideally, the state or province funds the sulfide mining program adequately and ensures that payments and penalties assessed against mine owners and operators go back to the mining program. Such funding or self-funding must be adequate to cover the program's needs in all stages including regulating exploration and prospecting, reviewing permit applications, overseeing ongoing mining operations and reclamation activities, and post-closure monitoring.

1. The state or province provides adequate funding, staffing, external experts and time to agencies responsible for mining regulation programs for thorough review of permit applications, modifications to permit, enforcement activities, and post-closure cleanup activities.
2. The state or province charges a permit application fee commensurate with permitting costs to support its mining regulation programs. States should require a permit application fee that is dedicated to use by the mining regulatory body.
3. The state or province allows civil penalties to be used by the mining regulation program.
4. Financial assurance is required in a form that is safe from creditors and is utilized and available when needed.

A. MICHIGAN

Though Michigan has never regulated a sulfide mine from application through reclamation, its limited experience has nonetheless revealed a significant resources shortfall in the program. The financial assurance mechanisms and other avenues of funding the program and its work (e.g., penalties and application fees) are not written in a way that ensures adequate program support.

Overall grade: Poor

1	The state or province provides adequate funding, staffing, external experts and time to agencies responsible for mining regulation programs for thorough review of permit applications, modifications to permits, enforcement activities and post-closure cleanup activities.	NO
2	The state or province charges a permit application fee commensurate with permitting costs to support its mining regulation programs. States should require a permit application fee that is dedicated to use by the mining regulatory body.	NO
3	The state or province allows civil penalties to be used by the mining regulation program.	NO
4	Financial assurance is required in a form that is safe from creditors and is utilized and available when needed.	SOME

Discussion:

1. The state or province provides adequate funding, staffing, external experts and time to agencies responsible for mining regulation programs for thorough review of permit applications, modifications to permit, enforcement activities, and post-closure cleanup activities.

Michigan's funding mechanisms for regulating sulfide mining are inadequate. The regulation of sulfide mining is funded by application fees (\$5,000 per application) and a per-ton-excavated operating fee (a minimum \$5,000/year through the operational and post-closure phases). A lack of funding has never forced a cutback in staff or resources or led to delays in permitting or other decisions, and DEQ's program director Hal Fitch states that its current 1-1.5 FTE staff working on the program are all that it needs, given that there has been only one application in the last 10 years. Though there are imposed timelines on decision-making in many phases, DEQ has been able to take extensions where needed.

On the other hand, Mr. Fitch has also publicly stated that DEQ's work reviewing, assessing, and processing the Eagle mine application has cost the state approximately \$800,000 and "[w]e'll probably never get all of that back."²³⁴ There have been calls to change the law to increase fees and/or taxes on mines, but so far no concrete action has been taken.²³⁵ Also, there has been a serious challenge issued to the DEQ that its review of the Kennecott project has been inadequate and lacked the necessary expertise, even to the point of alleged fraud. There are numerous instances cited in which DEQ has not fully addressed the citizen groups' concerns and/or failed to enforce its own regulations in the permit and environmental assessment review.

²³⁴ Tina Lam, "Will mines get state's riches for a paltry sum?" *Detroit Free Press*, Nov. 28, 2011.

²³⁵ *Id.*

Whether these failures are the result of poor staffing and a lack of resources and expertise, however, is an open question.

While DEQ and other state agencies have not been asked to monitor and enforce the rules with regard to an ongoing operation, the Eagle mine will soon provide a test. However, compared to the funding systems of other states, and given the apparent shortfall already generated by processing just one application, Michigan's funding of its sulfide mining program is patently inadequate.

2. The state or province charges a permit application fee commensurate with permitting costs to support its mining regulation programs. States should require a permit application fee that is dedicated to use by the mining regulatory body.

The permit application fee is \$5,000 and is therefore nowhere near commensurate with the state's actual costs of reviewing an application. The permit application fee goes into a fund in the state treasury earmarked for the exclusive use of the department to regulate sulfide mining, but this in itself cannot make up for the fundamental shortfall created by the low permit fee.

3. The state or province allows civil penalties to be used by the mining regulation program.

There is no provision for direct allocation of civil penalties to the mining regulation program.

4. Financial assurance is required in a form that is safe from creditors and is utilized and available when needed.

DEQ staff states that the funds would be safe from creditors,²³⁶ but the statute and rules are not so clear. The rules require a permittee to notify DEQ of the commencement of voluntary or involuntary bankruptcy proceedings (R 425.302(17)), but there is no provision in the rules about assurance instruments that requires such instruments be safe from the permittee's creditors in a bankruptcy situation. Allowable forms of financial assurance include: trust fund, escrow account, surety bond, irrevocable letter of credit, COD or time deposit account. Rule 425.301-307. Also, only 75% of the total financial assurance amount must be deposited or accounted for in regular assurance instruments, while the remaining 25% can be covered through a "statement of financial responsibility." R 425.301(3).

While not necessarily safe from creditors, DEQ has nearly unfettered access to the funds. Funds are directly accessible when needed to "curtail or remediate any damage to the environment or public health" or recover "any costs the department has incurred." R 425.302(15). This language is very broadly written, and allows DEQ to draw on assurance monies not only for reclamation activities but also monitoring activities, at any time during the life of the permit or in the post-closure phase. See R 425.302(16) and R 425.301(2). The DEQ can require additions to the funds if necessary.

B. MINNESOTA

Minnesota's funding of sulfide mining regulation is clearly set up to maintain a functioning regulatory system in response to changing workloads, and even in response to

²³⁶ Hal Fitch, Michigan DEQ, Office of Geological Survey (personal communication, July 5, 2011).

potential cleanup operations. However, staffing of the program and time constraints placed on application review may prove a problem in the future if the number of applications increases.

Overall grade: Fair

1	The state or province provides adequate funding, staffing, external experts and time to agencies responsible for mining regulation programs for thorough review of permit applications, modifications to permits, enforcement activities and post-closure cleanup activities.	SOME/ N/A
2	The state or province charges a permit application fee commensurate with permitting costs to support its mining regulation programs. States should require a permit application fee that is dedicated to use by the mining regulatory body.	YES
3	The state or province allows civil penalties to be used by the mining regulation program.	NO
4	Financial assurance is required in a form that is safe from creditors and is utilized and available when needed.	YES

Discussion:

1. The state or province provides adequate funding, staffing, external experts and time to agencies responsible for mining regulation programs for thorough review of permit applications, modifications to permit, enforcement activities, and post-closure cleanup activities.

Minnesota has a number of mechanisms in place to ensure adequate funding is provided, mostly at the direct expense of the regulated parties. The \$50,000 application fee is deposited in an account dedicated to use by the sulfide mining program only. The annual fees (\$75,000) are likewise dedicated to the program. Minn. Stat. 93.482, subd 1(c). Also, the applicant is directly billed DNR’s costs of reviewing the permit application or a variance request and will not be granted a permit until those costs are paid in full. Minn. Stat. 93.482, subd 2. Finally, DNR has authority to charge its monitoring costs through the construction phase (done at its sole discretion) directly to the permittee. Minn. Stat. 93.482, subd 2.

However, program staffing may be a problem if and when applications start coming in. There are 3-4 FTE DNR employees working on the program currently, though no one is working exclusively with the program. DNR has recently lost a couple key senior staff people with expertise in this area and until they hire more they are “moving slowly.”²³⁷ At present there is not a crunch, though this may be because there is only one pending application.

Whether DNR has sufficient time to conduct a thorough review of applications and modification requests is an open question. Recent legislation gives DNR a “goal” of making a permit decision within 30 days of the EIS adequacy determination. This is not a requirement, and the other timing and regulatory requirements may toll the period, for example if an application is contested with cause and an administrative hearing is held. In that case, the objector has 30 days from the date of publication of the application to object; the department will set a hearing date no later than 30 days after the last day to respond; and a determination will be made to grant or deny the permit within 120 days after the hearing. Rule 6132.4000. These time constraints have not yet been applied or tested.

²³⁷ Kim Lapakko, Minnesota DNR, (personal communication with author, August 9, 2011).

2. The state or province charges a permit application fee commensurate with permitting costs to support its mining regulation programs. States should require a permit application fee that is dedicated to use by the mining regulatory body.

The \$50,000 application fee goes into an account dedicated to the sulfide mining program. Minn. Stat. §93.481. The application fee is not necessarily commensurate with the cost of application review.

3. The state or province allows civil penalties to be used by the mining regulation program.

There is no provision for direct allocation of civil penalties to the mining regulation program.

4. Financial assurance is required in a form that is safe from creditors and is utilized and available when needed.

Minnesota plainly requires that financial assurance must “not be dischargeable through bankruptcy” and must “be available and made payable to the commissioner when needed.” R Minn. Rules 6132.1200, subpt 5. DNR may access the funds “when the operator is not in compliance with either the contingency reclamation plan or the corrective action plan” set forth by the department. Minn. Rules 6132.1200, subpt 6.

C. WISCONSIN

Wisconsin’s funding mechanisms have some gaps in coverage. Funding for the application phase is neatly covered by the regulations, and there are no hard deadlines for review of applications or other activities. However, when it comes to monitoring and enforcing the rules on an active mine or mine cleanup, the Department may be left without adequate funding or the ability to hire additional staff. Financial assurance is only partly required to be safe from creditors and there is no guarantee that civil penalties or other fees collected from active mines will return to the mining program.

Overall grade: Fair

1	The state or province provides adequate funding, staffing, external experts and time to agencies responsible for mining regulation programs for thorough review of permit applications, modifications to permits, enforcement activities and post-closure cleanup activities.	SOME
2	The state or province charges a permit application fee commensurate with permitting costs to support its mining regulation programs. States should require a permit application fee that is dedicated to use by the mining regulatory body.	YES
3	The state or province allows civil penalties to be used by the mining regulation program.	NO
4	Financial assurance is required in a form that is safe from creditors and is utilized and available when needed.	SOME

Discussion:

1. The state or province provides adequate funding, staffing, external experts and time to agencies responsible for mining regulation programs for thorough review of permit applications, modifications to permit, enforcement activities, and post-closure cleanup activities.

As in Minnesota, permit fees are calculated by the state's actual costs in reviewing the project, including any outside consultants hired by the department. Wis. Stat. § 293.32. The base application fee is \$10,000, which will be trued up or down depending on the department's costs of reviewing the application. NR 132.06(3)(a). The EIS fee goes back to the general fund, but the permit application fee goes to a program revenue account that DNR has control over. There are interim deadlines for departmental decision-making, but no general limit on the whole process. DNR staff state that they would tell an applicant that the process would take 3-5 years, but the Crandon mine application process took 10 years before it was abandoned.²³⁸

While funding of the state's review of a permit application is well-covered, funding of enforcement, monitoring and post-closure activities is not well-established in the law. There are a number of associated funds that "tax" a mine's waste, e.g. the Environmental Fund and the Groundwater Fund, but these monies do not go directly back to the mining program or its activities.²³⁹

2. The state or province charges a permit application fee commensurate with permitting costs to support its mining regulation programs. States should require a permit application fee that is dedicated to use by the mining regulatory body.

Permit application fees are based on department's actual costs in reviewing the project. Wis. Stat. § 293.32; NR 132.06(3)(a). The EIS fee goes back to the general fund, but the regulatory fee goes to a program revenue account that DNR has control over.

3. The state or province allows civil penalties to be used by the mining regulation program.

Civil penalties would go into a general fund, not directly back to the mining program.

4. Financial assurance is required in a form that is safe from creditors and is utilized and available when needed.

Only half of Wisconsin's financial assurance requirements are safe from creditors. Wisconsin requires two types of financial assurance: the irrevocable trust fund and the reclamation bond. The irrevocable trust fund monies would be safe from creditors, and DNR controls the fund as the sole beneficiary and is the only entity authorized to withdraw funds from the trust. NR 132.085(3). The reclamation bond, on the other hand, is not required to be in a form safe from creditors, nor must the permittee notify the department if it is going into bankruptcy. The reclamation bond must be posted by licensed surety company, but cash, certificates of deposit, or government bonds are alternatives to the reclamation surety bond. Wis. Stat. § 293.51, NR 132.09(2).

D. ONTARIO

²³⁸ Larry Lynch, *supra* note 31.

²³⁹ For more information, see Thomas Evans, "An Overview of Metallic Mineral Regulation in Wisconsin." (3rd Ed.) Wisconsin Geological and Natural History Survey, Special Report 13, 2004, (Madison, WI), at 57.

Ministries with oversight of mining do not have adequate resources to perform responsibilities. Permit application fees are not dedicated to use by the mining regulatory body and although civil penalties are available in Ontario, they do not exist within the *Mining Act*. Financial assurance can be provided in forms that are safe from creditors, though this is not a requirement for all of the mines.

Overall Grade: Poor

1	The state or province provides adequate funding, staffing, external experts and time to agencies responsible for mining regulation programs for thorough review of permit applications, modifications to permits, enforcement activities and post-closure cleanup activities.	NO
2	The state or province charges a permit application fee commensurate with permitting costs to support its mining regulation programs. States should require a permit application fee that is dedicated to use by the mining regulatory body.	NO
3	The state or province allows civil penalties to be used by the mining regulation program.	NO
4	Financial assurance is required in a form that is safe from creditors and is utilized and available when needed.	SOME

Discussion:

1. The state or province provides adequate funding, staffing, external experts and time to agencies responsible for mining regulation programs for thorough review of permit applications, modifications to permits, enforcement activities, and post-closure cleanup activities.

Revenues for the Ministry of Northern Development, Mines and Forests come from royalties (including annual rent for leasing public land), taxation (the mining land tax, also known as an acreage tax), and fees (application fee, assessment work fee, etc.). In 2010-11, the majority of the revenues were from royalties (79%), with much less revenue from taxation and fees (both at 7%).²⁴⁰ Penalties only arise from the forfeiture of mining rights. These revenues do not cover the costs of the Ministry’s programs, so the provincial budget allocates additional resources from general revenues.

In 2005, the Auditor General for Ontario audited the Mines and Minerals Program. At the time, there were significant concerns about the closure plans:

The Ministry does not periodically review whether the closure-cost estimates and financial assurances are still sufficient to properly close out the mine. For example, the costs originally estimated in the closure plan for one mine were \$551,000 in 1993. The plan was not filed because the owner could not provide financial assurance. Nevertheless, the mine owner significantly underestimated closure costs. Since the mine is no longer operational and the company is not able to pay closure costs, the Ministry may ultimately be responsible for rehabilitating this site, at a cost that is now estimated to be \$9 million.²⁴¹

²⁴⁰ Ministry of Finance, Public Accounts of Ontario, 2010-11, pages 1-16 to 1-17. <http://www.fin.gov.on.ca/en/budget/paccts/2011/11vol1eng.pdf>.

²⁴¹ Auditor General of Ontario, Annual Report, 2005, page 183. http://www.auditor.on.ca/en/reports_en/en05/309en05.pdf

When the Auditor General followed up this report in 2007, some of the 18 outstanding closure plans had been submitted and the Ministry indicated it would continue to pursue outstanding closure plans.²⁴² At that time, the Ministry had not established a regular review process to determine if closure-cost estimates and financial assurances were sufficient to properly close out a mine.²⁴³

The Ministries of the Environment and Natural Resources are also under-resourced. In 2007, the Environmental Commissioner of Ontario reported that these two “key environmental Ministries have not been allocated financial resources in accordance with the growth in the overall operating budget of the Ontario Government.”²⁴⁴ The Commissioner’s most recent Annual Report stresses that these Ministries do not have the resources to undertake core activities.²⁴⁵

2. The state or province charges a permit application fee commensurate with permitting costs to support its mining regulation programs. States should require a permit application fee that is dedicated to use by the mining regulatory body.

The Ministry of Northern Development and Mines can establish fees (including an application fee) and rents.²⁴⁶ As mentioned above, these revenues are a very small share of the Ministry’s revenues and are not sufficient to support the mining program, nor are they even dedicated to use for mining regulation.

3. The state or province allows civil penalties to be used by the mining regulation program.

There are no civil penalties under Ontario’s *Mining Act*, but in 2005, civil penalties were enabled under Ontario’s *Environmental Protection Act* and *Ontario Water Resources Act*. These “environmental penalties” can apply to metal mining operations and can be assessed immediately when there are spills.²⁴⁷ Environmental penalties are deposited in the Ontario Community Environmental Fund to fund projects in the watersheds where violations have occurred.²⁴⁸ The money is not, therefore, directly returned to fund the mining regulation program. A number of

²⁴² Auditor General of Ontario, Annual Report, 2007, page 393

http://www.auditor.on.ca/en/reports_en/en07/409en07.pdf

²⁴³ Auditor General of Ontario, Annual Report, 2007, page 393

http://www.auditor.on.ca/en/reports_en/en07/409en07.pdf

²⁴⁴ Environmental Commissioner of Ontario. 2007. *Doing Less with Less: How shortfalls in budget, staffing and in-house expertise are hampering the effectiveness of MOE and MNR, ECO Special Report, 2007*. Toronto, ON : Environmental Commissioner of Ontario. http://www.ecoissues.ca/index.php/Doing_Less_with_Less

²⁴⁵ Environmental Commissioner of Ontario. 2011. “Less and Less: Budgets for MOE and MNR not Meeting Needs”, *Engaging Solutions: Annual Report 2010/11*. Toronto, ON : Environmental Commissioner of Ontario. pages 80-85.

http://www.ecoissues.ca/index.php/Less_and_Less:_Budgets_for_MOE_and_MNR_not_Meeting_Needs

²⁴⁶ *Mining Act*, R.S.O. 1990, c. M.14, sections 41, 81, 82, 83, 177.1. The prescribed rents are established in the *General Regulations*, O. Reg. 45/11.

²⁴⁷ Links to the legislation, guidance documents, and annual reports regarding environmental penalties is available on-line:

http://www.ene.gov.on.ca/environment/en/industry/compliance_and_enforcement/environmental_penalties/index.htm

²⁴⁸ For more information see Ontario Community Environment Fund on-line:

http://www.ene.gov.on.ca/environment/en/funding/community_environment_fund/index.htm

metal mining operations have been assessed penalties. For example, in 2010 six mines (two of which are in the Lake Superior watershed) were assessed penalties totaling \$81,299.05.²⁴⁹

4. Financial assurance is required in a form that is safe from creditors and is utilized and available when needed.

Financial assurance is required as part of the closure plan.²⁵⁰ The proponent of the mine must certify that the financial assurance is adequate.²⁵¹ Permitted forms of financial assurance are: cash, letter of credit, bonds, reclamation trust fund, and compliance with a corporate financial test.²⁵² There are different requirements for meeting the corporate financial test, depending on whether it is to be used for all or only half of the life of the mining project.²⁵³ Subsection 145(5) of the *Mining Act* states that the security can be utilized when it is needed to ensure that rehabilitation measures are performed. Also, subsection 145(8) of the *Mining Act* states that the funds intended for financial assurance are to be paid into a special purpose account and that disbursements from the account can be made by the Minister of Finance. According to an official from the Ministry of Northern Development and Mines, cash, letters of credit, and surety bonds have been collected for 143 of the 156 filed closure plans.²⁵⁴

²⁴⁹ Ministry of the Environment. 2010 Environmental Penalty Annual Report. Publication PIBS 8154e, Queen's Printer for Ontario, 2011. Available on-line:

http://www.ene.gov.on.ca/stdprodconsume/groups/lr/@ene/@resources/documents/resource/stdprod_084242.pdf.

²⁵⁰ *Mining Act*, R.S.O. 1990, c. M.14, Part VII.

²⁵¹ *Mine Development and Closure Under Part VII of the Act*, O. Reg. 240/00, section 12.

²⁵² *Mining Act*, R.S.O. 1990, c. M.14, subsection 145(1).

²⁵³ *Mine Development and Closure Under Part VII of the Act*, O. Reg. 240/00, sections 16 and 17.

²⁵⁴ Personal communication with Laura Blondeau, Communications Director, Office of the Minister of Northern Development, Mines and Forestry (e-mail dated November 10, 2011).

5. REPORTING AND OFFICIAL STATEMENTS

An ideal sulfide mining regulatory program requires the highest quality data from permittees so decisions and actions are based in fact, not simply on a permittee's assurances. Not only must the permittee be accountable to the regulators, but the regulators must be accountable to the public whose safety and resources they are charged to protect. In order to assess these factors, the following criteria were considered:

1. The state or province provides and/or requires accurate, adequate and truthful legally-required reports informed by statistically appropriate, high-quality data.
2. All monitoring reports, and the raw data that informs them, are available to the public in easily accessible (electronic) formats before, during and after mining.

For information on water quality monitoring and reporting, see the Water Quality Report, at Appendix A.

A. MICHIGAN

While Michigan's law requires public access to monitoring reports and underlying data, it fails to provide any standards for regulatory review of those reports, nor have such standards been developed at the agency level. Though there is not much of a track record for evaluating the rigor of the state's review, the state's technical review of the Kennecott project has been met with severe criticism, both internal and external. For that reason, Michigan is only fulfilling some of the criteria for reporting and official statements.

Overall grade: Poor

1	The state or province provides and/or requires accurate, adequate and truthful legally-required reports informed by statistically appropriate, high-quality data.	NO
2	All monitoring reports, and the raw data that informs them, are available to the public in easily accessible (electronic) formats before, during and after mining.	SOME

Discussion:

1. The state or province provides and/or requires accurate, adequate and truthful legally-required reports informed by statistically appropriate, high-quality data.

Though the state has little experience in assessing or creating reports yet, it has been sharply criticized for its assessments so far in the Kennecott project and there is a definite lack of regulatory standards in this area. For these reasons, Michigan does not meet the criterion. There are no specific standards for accuracy, integrity, or review in the sulfide mining statute or rules, and DEQ has no set policy for evaluating the veracity and accuracy of an applicant or permittee's data submissions. The state does not conduct routine quantitative measurements of mine conditions on its own, and though it has the authority to conduct ad hoc sampling, DEQ staff states that in practice, this would be mostly visual inspection. All the parameters for sampling and monitoring are set on a case-by-case basis, and while the parameters for monitoring water quality are set in Rules (R 425.406), they are designed specifically for each site and set in a monitoring plan approved by the department prior to commencement.

As already noted, DEQ has no experience yet with a mine in operation under the current legal regime. However, data submissions from the proposed Kennecott Eagle project have come under severe scrutiny by both independent citizen and environmental groups and by consulting staff hired by DEQ.²⁵⁵ So far these shortcomings have not resulted in any negative permitting decisions or operational delays to the project.

2. All monitoring reports, and the raw data that informs them, are available to the public in easily accessible (electronic) formats before, during and after mining.

Staff reports that all monitoring reports are posted on the DEQ's website and all field inspections and so on would also be available, but there is no requirement as such. The raw data sets underlying both departmental and permittee reports are available to the public, as there is no automatic confidentiality for any monitoring report or underlying datasets. Before mining at the Eagle Mine, portions of the application were difficult to obtain.

²⁵⁵ See DEQ record of permit review, *supra* note 41.

B. MINNESOTA

Minnesota’s requirements for permittee and state-produced reports are minimal, at best. On the other hand, the state provides total access to public scrutiny, meriting a mixed result of meeting “some” of the criteria.

Overall score: Poor

1	The state or province provides and/or requires accurate, adequate and truthful legally-required reports informed by statistically appropriate, high-quality data.	NO
2	All monitoring reports, and the raw data that informs them, are available to the public in easily accessible (electronic) formats before, during and after mining.	SOME

Discussion:

1. The state or province provides and/or requires accurate, adequate and truthful legally-required reports informed by statistically appropriate, high-quality data.

Until Minnesota actually reviews an entire permit application and has experience monitoring an active mine, it is difficult to say how precise its reporting requirements and review will be. However, the basic reporting framework does not specify standards for accuracy, validation, or verification of a permittee’s submissions. The permittee’s annual report to DNR is not intended to be a highly technical reporting device and does not require reporting of water quality monitoring or other operational indicators. Water quality reports are sent separately to the PCA as part of the permittee’s NPDES/SDS permit. The permittee submits the results of testing monthly, and these are reviewed by PCA staff “at least semi-annually.” The PCA may conduct independent verification monitoring “on a limited basis”, but verification is neither required nor part of the regular enforcement/monitoring program.²⁵⁶ Given this basic structure, Minnesota certainly does not “require” (as a matter of policy) accurate, adequate or truthful reporting.

2. All monitoring reports, and the raw data that informs them, are available to the public in easily accessible (electronic) formats before, during and after mining.

The annual reports are available to the public, including post-closure reports. The department prefers to send all documents in electronic format. Future methods of handling of monitoring reports are unknown, but web posting is not required.

C. WISCONSIN

Though lacking in practical experience with active sulfide mining operations, Wisconsin has safeguards and standards already in place to ensure high-quality monitoring and reporting. It also ensures complete public access to reports and underlying data in all phases of an operation.

Overall score: Good

1	The state or province provides and/or requires accurate, adequate and truthful legally-required reports informed by statistically appropriate, high-quality data.	YES
2	All monitoring reports, and the raw data that informs them, are available to the public in easily accessible (electronic) formats before, during and after mining.	YES

²⁵⁶ Ann Foss, *supra* note 27.

Discussion:

1. The state or province provides and/or requires accurate, adequate and truthful legally-required reports informed by statistically appropriate, high-quality data.

Wisconsin has a reasonably well-established concept of how it intends to require and verify accurate reporting from sulfide mines. The methods and measurements required in reporting documents will be set forth in the Notice of Intent document created in the application phase of a proposed mine. All measurements and samples must be analyzed by a state-licensed lab, and the state will oversee the permittee’s monitoring activities about 80% of the time.²⁵⁷ Further, regulators gather split samples²⁵⁸ at least once a year on groundwater monitoring and conduct ad hoc split sampling of air filters. These requirements and verification methods are as yet untested on an operating mine, yet their existence indicates that Wisconsin is at least mindful of the need for such safeguards.

2. All monitoring reports, and the raw data that informs them, are available to the public in easily accessible (electronic) formats before, during and after mining.

All monitoring reports are available to the public and would likely be posted on the DNR website and fee-free even for special requests. This includes all raw data underlying self-monitoring reports and department reports.

D. ONTARIO

Information required by both the federal and the provincial governments is of high quality, but public access to the information is almost nonexistent. In some instances, the mine proponents are required to make information public, but access is limited because the public must appear in person at the business office during regular business hours. Federally, litigation was necessary to ensure that pollution from tailings ponds and waste rock must be reported to the National Pollutants Release Inventory. Yet even with a Court order, reporting is not complete or easily accessible. Provincially, there has been improvement in public accessibility to some datasets, but the availability of information relevant to mining is subject to extensive lags.²⁵⁹

Overall grade: Fair

1.	The state or province provides and/or requires accurate, adequate and truthful legally-required reports informed by statistically appropriate, high-quality data.	YES
2.	All monitoring reports, and the raw data that informs them, are available to the public in easily accessible (electronic) formats before, during and after mining.	SOME

Discussion:

1. The state or province provides and/or requires accurate, adequate and truthful legally-required reports informed by statistically appropriate, high-quality data.

Most of the reporting requirements under the various applicable Acts and regulations specify at least some type of technical format and/or assurance of accuracy. For instance, closure

²⁵⁷ Larry Lynch, *supra* note 31.

²⁵⁸ Split sampling involves two or more entities gathering samples simultaneously, but sending them to different labs for analysis. Outcomes are then compared to ensure quality control and calibration.

²⁵⁹ Datasets are available for 2004-2009 only.

plans must be submitted in accordance with prescribed reporting requirements, which are set out in Schedule 2 of the *Mine Development and Closure Regulation*.²⁶⁰ The closure plan must contain a certificate attesting to the truth of the information therein and that the plan is full, true, and plain disclosure of the rehabilitation work required to restore the site.²⁶¹ A progressive rehabilitation report must be submitted within 60 days of completing rehabilitation work,²⁶² including the contents specified in section 9 of the *Mine Development and Closure Regulation*.

Under the federal *Fisheries Act*, testing results must be recorded (as must the volume of effluent discharged from each final discharge point) and summarized in an annual report.²⁶³ Reporting requirements set out in the *Metal Mining Effluent Regulations* include reporting on the monthly mean concentration and calculations regarding the loading of substances deleterious to fish. Monitoring results are reported quarterly and all of the tests and monitoring conducted during that quarter must be included. Monitoring studies must be done using documented and validated methods, and interpreted and reported in accordance with generally accepted standards of good scientific practice.²⁶⁴ The owner or operator of a mine must keep records relating to effluent monitoring equipment, including manufacturer's specifications and year and model number, and the results of calibration tests of the equipment.²⁶⁵

Also, under Ontario's *Environmental Protection Act*, a mining operation must keep records of all sampling and analytical procedures, monitoring, calculations, maintenance/calibration procedures, retention times, problems/malfunctions, incidents, process changes, locations of sampling points, etc.²⁶⁶ Records must be made as soon as reasonably possible and retained for three years in an electronic form acceptable to the Director of the Ministry of the Environment. Section 38 of the *Effluent Monitoring and Effluent Limits – Metal Mining Sector Regulation* requires that quarterly reports be submitted to the Director of the Ministry of the Environment and section 39 requires semi-annual chronic toxicity tests reporting. Further, under Ontario's *Environmental Protection Act* metal and non-metal mining operations are subject to the *Airborne Contaminant Discharge Monitoring and Reporting Regulation*, which requires facilities to report emissions exceeding a threshold set out in Tables 2A and 2B of the Ministry of the Environment publication entitled "Step by Step Guideline for Emission Calculation, Record Keeping and Reporting for Airborne Contaminant Discharge."²⁶⁷

2. All monitoring reports, and the raw data that informs them, are available to the public in easily accessible (electronic) formats before, during and after mining.

Although information is often required to be submitted to the government in an electronic format, generally reports are not easily accessible by the public. In some cases, the information that is required to be made public is only done so during regular business hours at the office of the proponent. The raw data is generally not made public at all. And, use of the freedom of information legislation federally and provincially is costly and often requires undergoing dispute resolution with the proponent who challenges the release of information on proprietary grounds.

²⁶⁰ *Mine Development and Closure Under Part VII of the Act*, O. Reg. 240/00, Schedule 1.

²⁶¹ *Mine Development and Closure Under Part VII of the Act*, O. Reg. 240/00, subsection 12(2).

²⁶² *Mining Act*, R.S.O. 1990, c. M.14, subsection 139.1(2).

²⁶³ *Metal Mining Effluent Regulations*, SOR/2002-222, ss. 17-26, Schedule 5, available on-line: <http://laws.justice.gc.ca/eng/regulations/SOR-2002-222/>.

²⁶⁴ *Metal Mining Effluent Regulations*, SOR/2002-222, subsection 7(3).

²⁶⁵ *Metal Mining Effluent Regulations*, SOR/2002-222, section 11.

²⁶⁶ *Effluent Monitoring and Effluent Limits – Metal Mining Sector*, O. Reg. 560/94, Part VIII, sections 34-39.

²⁶⁷ *Airborne Contaminant Discharge Monitoring and Reporting*, O. Reg. 127/01.

Reports under sections 7, 21, and 22 of the federal *Metal Mining Effluent Regulations* must be submitted electronically if Environment Canada has provided an electronic format.²⁶⁸ The owner of the mine has to keep all records, books of account, or other documents required by the regulations at the mine's location for no less than 5 years beginning on the day they are made.²⁶⁹ The summary reports required to be prepared annually summarizing a range of data must be made available to the public on request at the metal mining plant during normal office hours (emphasis added).²⁷⁰

There is an electronic federal National Pollutant Release Inventory²⁷¹ established under the Canadian Environmental Protection Act that, as a result of litigation (*Great Lakes United v. Canada (Environment)*, 2009 FC 408 (CanLII)²⁷²), now requires reporting of pollution related to tailings ponds and waste rock dumps. Responding to the Court order to submit information regarding these releases for 2006-2009, the first information of this type was submitted to Environment Canada in 2010. However, according to Environment Canada, not all of the metal mines that are now required to report to them actually provided data.²⁷³

Provincially, where monitoring is required under section 3 and 4 of the *Airborne Contaminant Discharge Monitoring and Reporting Regulation* (as it is for a number of contaminants from mining operations), an annual report must be prepared and made available for examination by any person, free of charge, either by posting it to the internet or by making it available during regular business hours at the facility or the owner's/operator's business office.²⁷⁴

Ontario's Ministry of the Environment has committed to making data more publicly accessible. For example, the datasets for reporting under the Municipal/Industrial Strategy for Abatement are available for the years 2004-2009. And, the Ministry's website states: "Data available here for download has been extracted from the MOE GIS portal, an interactive web-based GIS application that will soon be available for the public to explore these data and create maps through a place-based format."²⁷⁵ Progress toward making the information freely available has been slow.

²⁶⁸ *Metal Mining Effluent Regulations*, SOR/2002-222, section 23.

²⁶⁹ *Metal Mining Effluent Regulations*, SOR/2002-222, section 27.

²⁷⁰ *Effluent Monitoring and Effluent Limits – Metal Mining Sector*, O. Reg. 560/94, section 35.

²⁷¹ National Pollutant Release Inventory – Environment Canada.

<http://www.ec.gc.ca/inrp-npri/default.asp?lang=En&n=4A577BB9-1>.

²⁷² Available on-line: <http://www.canlii.org/en/ca/fct/doc/2009/2009fc408/2009fc408.html>.

²⁷³ See media release *Incomplete reporting still reveals mining companies' toxic threat*, August 10, 2010.

<http://www.ecojustice.ca/media-centre/press-releases/mining-companies-toxic-threat>.

²⁷⁴ *Airborne Contaminant Discharge Monitoring and Reporting*, O. Reg. 127/01, sections 6-13.

²⁷⁵ Data Downloads – Ministry of the Environment.

http://www.ene.gov.on.ca/environment/en/resources/collection/data_downloads/index.htm.

PART III: RECOMMENDATIONS

A. Recommendations for Michigan, Wisconsin and Minnesota:

1. There should be a formal, standard method set forth in the law to coordinate the efforts of the various agencies responsible for different aspects of permitting, monitoring, and enforcement of a mining project.
2. State-conducted independent monitoring should be conducted regularly and systematically at any active mine and reclamation site, including in the post-closure phase, and should be funded by the permittee. Leaving this essential task to the permittee is unacceptable. DEQ should be required, not just empowered, to take immediate action to stop and/or remediate any problem found.
3. Affected tribes should be empowered to participate in permit decisions and monitoring.
4. Mine plans should include non-environmental goals and standards such as workers' safety, long-term viability of the mine (prohibiting high-grading), economic plans for communities' long-term health, reasonable royalties, past performance of applicant and community priorities as expressed in Master Plans, zoning, etc.
5. Public funds must not be committed to financing or assisting any project that has not completed and passed environmental review. This should be a matter of law with no exceptions.
6. Civil penalties and fees assessed for noncompliance should be dedicated to return to the nonferrous metallic mining program.

B. Michigan-specific recommendations:

1. Exploratory activities should be regulated.
2. Environmental Assessment should not be done by the applicant but by the state, and should be funded by the applicant.
3. The lack of siting criteria is a major shortcoming in Michigan's application process. Areas of special sensitivity such as wetlands, waterways, and land protected by state or federal designations should be considered unsuitable for mining activities or at least be subject to heightened review. Setbacks and buffers between mining activities and public rights of way, structures, and so on should be systematized and standard.
4. Michigan's highly protective remediation goal must be supported by objective, technical standards for permit applications and reclamation plans. An applicant must be able to demonstrate that its proposed mining and reclamation activities meet the standards and adhere at a minimum to the best industry practices available. For instance, the law provides no specifics for how to achieve structural integrity or a minimum level of safety in a mine.
5. The law should require the state to address each and every potential impact identified in the EA and approve an application only when it positively determines that all of the

application standards set forth in the rules are met. Technical requirements and minimum standards for data should be clear and mandatory. Setting standards is meaningless unless the agency is bound to enforce them.

6. The financial assurance mechanism should be redrafted to ensure that funds are safe from creditors and the permittee has committed 100% of the projected costs to financial assurance instead of only 75%.
7. The state should improve its integration of and responsiveness to public concerns and questions regarding permit applications, regardless of whether the citizen(s) are directly affected by the proposal. All citizens have a recognized interest in and right to preserving the state's resources.
8. Funding of the mining program must be improved. Permit application fees should be raised to a higher set price or, ideally, should be based directly on the state's costs of reviewing the application and completing an independent environmental assessment. Once permitted, the permittee should be directly responsible for funding the state's monitoring and enforcement activities.
9. Citizens should be allowed to initiate immediate civil enforcement actions where the state is not taking sufficient action.

C. Minnesota-specific recommendations:

1. Exploratory activities should be regulated in all circumstances, not just on government-owned or -leased land.
2. Environmental Assessment should not be done by the applicant but by the state, and funded by the applicant.
3. The goal of reclamation should be to return the area to environmental functionality, not to find a balance with economic development or simply "do one's best."
4. The permittee should be required to comply with all applicable state and federal standards, and violation of any should be grounds for permit revocation until the violation or deficiency is corrected.
5. The law should require the state to address each and every potential impact identified in the EA and approve an application only when it positively determines that all of the application standards set forth in the rules are met. Setting standards is meaningless unless the agency is bound to enforce them.
6. The state should improve its integration of and responsiveness to public concerns and questions regarding permit applications, regardless of whether the citizen(s) are directly affected by the proposal. All citizens have a recognized interest in and right to preserving the state's resources.
7. Citizens should be allowed to participate in permitting decisions and state enforcement actions regardless of whether their property rights are immediately affected by the issue.

The public should also be empowered to initiate immediate civil enforcement actions where the state is not taking sufficient action.

8. The state must provide DNR with adequate staff and time to make fair and fully informed decisions on permit applications, monitoring and enforcement actions.

D. Wisconsin-specific recommendations:

1. Certain of the standards for mine construction and reclamation could use additional technical detail, as noted in the assessment section. For instance, structural stability and subsidence are considered but no technical requirements are laid out in the regulations (as they are in Minnesota).
2. Funding for monitoring and enforcement activities should be as comprehensive as that provided for application review. In other words, the permittee should be responsible in some way for the state's costs of monitoring and enforcing the law.

E. Ontario-specific recommendations:

1. A permitting program for mining should be established. The permitting program should include the ability to review permits and amend or revoke a mining permit in situations of noncompliance with the permit conditions.
2. Strategic environmental assessment of mining should be conducted in Ontario, with a goal to promote sustainability. All subsequent individual mines that are assessed should be subject to the criteria/recommendations associated with the strategic environmental assessment.
3. Exemption for mining from environmental assessment should be discontinued and full, comprehensive, coordinated environmental assessment of all aspects new/expanding mines should be required.
4. The federal environmental assessment standard should be changed from no significant adverse effects (after mitigation) to promotes/further sustainability. The provincial standard ("betterment of the people" of Ontario) should be applied as promoting/furthering sustainability (rather than minimizing impacts).
5. The regulation permitting the use of natural water bodies as tailings impoundment areas should be revoked.
6. Anticipated new plans/permits associated with advanced exploration should be consistent with the purpose enabling the recent amendments to the *Mining Act*.
7. Fiscal tools applied to mining in Ontario should be fully audited; financial assurance that is sufficient to rehabilitate mined lands/waters should be required and subsidies/tax holidays should only be employed to promote/further sustainability.
8. Public notice of advanced mining exploration should be required.

9. Anticipated new regulations regarding First Nation engagement in the mining program should be consistent with the constitutional protection for Aboriginal and Treaty Rights.
10. Adequate support to First Nations in order to ensure meaningful consultations, consistent with the constitutional protection for Aboriginal and Treaty Rights, should be provided.
11. Information, including technical background documents, reports submitted regarding monitoring and compliance, and enforcement data, should be publicly available and accessible.
12. Proponent-provided information and data should be supplemented with that collected by government. A process for addressing inconsistencies should be established.
13. Mining program enforcement policies should be publicly available.
14. Funding that supports public participation and access to justice should be provided by government.
15. The citizen appeal process for instruments relating to mining should be consistent with the purpose of the *Environmental Bill of Rights*.
16. Civil penalties for noncompliance with the *Mining Act* should be established and any funds received should be dedicated to the mining program.

APPENDIX A: Water Quality Regulation Report: Michigan, Minnesota, and Wisconsin



Clean Water Act Oversight of Sulfide Mining in Michigan, Minnesota and Wisconsin

OVERVIEW/EXECUTIVE SUMMARY

The Clean Water Act gives states a great deal of authority to establish water quality standards and permitting programs that regulate activities to protect the uses of the waters.

In order to better understand how Michigan, Wisconsin and Minnesota apply the Clean Water Act to proposed sulfide mining operations, River Network interviewed staff from all three states.

Background

Michigan

In Michigan, all environmental permits (air, water, solid waste) must be obtained before sulfide mining can proceed. There are no special Clean Water Act (CWA) exemptions for non-ferrous metallic mining. Laws and regulations for mining²⁷⁶ are meant to supplement other required permits to fill the gaps. When a mining proposal is submitted, an application review team is established that comprises staff from many state departments (e.g., fisheries, wildlife, water, air, solid waste, and wetlands) to identify what gaps need to be filled.

There is one recently-permitted sulfide mine located in Michigan's Upper Peninsula, Rio Tinto's Eagle Mine. The mining operation is located along and beneath the Salmon Trout River and the processing facility is offsite at a former gold mine processing facility.

Orvana's Copperwood mine application is also under review, and HudBay is expected to submit applications for a mine along the Michigan-Wisconsin border in 2012.

Minnesota

There are currently no active sulfide mines in Minnesota. One project by Polymet Mining, Inc. has begun the process to obtain the necessary legal authority and permits to operate a sulfide mine. Minnesota requires that potential mining activities must obtain federal and state Environmental Impact Statements (EIS) before proceeding with any of the permitting that the Clean Water Act requires. In the case of the Polymet project, there are two federal EIS procedures (the Forest Service and the Army Corps of Engineers) and one state EIS procedure being carried out in a somewhat coordinated fashion. No Clean Water Act permit applications

²⁷⁶ Part 632 of Michigan's Natural Resources and Environmental Protection Act, MCL section 324.63201 to 324.63223 and R425.101 to 425.602

have been submitted yet. The data generated during the EIS proceedings will be used in the various necessary permit applications when the time comes. There is a long list of environmental permits that will be required covering water, air and wetland impacts. It is expected that the project will get past the EIS stage. When the permit evaluation begins, the Minnesota Pollution Control Agency (MPCA) will need to coordinate with the Department of Natural Resources because they are in charge of mining and water appropriation. The MPCA is largely monitoring the EIS process at this point, which is supposed to be completed by January 2012.

- **Wisconsin**

In Wisconsin, there are no active sulfide mines. The Flambeau mine was a sulfide mine and it operated for about five years and closed in 1998.²⁷⁷ The Crandon mine application came in around 1994²⁷⁸ (for the second time) and the staff in the Division of Natural Resources worked on it until 2003 when it was withdrawn.²⁷⁹ There is a pending lawsuit on the Flambeau reclamation.

An amendment to the mining law passed in 1997 that requires all proposed mines must identify a sulfide mine that has been active for 10 years and is not harming the environment, as well as one that has been closed for 10 years and reclaimed without environmental violations.²⁸⁰

Exploration is going on in Wisconsin, although no sulfide mining applications have been submitted to the department.²⁸¹ The Division of Water Quality (DWQ) staff that had been involved in the Clean Water Act (CWA) oversight of the Flambeau mine or in the application process for the Crandon mine have been shifted to other jobs.²⁸² Therefore, all the information provided by DWQ staff was provided “according to existing laws and regulations” to the best of their ability without an ongoing project to reference.

Generally, after the Notice of Intent to mine and the description of the mining plan are filed with the state, the CWA process is triggered. The exact sequencing is different for every mine, however.

I. CLEAN WATER ACT OVERSIGHT

Water Quality Standards

The Clean Water Act requires states to designate uses for every water body in the state, develop water quality criteria that are protective of those designated uses and to apply the antidegradation policy to all activities in order to protect existing uses, high quality waters and outstanding

²⁷⁷ Paul Luebke, Wastewater Engineer; Jim Bertolacini, Storm Water Program Coordinator

²⁷⁸ Larry Lynch, Hydrogeologist, Bureau of Drinking Water and Groundwater, formerly in mining.

²⁷⁹ The application was withdrawn when the mine site was purchased in 2003 by the Sokaogon Ojibwe and Forest County Potawatomi.

²⁸⁰ Wisc. Stat. §293.50(2)

²⁸¹ Larry Lynch, Amanda Minks, Water Quality Standards specialist.

²⁸² Larry Lynch.

national resource waters.²⁸³ A process is required for evaluation of the alternatives and the socio-economic impacts of allowing or not allowing discharges in high quality waters is required.²⁸⁴

Triennial Review

Federal regulations require that each state and tribe review and update water quality standards every three years. The procedure for this review varies from state to state, and many states do not accomplish the review every three years.²⁸⁵

Tribal Water Quality Standards

Tribal governments can apply for “Treatment as State” (TAS) and then develop their own water quality standards.²⁸⁶

National Pollutant Discharge Elimination System Permits (NPDES)

NPDES permits are required for all “point source” discharges – those which come from discrete sources, such as a pipe or a ditch.²⁸⁷

NPDES permit effluent limitations are developed for wastewater discharges based on (a) technology-based standards written for particular industries or (b) water-quality-based standards based on the “reasonable potential” that a proposed discharge will violate water quality standards (or an existing Total Maximum Daily Load allocation).²⁸⁸

- **Wastewater**

The wastewater discharged from municipal sewage treatment plant and industrial facilities requires a NPDES permit.

Wastewater permittees must submit monthly compliance reporting (Discharge Monitoring Reports (DMRs)) to DWQ to report their monitoring results.

- **Storm Water**

The storm water that is collected into a discrete conveyance such as a municipal storm sewer system or a ditch by a construction site requires a NPDES permit if the community is regulated under the program. NPDES construction storm water permits are required where land disturbance is greater than one acre, or part of a common plan that is greater than one

²⁸³ 40CFR131

²⁸⁴ 40CFR131.12

²⁸⁵ 40CFR131

²⁸⁶ CWA Section 518

²⁸⁷ Point source: any discernible, confined and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, or vessel or other floating craft, from which pollutants are or may be discharged. This term does not include agricultural storm water discharges and return flows from irrigated agriculture. CWA Section 502(14)

²⁸⁸ 40CFR401.12; 40CFR122.44(d)(1)(i)

acre. Industrial storm water permits are required for a specific list of activities. This requirement is often addressed within individual wastewater NPDES permits.

Section 404

Section 404 of the Clean Water Act requires permits for all dredge and fill activities that discharge into waters of the United States. This applies to Minnesota and Wisconsin, but only to the Great Lakes drainages in Michigan. Michigan and New Jersey are the only two states that have assumed part of the responsibility of the 404 program from the U.S. Army Corps of Engineers. In waters not connected to the Great Lakes in Michigan, the state Inland Lakes and Streams statute applies rather than Clean Water Act Section 404 and MDEQ reviews and grants wetland permits.²⁸⁹

Section 401

Section 401 of the Clean Water Act allows states (and Tribes) the privilege of reviewing all federal permits and licenses for compliance with state and tribal water quality standards.

Section 303(d) List

Section 303(d) of the Clean Water Act requires states to compile a list of threatened and impaired waters. This is part of an Integrated Report that is due to EPA in April of even years.

Total Maximum Daily Loads (TMDLs)

TMDLs are the allowable amounts of any given pollutant that can be discharged to a water body without causing impairment. These limits are divided among sources and usually require reductions of current loading. This term is now also used to represent the document that summarizes the assessment, analysis, allocation and sometimes implementation elements.

II. STATE SUMMARIES

A. Clean Water Act Oversight of Sulfide Mining in Michigan²⁹⁰

Water Quality Standards (WQS)

Michigan has developed water quality criteria to protect designated uses in its waters. The state considers changes to water quality standards in its triennial review. Michigan Department of Environmental Quality (MDEQ) holds a hearing and a 30-day comment period to solicit proposed changes from the public. MDEQ considers proposals and holds another hearing and comment period on the draft changes to the water quality standards. Citizen petitions for changes to water quality standards between triennial review cycles are considered in the following review

²⁸⁹ Natural Resources and Environmental Protection Act, Act 451 of 1994, part 301 Inland Lakes and Streams, MCL 324.30110; http://www.michigan.gov/deq/0,4561,7-135-3313_3681_28734---,00.html

²⁹⁰ Steve Casey, Upper Peninsula District Supervisor, Water Resources Division

cycle. The 2009-2011 triennial review has just been completed. In this cycle, no changes were proposed by MDEQ, and therefore there was no second hearing or comment period.

In Michigan, water quality criteria are based on compiled safety factors. The state has not set any water quality criteria specifically to protect waters from the impacts of sulfide mining. Relevant water quality criteria and the effluent limits based on them are considered by the state to be conservative. In particular, all heavy metals have water quality criteria because of the Great Lakes Water Quality Agreement.

Michigan's water quality standards allow for removing or downgrading designated uses (Use Attainability Analyses or UAAs) is in the Variance section. Interested parties (or the state) can demonstrate that designated uses cannot be attained.²⁹¹ This process was used to downgrade the uses in the wetland that received discharge from the Callahan Gold mine.²⁹² The discharge into marsh from the mine significantly exceeded nickel, copper and cyanide water quality criteria. The state performed studies to demonstrate the extent of the damage to the ecosystem, yet the agency was, surprisingly, not able to do so. The mine was bought out, and the new company improved the practices and reduced copper and cyanide discharges. Because the nickel levels were not decreasing, the new company performed a UAA and received a site-specific criterion for nickel in the marsh. At this time, the mining has ceased, the nickel is no longer being discharged and the levels are decreasing. The site-specific criterion is no longer in effect.

- **Antidegradation**

Michigan's antidegradation rules apply when discharge is anticipated to result in a new or increased loading of pollutants.²⁹³ Antidegradation requires that that level of water quality necessary to protect existing uses is maintained and protected.²⁹⁴ In high quality waters, the quality must be maintained and protected "unless allowing lower quality is necessary to accommodate important economic or social development in the area in which the waters are located."²⁹⁵ The discharge is not allowed to lower water quality below the minimum level required to fully support designated uses.²⁹⁶ If high quality water bodies are designated as outstanding state resource waters, then controls must be put in place to prevent lowering of water quality. Short-term, temporary lowering may be permitted.²⁹⁷

²⁹¹ R 323.1103

²⁹² 1983-1991.

²⁹³ R 323.1098 (1)

²⁹⁴ R 323.1098 (2)

²⁹⁵ R 323.1098 (3)

²⁹⁶ R 323.1098 (5)

²⁹⁷ R 323.1098 (6)

In the discharge permit for the Kennecott-Humbolt Mill, the extent of the public review of the antidegradation analysis was the following:

The Department has determined that the permittee's Antidegradation Demonstration, based on information required by Subrule (4) of R323.1098, shows that lowering of water quality is necessary to support the identified important social and economic development in the area. This determination is solely for purposes of satisfying state water quality regulations and is not intended to supplant local requirements, including land use or zoning laws. It is not, and should not be construed as, a finding by the Department that the proposed development meets local requirements or ordinances.²⁹⁸

A similar, *de minimus*, analysis was submitted and accepted for the Eagle Mine.

- **Tribal water quality standards engagement**

Tribes in Michigan, as elsewhere, can apply for "Treatment as state" authority and then develop their own water quality standards.²⁹⁹ No tribes in Michigan have received approval for their own standards.³⁰⁰ Staff is not aware of any tribal water quality standards that would supersede state authority in the waters affected by the Eagle project, or of any tribal trust lands in the area. The Keweenaw Bay Indian Community has been engaged in the public process associated with the Eagle project, and have worked toward setting their own water quality standards. The Potawatomi Tribe in Hannahville, west of Escanaba, has also been engaged in the Eagle project; their reservation is about 20 miles away from the Escanaba River watershed, which will receive the mill discharge. The Saginaw Chippewa Indian Tribe has spoken about trying to influence NPDES permits as well.

National Pollutant Discharge Elimination System (NPDES):

- **Wastewater**

In Michigan, the regulated community can sponsor more toxicity testing if they wish to seek less stringent effluent limits. The public also has the opportunity to raise questions and to provide their own toxicity testing if they wish to strengthen the effluent limits.

In Michigan, Discharge Monitoring Reports ("DMRs") are submitted electronically. Staff admitted that high levels, or even exceedances, of pollutants reported in might not be caught in the filing process. These reports for the mining operations are and will be available to the public through the Freedom of Information Act (FOIA) or by request at the Marquette MDEQ office,

²⁹⁸ NPDES permit MI0058649

²⁹⁹ CWA section 518

³⁰⁰ http://water.epa.gov/scitech/swguidance/standards/wqslibrary/mi_index.cfm

but not online. The same is true for NPDES permits themselves. Either public request could require a fee, but documents may also be made available electronically without a fee.

For the Eagle project, specific effluent limitations were written into the NPDES permits for activities at the mill site, but not at the mining site. At the mining site, the dewatering product and storm water will receive reverse osmosis treatment and then be discharged into 40 feet of sand. There is a ground water discharge permit at the mine, and MDEQ reportedly addressed mercury and other potential surface water impacts. Michigan has permits and standards to regulate groundwater discharge that are different from the NPDES program.³⁰¹ The hydraulic connection between the groundwater and surface water may play a role in the fate and transport of mining wastes associated with the Eagle project.

Kennecott can petition for monitoring at the mill site to be removed after a few years.

In the NPDES permit for the Kennecott mill, there are 10 “report only” pollutants³⁰² and a similar number of specific effluent limits. Staff claims that it is not sufficiently protective to have “report only” effluent limitations for mining activity because if there were high levels of a “report only” pollutant discharged, MDEQ would not be able to document the extent of the damage. Apparently, Kennecott created a miniature experimental mill to collect data on the proposed discharge, as is allowed by the mining rules. This experiment allowed them to avoid several specific limits.

The Eagle project NPDES permits do not include compliance schedules³⁰³, but the groundwater permit allows certain activities to begin before all permits and documents are final and submitted - in part because some of the requirements include certifications of controls or procedures that Kennecott must put in place (e.g., construction certification for treatment plant).

In Michigan, permit appeals go to an administrative law judge first and then on to state circuit court.

- **Construction storm water**

In Michigan, the sedimentation and erosion control requirements predated the construction storm water NPDES program. Almost all counties have been granted authority by the state³⁰⁴ to receive, review and approve sedimentation and erosion control plans. All construction activity greater than or equal to one acre must seek coverage under the construction storm water NPDES general permit. Once the plans are approved by the county, MDEQ automatically grants coverage under the construction storm water NPDES general permit.

³⁰¹ 31, MCL 324.31

³⁰² This means that the permit holder needs to monitor and report the results, but that there is no limit for the particular pollutants.

³⁰³ Note Boron limit is initially 250 mg/L and it increases to 285 mg/L after 90 days.

³⁰⁴ Remaining from the county-run sedimentation and erosion control program that preceded construction storm water NPDES permit requirements.

All states have a process to allow citizen petitions that advocate for specific individual permits. In Michigan, this process has reportedly been exercised but never granted. There are no individual construction storm water permits in the state.

Because the act of nonferrous mining **exploration** is not likely to impact an even an acre of land, county sedimentation and erosion control permits and state construction storm water NPDES permits would not apply to that phase of a sulfide mining activity. However, there might be other elements of any given mining operation that would trigger the construction storm water permit. Mining staff must have plan(s) and permit in hand before proceeding with the mining operation.

In the case of the Eagle project, the construction necessary at the mining and the mill sites did trigger the construction storm water general permit. The site of the mining activity was undeveloped and required completely new disturbance of soil. The milling of the ore will occur at a previous mill site and will therefore involve redevelopment.

The sedimentation and erosion control plans are available for public review, but not yet via the web. The mining staff is putting important documents such as these plans online. For the Eagle project, the county submitted the sedimentation and erosion control plan and permit as part of the mining permit.³⁰⁵

Going forward, however, new sulfide mining permit applications will require a construction storm water NPDES permit from the state and storm water management plans will need to be submitted directly to MDEQ. MDEQ is developing a new construction storm water general permit specific to mining construction that recognizes that the mining permit and staff will take over the review and approval of plans (eliminating county review). Staffing considerations include the challenges associated with compliance inspection. It is important to note that the mining staff has received the same training as the county sedimentation and erosion control staff. The county sedimentation and erosion control permit will be removed from the process.

- **Industrial storm water**

In Michigan, industrial storm water is generally addressed as part of an individual wastewater NPDES permit if the applicant has one or intends to obtain one. A storm water management plan is required, but not submitted to MDEQ. At any time, the agency can request a copy. Citizens would have to go through MDEQ to obtain a copy of the plan.

In the case of sulfide mining permit applications, storm water is partially regulated under Part 632 requirements. The mining statute is considered to be a broad umbrella that considers how storm water runs through the mining activities and how to control the pollutants that are likely to be mobilized through mining activities via storm water. The Eagle project, in particular,

included extensive storm water monitoring requirements - reportedly more than would be required by the industrial storm water general permit on its own.

Section 404 – discharge of dredge and fill material

Michigan is one of only two states (New Jersey being the other) that has assumed partial or full responsibility for the regulation of dredge and fill of wetlands. In wetlands not connected to the Great Lakes, the state inland lakes and streams statute applies rather than Clean Water Act section 404 and MDEQ reviews and grants wetland permits. State wetland permits trigger mitigation when one third of an acre is impacted.

When considering wetland impacts of different activities associated with nonferrous mining activity, the exploration sites are not that large and it is unlikely that wetland permits are or would be required for exploration activities. Under the Michigan law, the exploration activity would be regulated under a minor permit, which is similar to 404 nationwide general permits. Addressing cumulative impacts of activities is part of the state program. The examination of the activity must consider the extent and permanence of effects on wetland functions.³⁰⁶

The area of the Eagle project is under the authority of MDEQ rather than the Corps of Engineers. With regard to the Eagle project, MDEQ staff claims that there are no wetland issues at the mine or mill sites. The mill site is at an old mine pit that was used as a tailings basin and now is considered a lake. The lake has sulfide tailings from the gold mine activity in the 1980s.

Section 401 – state water quality certification

Because the state has authority for the examination of wetland impacts and permitting of activities that affect wetlands, Clean Water Act § 401 water quality certification³⁰⁷ does not apply for this project.

Impaired Waters List/TMDL

Biologists and engineers from Lansing are in charge of the regular monitoring statewide. The state monitors on a 5-year watershed cycle, with the goal that each river watershed is sampled every five years. Problems and potential violations documented during an assessment might trigger further upstream/downstream assessment to determine the cause(s) and extent of the problems. Sites found not to be attaining water quality standards are added to the Clean Water Act 303(d) list, which is updated every two years (2012, 2014, 2016, etc.). TMDL dates are assigned for each non-attaining water body, and the TMDL must be developed within 13 years of listing. The current TMDL list goes through 2023. The TMDL includes waste load allocations (point sources) and load allocations (non-point sources), as well as a margin of safety. The NPDES program translates the waste load allocations into enforceable requirements for point sources. Because there is no analogous regulatory program for non-point sources, load allocations are addressed through the implementation of Best Management Practices (BMPs).

³⁰⁶ Natural Resources and Environmental Protection Act, Act 451 of 1994, part 301 Inland Lakes and Streams, MCL 324.30110; http://www.michigan.gov/deq/0,4561,7-135-3313_3681_28734---,00.html

³⁰⁷ CWA Section 401 state water quality certification is only triggered by a federal license or permit.

The TMDL development documentation must show 1) there is reasonable assurance that non-point source controls will be implemented and maintained, or 2) non-point source reductions are demonstrated through an effective monitoring program. In Michigan, implementation plans are typically not part of the TMDL.

With regard to any mining project in the UP, there are very few potential sources of pollution that might be identified, and it would be more effective to revise a NPDES permit to reduce inputs of a pollutant that is causing impairment than to go through the TMDL exercise first. Necessary changes to permits that reduce point source contributions to any identified problem would most likely not happen before a regularly scheduled review and renewal of a NPDES permit (which are required every five years, but delayed due to permit backlog at DEQ).

Staffing levels

There are two people working on mining permits full time. There is an additional part-time support team comprised of staff from all the offices that manage natural resources and pollution programs in Michigan. The state has not received more than two sulfide mining applications at once, and this staffing level has reportedly been sufficient to date.

The staff members on the mining team are predominantly in the Upper Peninsula, but some have been and will be from headquarters in Lansing. There is a substantial state agency presence (approximately 40 staff) in the Upper Peninsula to address the needs posed by the many resource-extracting activities (paper mills, power plants, mines). That is not likely to change in the near term.

B. Clean Water Act Oversight of Sulfide Mining in Minnesota³⁰⁸

Water Quality Standards

The Clean Water Act requires states to designate uses for every water body in the state, develop water quality criteria that are protective of those designated uses and to apply the antidegradation policy to all activities in order to protect existing uses, high quality waters and outstanding national resource waters.

Water quality standards in Minnesota³⁰⁹ assign each water body one or more use designations. Protective water quality criteria are in turn developed to protect those designated uses from harmful water quality impacts that could be caused by activities such as sulfide mining. When water quality criteria differ among applicable designated uses, the most stringent apply.

³⁰⁸ Responses were sought and compiled by Ann Foss, Director Metallic Mining Sector, Industrial Division (651-757-2366). With her responses came the following caveat: These responses are not intended to be legal advice but simply to explain how MPCA operates its programs.

³⁰⁹ MPCA WQS can be found at <https://www.revisor.mn.gov/rules/?id=7050>

WQS adoption and changes to use classes are conducted in accordance with the Minnesota Administrative Procedures Act (this includes public input requirements) and require MPCA Citizens Board and EPA approval. Variances from WQS also require MPCA Citizens Board and EPA approval.³¹⁰

The state has set water quality criteria for constituents that may cause problems from sulfide mining, but not specifically to deal with the impacts of that activity. Currently, MPCA is engaged in a scientific study about wild rice water quality needs. Additional longer-term research is being conducted on wild rice.³¹¹

The current Triennial Review is in its final stages and is anticipated to be final in September 2012.³¹²

- **Antidegradation**

MPCA is revising its antidegradation (nondegradation in Minnesota Rule) to better align with recent EPA guidance.³¹³ It is not clear whether or how nondegradation will be applied to the Polymet NPDES permits.

- **Tribal water quality standards engagement**

Tribes in Minnesota, as elsewhere, can apply for “treatment as state” authority and then develop their own water quality standards.³¹⁴ EPA has approved two sets of tribal water quality standards in Minnesota.³¹⁵

The Fond du Lac and Grand Portage Tribes have adopted their own WQS, and MPCA communicates with them as well as the other tribes in the state on water quality related issues. Both of these tribes have developed sulfate criteria of 10 mg/L to protect wild rice areas.³¹⁶

National Pollutant Discharge Elimination System

- **Wastewater**

³¹⁰ Minnesota Administrative Procedures Act, <https://www.revisor.mn.gov/statutes/?id=14>

³¹¹ <http://www.pca.state.mn.us/index.php/water/water-monitoring-and-reporting/water-quality-and-pollutants/minnesotas-sulfate-standard-to-protect-wild-rice.html>

³¹² <http://www.pca.state.mn.us/index.php/water/water-permits-and-rules/water-rulemaking/proposed-water-quality-standards-rule-revision.html>

³¹³ MPCA current antidegradation rules are at <https://www.revisor.mn.gov/rules/?id=7050.0180> and <https://www.revisor.mn.gov/rules/?id=7050.0185>

³¹⁴ CWA section 518.

³¹⁵ The Fond du Lac Band of the Minnesota Chippewa Tribe (2001) and Grand Portage Band of the Minnesota Chippewa Tribe (2006); see <http://water.epa.gov/scitech/swguidance/standards/wqslibrary/tribes.cfm>.

³¹⁶ Fond du Lac Band (http://water.epa.gov/scitech/swguidance/standards/wqslibrary/upload/2009_03_31_standards_wqslibrary_tribes_chi ppewa.pdf); Grand Portage Band (http://water.epa.gov/scitech/swguidance/standards/upload/2006_11_06_standards_wqslibrary_tribes_grand-portage-band.pdf)

NPDES permits are required for discharge associated with mining process water and reclamation activities in Minnesota. Exploration activities are regulated by the department of health as there is no discharge and it is more likely to affect ground water resources than surface water resources. Citizens may submit comments on any draft NPDES permit during the comment period, and a contested case hearing can be requested. Once a permit is final, citizens can appeal a permit in state court. Citizen suits can also be applied to NPDES-permitted activities associated with sulfide mining.

Discharge monitoring reports (monthly self-reporting completed by the permittee) are available online in Minnesota.³¹⁷

When appropriate, MPCA staff does apply compliance schedules in NPDES permits. Compliance schedules may be employed to meet TMDL allocations.

MPCA is working on eliminating a backlog of wastewater permits due for renewal that have been administratively extended.

All relevant permit writers are currently involved in the Polymet EIS. No effluent limits have been set so it is impossible to determine potential impact of the discharge or adequacy of the permits. The state asserts that all effluent limits will be water quality-based.

- **Construction Storm Water**

Exploration activities or construction activities at the mine site disturbing one acre or more would be covered under the General Storm Water Permit for Construction Activity MNR100001. Minnesota has a citizen petition process for requiring an individual permit, though it has never been exercised.

Storm water management plans (known as Storm Water Pollution Prevention Plans or SWPPP) must be completed prior to submitting any application and before construction begins. Only SWPPPs for sites larger than 50 acres and discharging to special or impaired sites must first be submitted to MPCA no less than 30 days before construction commences.³¹⁸ These plans are available to the public upon request, but not online. For construction projects less than 50 acres, the permit coverage becomes effective just 7 days after the application is postmarked or only 2 days after an online application is complete, thus giving staff only one week (or two days) to review the application. For the larger parcels that must submit the SWPPP, MPCA has 30 days to review the application, or 90 days if an “Alternative Method” is proposed.³¹⁹ In the case of a sulfide mining operation, it is likely that the disturbance requiring a construction storm water permit would be greater than 50 acres. That is the case for the Polymet project.

³¹⁷ <http://www.pca.state.mn.us/index.php/water/water-types-and-programs/wastewater/wastewater-technical-assistance/how-to-complete-your-discharge-monitoring-report-dmr.html>

³¹⁸ MN R100001, page 5.

³¹⁹ Ibid 5-6.

Current inspection and reporting of the effectiveness of storm water management controls at construction sites is considered adequate, yet Discharge Monitoring Reports are not required.³²⁰

MPCA is on schedule with the renewal of the construction storm water general permit. The current permit will expire and a new one will be in effect in 2013. Compliance schedules may be employed to meet TMDL allocations.

- **Industrial Storm Water**

Regulation of storm water controls for active mines and portions of mines undergoing reclamation is usually covered in the individual wastewater NPDES permit for the facility. The permittee can request separate coverage under the Multi-Sector General Permit MNR050000, though it has never happened. The industrial storm water management plan must also be submitted before permit coverage is granted. These plans are available to the public by request, but not online.

The staff has not yet begun the review of the industrial storm water management plan for Polymet, so it is unclear whether the amount of time for review will be adequate.

Reporting on the storm water management controls at a mining site is considered adequate by state officials, yet Discharge Monitoring Reports are not required.

Minnesota's industrial storm water general permit was renewed in May 2011. Compliance schedules may be employed to meet TMDL allocations.

Section 401 – state water quality certification

The state will employ their privilege to certify that 404 permits associated with sulfide mining activity will not violate state water quality standards once the permitting phase begins.

Impaired Waters List/Total Maximum Daily Loads

Minnesota is intensifying its condition monitoring efforts statewide, however, this monitoring is not designed to assess the impacts of specific facilities in the same way that problem investigation monitoring would. Major watershed condition monitoring is designed to pick up signals of pollution problems, leading to further stressor identification and problem investigation monitoring in particular watersheds to identify specific sources.³²¹

MPCA is moving to assess waters annually, though listing occurs every two years. From the time a water body is determined to be impaired until the PCA lists it and submits the list to

³²⁰ Discharge Monitoring Reports are not federally required for construction stormwater general permits. Five states' construction general permits currently include discharge monitoring requirements (CA, WA, OR, GA and VT); Federal Register Volume 77, Number 1 (Tuesday, January 3, 2012), Effluent Limitations Guidelines and Standards for the Construction and Development Point Source Category.

³²¹ For more information on the watershed approach to monitoring, assessment, and investigating and addressing impairments, see: <http://www.pca.state.mn.us/index.php/water/water-types-and-programs/surface-water/watershed-approach/watershed-approach.html>

USEPA, it can be up to about a year. USEPA approval of the list is required to occur within one year of submittal of the list to USEPA by PCA, but it may take longer.

The efficiency of TMDL development (if mining-related impairments are identified) depends upon geographic location. Each of the 81 major watersheds is on a different start year for intensive watershed monitoring between 2006 and 2017. TMDLs would be part of the Watershed Restoration & Protection Strategy developed for each major watershed following monitoring and assessment activities.³²²

In Minnesota, TMDLs must have implementation plans, and implementation requires timely changes to contributing wastewater or storm water NPDES permits. A schedule of compliance pertaining to the TMDL will go into the next NPDES permit reissuance.

Staffing levels

WQS staffing levels are considered adequate to ensure that designated uses are protected from sulfide mining activities.

Staff capacity is considered adequate to perform compliance inspection on construction or industrial storm water controls.

C. Clean Water Act Oversight of Sulfide Mining in Wisconsin

In Wisconsin, there are no active sulfide mines. These mines are known to the agency and addressed in regulations as non-ferrous metallic mines. The Flambeau mine was a sulfide mine and it operated for about five years and closed in 1998.³²³ The Crandon sulfide mine application was submitted in 1994³²⁴ (for the second time) and the staff in the Division of Natural Resources worked on it until 2003 when it was withdrawn.³²⁵

The Flambeau gold mine operated for about five years, and it closed in 1998. The work on the Crandon application started³²⁶ in the mid-1990s and the state worked on it for about eight years (2003). There is a pending lawsuit on the Flambeau reclamation.

An amendment to the mining law passed in 1997 that requires all proposed mines must identify a sulfide mine that has been active for 10 years and protective of the environment as well as one that has been closed for 10 years and reclaimed without environmental problems/violations.³²⁷

³²² <http://www.pca.state.mn.us/index.php/water/water-types-and-programs/surface-water/watershed-approach/watershed-approach.html>

³²³ Paul Luebke, Jim Bertolacini.

³²⁴ Larry Lynch.

³²⁵ The application was withdrawn when the mine site was purchased in 2003 by the Sokaogon Ojibwe and Forest County Potawatomi.

³²⁶ Paul Luebke.

³²⁷ Wisc. Stat. §293.50(2)

There is exploration going on in Wisconsin, although no sulfide mining applications have come in to the department.³²⁸ Division of Water Quality (DWQ) staff that had been involved in the Clean Water Act (CWA) oversight of the Flambeau mine or the application process for the Crandon mine have been shifted to other jobs.³²⁹ Therefore, all the information provided by DWQ staff was provided “according to existing laws and regulations” to the best of their ability without an ongoing project to reference.

Generally, after the Notice of Intent to mine and description of mining plan is filed with the state, the CWA process is triggered. The exact sequencing is different for every mine, however.

Water Quality Standards³³⁰

Wisconsin has not developed any water quality criteria specifically to protect against the potential impacts of sulfide mining. Regarding the specific constituents involved in or resulting from the sulfide mining process, Wisconsin does have standards for copper, mercury, and pH, other heavy metals but it does not have a sulfate standard. Wild rice growing and gathering is the activity or “sensitive use” that could warrant development of a sulfate standard. Wisconsin has not developed a specific “wild rice” designated use; instead, that activity falls under the “fish and aquatic life – coldwater” designated use³³¹ which is generally one of the most sensitive uses requiring protective water quality criteria. Minnesota is in the process of studying the adequacy of their existing 10 mg/L sulfate water quality criterion, and they have shared information about their sulfate criterion with Wisconsin. At this time, the DWQ has no plan to study or develop a sulfate criterion. DWQ staff believes the best option to protect against sulfate problems is to use an existing narrative criterion such as the one that does not allow discharge of any contaminants at toxic levels.³³² Wisconsin does not have a numeric criterion for total suspended solids either. DWQ staff believes they have effectively been able to control sediment through application of narrative criteria.³³³

Wisconsin just completed a triennial for the 2011-2014 cycle³³⁴ and it will soon be sent to EPA. In preparation for the triennial review, DWQ solicits topics from interested parties outside the agency via email. In the results of the solicitation before the just-completed triennial review, development of a wild rice designated use scored low in both public and internal rankings. The agency is, however, considering significant changes to its designated uses in a broader process that is not confined to the triennial review. Up to this point, the agency has made changes to water quality standards on an as-needed basis. In fact, until 2008, Wisconsin was known as the only state that had never gone through a triennial review. EPA had previously mentioned the potential need for a state sulfate criterion, but there was no mention of it during this triennial

³²⁸ Larry Lynch, Amanda Minks, all.

³²⁹ Larry Lynch.

³³⁰ Amanda Minks, Water Quality Standards Specialist, is the source for all water quality standards information unless otherwise cited.

³³¹ NR 102.04(3)(a) Cold Water Communities; <http://dnr.wi.gov/org/water/wm/wqs/usedesignations.htm>

³³² Amanda Minks.

³³³ Ibid.

³³⁴ Ibid.

review. The triennial review was focused on other priorities including the highly controversial numeric phosphorus criterion.³³⁵

- **Antidegradation**

There are changes proposed for the antidegradation policy and implementation procedures. In particular, Wisconsin needs to reduce its allowance of discharge up to one-third of the assimilative capacity of a receiving water body as a *de minimus* discharge.³³⁶ Also, the state antidegradation rules need to be more specific with regard to procedures in high quality waters (alternatives analysis and socio-economic analysis). Staff is assessing what can be addressed in guidance and what needs to be changed in a rulemaking.

- **Public Input**

As mentioned above, DWQ solicits input to the triennial review before proposed changes are developed. In addition, citizens are invited to comment on the draft changes once they are put forth. Citizens have not exercised the right to petition for changes to the water quality standards, however.³³⁷

- **Tribal water quality standards engagement**

Tribes in Wisconsin, as elsewhere, can apply for “treatment as state” authority and then develop their own water quality standards.³³⁸ In Wisconsin, six tribes have developed their own water quality standards.³³⁹ EPA has approved three of these and one of them, the Lac du Flambeau Band of Lake Superior Chippewa Indians of the Lac Du Flambeau Reservation, includes a sulfate criterion for the protection of wild rice. EPA has not yet taken action on this one criterion, however, so it is not in effect under CWA. It may be implementable through consultation with a sovereign nation even without EPA approval.

All of the tribal water quality standards have narrative sulfate water quality standards. The Bad River Tribe’s water quality standards were recently revised.³⁴⁰ During the late 1990s, tribes stopped the proposed Crandon mine proposal on the Wolf River by purchasing the land and mining company.³⁴¹

National/Wisconsin Pollutant Discharge Elimination System (WPDES)³⁴²

- **Wastewater**

³³⁵ NR102.06, NR 217, NR 151; <http://dnr.wi.gov/org/water/wm/wqs/phosphorus/>

³³⁶ NR 207.

³³⁷ Amanda Minks.

³³⁸ CWA section 518.

³³⁹ <http://water.epa.gov/scitech/swguidance/standards/wqslibrary/tribes.cfm#r5>

³⁴⁰ Amanda Minks.

³⁴¹ Ibid.

³⁴² Paul Luebke, Wastewater Engineer provided all NPDES information unless otherwise specified.

WPDES wastewater permits are not required for exploration or prospecting. During the mining and reclamation process, WPDES permits are required for any discharge of water. Effluent limitations are developed either based on existing technology-based standards or water quality-based standards if there are pollutants of concern. The only influence that the antidegradation policy reportedly has is to limit new discharges to 1/3 assimilative capacity of the receiving water body. When a full application to the mining program arrives, a comprehensive package of all the other required permit applications must be submitted at the same time. Mining permit applications go through a master hearing where all the relevant permits are publicly noticed together. Typically, each permit program would deal with comments separately. The Crandon mine application never reached the master hearing.

When the notice of intent was submitted for the Crandon mine, staff explained what studies and monitoring would be needed to develop a full application. First, they required a pilot study of the wastewater to determine treatability. This study required generation of synthetic wastewater and development of a sulfide precipitation treatment system. Staff prepared water quality based effluent limitations for at least copper and mercury at each discharge location. During the pump testing on the Crandon site, concerns arose about the potential for dewatering the site. Wells were put in to test groundwater levels, yet no WPDES permit was needed because no pollutants were discharged from the wells.

The Crandon mine had various discharge locations; the Wolf River, which is a Wisconsin Exceptional Resource Water (ERW), was near the proposed activity. The company proposed several alternative discharge scenarios, however, such as one to the Wisconsin River (because it was a bigger river without the “exceptional” designation) and others to groundwater.

Since there is no standard for sulfate, the staff proposed a 10 mg/L effluent limit (which is the same as Minnesota) based on their best professional judgement. There has also been communication with both Minnesota and Michigan about whether to develop sulfate effluent limits in WPDES permits.

With regard to biochemical oxygen demand (BOD, a measure of oxygen depletion) in the receiving waters below the Crandon mine site, there was no assimilative capacity left. Because the wastewaters from the mine were inorganic, there wasn't much BOD and DWQ staff allowed discharge below detection level which was 2 mg/L.

- **Compliance and Enforcement**

In Wisconsin, Discharge Monitoring Reports (“DMRs”) are available to the public, but not online. Electronic filing of the DMRs has been possible since 1999, but became required only one year ago. Generally, DWQ staff is willing to generate electronic documents of the DMRs. If many records are requested, an excel spreadsheet can be provided. No public use of the agency database is allowed, and citizens may be billed for large requests. Mining DMRs would be treated the same way.

For WPDES, there are 60 days to contest a final permit. If contested, the permit goes to judicial review. In the case of any mining permit, it is assumed that it will be contested.

Citizen suits can be applied to WPDES-permitted activity associated with sulfide mining.

- **Construction Storm Water**³⁴³

The Wisconsin construction general permit has just been reissued upon expiration of the previous permit.

It is reportedly unlikely that exploration or prospecting activities would disturb greater than an acre, and though many exploration sites by one company could be considered a “common plan,” Wisconsin has specific language in its construction storm water rules that explicitly excludes from the definition of “common plan” disturbances that are separated by ¼ mile or more (even if they are performed by the same company).³⁴⁴

Construction activity is considered short term and finite and therefore only a limited amount of the activity associated with a mine will be subject to a construction storm water permit. Once the mining begins, from the first shovelful to last shovelful, the activity is regulated under the mining permit and, if appropriate, the wastewater and industrial storm water permits.

Wisconsin does not require individual construction storm water permits, though there is a process for requiring individual permits (including a citizen petition). It is likely that the state has received a petition requesting an individual construction storm water permit; none has ever been granted. If it has ever been granted for other general permits, it has been rare.

A construction storm water management plan is not required when an application (known as a Notice of Intent - NOI) is submitted for coverage under the construction storm water general permit. This plan is only required upon demand. In Wisconsin, applications are more detailed than in most states. After receipt of an application (NOI), DWQ staff must respond to the applicant within fourteen working days. During this time, they must decide whether more information is required. This evaluation is based on perceived resource impacts. If the applicant hears nothing from the DWQ during that time, permit coverage can be assumed. DWQ avoids granting coverage automatically after 14 days as much as possible. There are differences of opinions as to whether the staff is given adequate time to review an application before granting a permit.

There is no required time frame for DWQ to accomplish a plan review. Once an applicant is told that more information is needed, DWQ staff reportedly attempts to reach a decision in matter of weeks, not months. This process works a lot better now that consultants are more experienced and can make plan modifications quickly. Wisconsin’s construction storm water performance standards³⁴⁵ establish more specific requirements than in most states. When applied to construction at a mining facility, sediment must be controlled as at any construction site.

³⁴³ Jim Bertolacini.

³⁴⁴ Ibid.

³⁴⁵ NR 151

Permittees are not required to submit Discharge Monitoring Reports for storm water WPDES permits (as they are for wastewater WPDES discharges). A technical oversight committee developed performance standards and associated design criteria for best management practices that can achieve them. If a permittee installs BMPs that are designed to meet the required standards, it is presumed that the permittee is in compliance regardless of how the BMP actually performs.

- **Industrial Storm Water**³⁴⁶

There is a clause in the Wisconsin industrial storm water regulations that allows storm water to be regulated under other programs.³⁴⁷ The mining regulations apply to the active moving and extracting of earth. This includes both mining and reclamation.

Metallic mining is a “tier 2” industrial storm water activity, therefore controlling storm water associated with mining activities would be covered under a general permit if it was not part of mining permit. The multi-sector industrial storm water permit doesn’t require chemical monitoring at all. Mining regulations require permittee to account for the quality of runoff that is exposed to overburden. Addressing the storm water requirements under the mining regulations would be closer to an individual permit and more protective than coverage under the industrial storm water general permit.

As mentioned above, there is a process in Wisconsin for citizens to file a petition requesting an activity be covered by an individual, rather than a general, permit. There may have been such petitions filed for industrial storm water, but it is not certain.

The newly reissued industrial storm water general permits address sediment and phosphorus impairment . Wisconsin is developing TMDL standards. Industrial storm water is aggregated in TMDLs, allocating only a small contribution of the sediment or phosphorus loads. Compliance with the general permit is considered compliance with the TMDL allocation. DWQ has the ability to tease out and assign allocations to significant contributors if appropriate, though this has never been done.

Section 404 – discharge of dredge and fill material

³⁴⁶ Since there are no metallic mining examples to draw from, staff answered the questions with non-metallic mining examples (such as gravel mining) in mind; Jim Bertolacini.

³⁴⁷ NR216.21(4) other environmental programs – allows facility to regulate storm water under another program (e.g., mining or wastewater permit), as long as it is at least as stringent. Wisconsin mining rules intend for storm water to be incorporated into the mining permit, however the mining permit doesn’t have any connection to water quality standards.

Wisconsin has robust state wetland regulations, however, sulfide mining is exempt from them. When the mining rules were developed, strong provisions were incorporated to protect wetlands, but these provisions are not as strong as the wetland regulations. Mining projects are allowed to impact wetlands because the mining regulations prioritize the need to be near the ore body. In siting facilities, however, the applicants must identify the alternative that results in the least environmental impact³⁴⁸.

Nevertheless, requirements under section 404 dictating procedures for discharge of dredge and fill material during wetland disturbance or stream alteration still apply. The U.S. Army Corps of Engineers has been delegated this Clean Water Act program and the district offices usually work closely with the state agency staff.

Section 401 – state water quality certification

Does the state employ their privilege to certify that 404 permits associated with sulfide mining activity will not violate state water quality standards?

Impaired water (303(d))/Total maximum daily loads³⁴⁹

Regional staff performs the regular monitoring throughout the state in a five-year rotation. This baseline or trend monitoring is more focused on biology, habitat and conventional parameters, whereas any special investigation would involve other parameters of concern.

The periodic baseline monitoring does not feed into listing decisions. It is a statewide probabilistic survey, stratified by natural communities such as water body type (e.g., warm, cold, headwater). As part of this statewide process, there is also some targeted monitoring at sites for which there is long term trend data. None of this sampling meets the data requirements for impaired waters listing.

What the state calls “Tier 2” monitoring is the targeted monitoring based on problems identified through “Tier 1” biological trend monitoring. There are more sites for this monitoring and results are specifically used for impairment decisions.

If any problems are identified near a mining site during the regular 5-year monitoring (such as a pH problem) then the targeted monitoring would be triggered and potential sources would be assessed.

In addition to the Tier 2 monitoring, there is money available that can be directed toward a specific investigation through a competitive process if a problem is identified by the regular assessment. That type of an investigation could also be instigated through compliance reviews. Regional staff is particularly attuned to local activities that may cause problems, and their oversight and monitoring can adapt to perceived needs.

³⁴⁸ Larry Lynch.

³⁴⁹ Aaron Larson, Water Quality Bureau.

After the Notice of Intent to mine and description of mining plan is filed with the state, instream monitoring is required of the applicant as part of the Environmental Impact Statement process. At that point all the CWA process is triggered, though the exact sequencing is different for every mine.

Once problems are identified and water body segments are placed on the state's 303(d) Impaired Waters List, a Total Maximum Daily Load (TMDL) is required. Wisconsin has over 700 waters on its list and is behind pace for TMDLs. Just a handful of TMDLs were completed recently. The state has hired TMDL modeling staff, and they hope to do more of the work on the plans internally rather than depending on consultants. It is unlikely, however, that problems caused by a mine would be identified, placed on the impaired waters list and addressed by a TMDL plan expeditiously.

Implementation plans are not required by federal statute or regulations and Wisconsin's TMDLs currently do not include them. Therefore, even if a TMDL were to identify that a source, such as a mine, was causing a particular problem, there would not be a clear, timely path to tighten any permits or improve any activities associated with the mine. Any adjustments that must be made to discharges, will not occur until the WPDES permits are up for their 5-year renewal cycle.

The state is reportedly working on guidance for TMDL implementation. There is consideration of watershed-based general permits to address TMDL allocations (which are water body specific) where general permits apply.

Staffing

The many facets of metallic mining applications have been handled previously in a team approach. Water program staff was pulled in as necessary. While there is reportedly a great deal of exploration going on,³⁵⁰ there are no applications in the queue yet. Until a notice of intent is filed, none of the water quality programs are planning any shifting of resources back to metallic mining oversight. The water quality standards staff person has been assigned to review and comment on a nonferrous metallic mining application in the far southwestern reaches of Michigan's Upper Peninsula³⁵¹ because the receiving waters will drain into Wisconsin waters. A Memorandum of Understanding will be signed with Michigan because of the potential downstream implications in Wisconsin waters.

Overall, there are 1.5 people working full time on mining, and many staff members will be pulled in to the team.³⁵² The Crandon mining team was created from existing staff. A couple people were dedicated to the Environmental Impact Statement, but the others spent approximately 25% of their time on the application.³⁵³ While overall staff resources have been reduced, there has been some hiring, some attrition, some lateral transfers, and positions have been modified since previous sulfide mining permits and activities have been active.³⁵⁴

³⁵⁰ Larry Lynch.

³⁵¹ Called "Back 40."

³⁵² Amanda Minks; Paul Luebke.

³⁵³ Paul Luebke.

³⁵⁴ Amanda Minks.

Staff considers their time to be fully allocated and if new mining review responsibilities are to be taken on, other responsibilities will not be fulfilled. If one or more applications come in, there will be a shift of resources to meet the need for review.

Wisconsin doesn't have adequate staff to be focused on compliance inspections at one specific project. Regarding potential future sulfide mining projects, inspection hasn't been discussed. It is assumed that storm water program inspection elements could be assigned to mining staff who are going to be there every day. If a proposal came in, DWQ would analyze how the workload would need to shift.

III. CONCLUSION AND RECOMMENDATIONS

Based on the increased interest in nonferrous metallic mining in all three states due to changes in mining practices, increased value of the metals being mined and a friendlier business and political landscape, it is likely that all three states will soon see more applications to engage in nonferrous metallic mining. Given that reality, the following recommendations would improve the states' ability to ensure that any mining that proceeds is not causing any harm to the surrounding and downstream waters by meeting all requirements of the Clean Water Act.

A. Engage Tribes

All three states have some tribes with EPA-approved water quality standards. If any tribal standards apply where sulfide mines are proposed, it will be helpful to understand them and secure early and meaningful tribal involvement. Tribal standards can be protective of different uses (such as cultural or ceremonial uses) and they can be more stringent than the states.

B. Improve and document public process

There are many varying ways that the public can be involved in the application, evaluation and permitting process for a sulfide mine in all three states (notice, input, hearings). It would be helpful to have a document that summarizes all of the public notice and comment requirements as well as informal processes that the states employ.

C. Specific

- Establish specific designated uses sensitive to sulfide mining (e.g., wild rice, cultural, ceremonial) working with tribes.
- Identify critical water quality criteria that need to be promulgated (e.g., sulfate, TSS [needed in all states], particular metals).
- Map out the ideal antidegradation process for sulfide mines (e.g., alternatives analysis, socio-economic analysis, protections for designated outstanding waters); advocate for improvements.
- Lobby for EPA to develop technology-based effluent limits for sulfide mines (since states do not all have protective numeric criteria which would be necessary for water-quality based effluent limits to be fully protective).
- Advocate for specific inspection and reporting requirements and compliance penalties for sulfide mines through mining regulations and permits (e.g., reporting on wastewater and storm water NPDES, inspection on construction and industrial storm water NPDES and wetland permits and mitigation).
- Examine need for more regulation of exploration sites (construction storm water, wastewater or industrial storm water NPDES permits, state wetland permits, or 404 permits).

APPENDIX B: Summary Table of Indicators and Scores

MI MN WI ON

1. REGULATORY SCOPE

Overall Score:		FAIR	FAIR	FAIR	POOR
1	The state or province regulates a broad array of issues unique to sulfide mining, including: production, transport and fate of acid mine drainage and other contaminants; siting and buffers; heap and dump leaching; waste rock piles and storage; tailings basin management; particulate contributions to acidic conditions on and off site; transportation of acid-producing materials; long-term remediation and short and long-term acid production potential in pit and storage areas.	SOME	YES	YES	SOME
2	The state or province regulates and exhibits comprehension of the structural integrity of mines, including thorough rock mechanics review, lateral support issues and impacts to adjacent lands.	SOME	YES	SOME	SOME
3	The state or province uses an ecosystem-based approach to mining regulation and employs comprehensive and integrated regulation and analysis of air, surface water, ground water and aquifer impacts, and considers all discharges synergistically to determine impacts on bioaccumulative chemicals of concern.	SOME	SOME	NO	NO
4	Regulations are applicable statewide or province-wide.	YES	YES	YES	NO
5	The state or province regulates exploration to ensure protective capping and site remediation, and a thorough review process determines whether exploration is permitted based on the location's appropriateness for future mining.	SOME	SOME	SOME	NO (changes pending)
6	The state or province has an adequate monitoring program that allows for proactive, protective measures to be taken prior to any release or accident.	SOME	NO	SOME	SOME
7	The state or province requires mining and cleanup operations to comply with all applicable state, federal and tribal regulations.	SOME	NO	NO	NO

		<i>MI</i>	<i>MN</i>	<i>WI</i>	<i>ON</i>
8	The state or province requires adequate up-front financial assurance to cover costs for worst-case scenario failures and contingency plan implementation.	SOME	SOME	YES	SOME
9	Financial assurance requirements reach beyond the term of the mining and waste management permits to encompass long-term water treatment needs, etc.	YES	YES	YES	SOME
10	A comprehensive web of effective, interactive regulations protect surface water, ground water, air, land, wildlife habitat, wetlands, endangered species and assess impacts on global warming; mining operations are not exempted.	SOME	SOME	SOME	NO
11	An environmental review process that uses ecological values and carrying capacity is required and is applied to determine where mining will be allowed.	SOME	SOME	YES	NO
12	Numeric standards or determination processes for setting numeric standards are consistently applied to all discharges in every media (water, air, etc.); standards apply to all contaminants from all media and there are standards specifically applicable to sulfide mining contaminants (sulfides, heavy metals, chlorine, etc.).	SOME	SOME	NO	SOME
13	The state or province requires holistic mine plans, including factors like: stability, workers' safety; long-term viability of the mine (not allowing just high-grading), economic plans for communities long-term health, reasonable royalties, past performance of applicant and community priorities as expressed in Master Plans, zoning, etc.	NO	NO	NO	NO
14	Mining sites must be returned to a functioning ecosystem that does not require perpetual care post-mining.	YES	NO	NO	SOME
15	The state or province requires that all impacts, on and off site, be analyzed, assessed and included in permitting decisions.	SOME	SOME	YES	NO
16	The state or province requires a cumulative impacts analysis that includes impacts from any beneficiation or transportation of the facility's ore in the state or province.	YES	YES	SOME	SOME

		<i>MI</i>	<i>MN</i>	<i>WI</i>	<i>ON</i>
17	The state or province requires contingency plans for any potential failures.	YES	YES	YES	NO

2. REVIEW PROCESS

Overall Score:		POOR	FAIR	FAIR	
1	The state or province requires applicants and permittees to submit supporting data sufficient to provide for meaningful and substantive review of the application or request.	NO	YES	YES	NO
2	The state or province is supportive of and cooperative with other applicable regulatory regimes including federal and tribal governments.	NO	YES	SOME	SOME
3	The state or province has an integrated process for assessing applications integrating input. The process should include cross-disciplinary review and input from fellow agencies that is unhampered by political pressure.	SOME	SOME	SOME	NO
4	The state facilitates and incorporates feedback from public participation in all aspects of environmental review, application assessment, permitting and enforcement.	NO	SOME	SOME	NO/ SOME
5	Consent by any impacted tribe/First Nation is required for mine approval.	NO	NO	NO	NO
6	Standards and criteria are concrete, clear and easily enforced. Self-realizing standards are best (like the WI “Prove it first” law).	NO	NO	YES	NO/ SOME
7	Standards for reclamation and remediation are in place prior to mining; the applicant must demonstrate that they can be met prior to an application gaining approval.	YES	YES	YES	SOME /NO
8	Government-to-government consultation results in tribal requests being integrated into the permitting process and enforceable.	NO	NO	NO	NO
9	The state or province denies permits if they do not meet the regulatory standards.	NO	N/A	N/A	NO/ SOME
10	All state or province analytical materials and data are available to the public.	SOME	YES	YES	SOME
11	The state or province requires that all data supporting an application be available to the public.	YES	YES	YES	SOME

		<i>MI</i>	<i>MN</i>	<i>WI</i>	<i>ON</i>
12	The state or province supplements applicant-provided data with its own, independently-gathered data.	SOME	SOME	SOME	NO/ SOME
13	Tribes/First Nations impacted by a mine proposal have delegated authority, if desired, for regulation and enforcement of environmental standards and adequate resources to pursue that authority.	NO	NO	NO	NO
14	The state or province ensures that regulators do not have financial conflicts of interest in making permit decisions.	SOME	YES	YES	YES
15	Public funds may not be committed to financing or assisting project development until environmental review is completed.	NO	SOME	NO	NO
16	Financial assurance is calculated transparently and well-before any permit is issued.	YES	YES	YES	NO/ YES
17	Financial assurance, including its amount and devices, is developed collaboratively with financial as well as environmental expertise.	NO	N/A	N/A	N/A

3. ENFORCEMENT

Overall Score:		POOR	FAIR	GOOD	FAIR
1	The state or province has adequate enforcement policies in place, including authorization to: issue stop orders and corrective action orders, to assess civil penalties, to impose costs of inspections, and attorney and staff costs. States should have written enforcement policies that are available to the public.	SOME	YES	YES	SOME
2	The state or province provides for citizen intervention in state enforcement actions and for citizen suits, with attorney's fees for prevailing citizens.	SOME	SOME	YES	SOME
3	The state or province allows citizen intervention in state proceedings. States allow citizens to intervene in permit proceedings or appeals and in state suits.	YES	SOME	YES	SOME

		<i>MI</i>	<i>MN</i>	<i>WI</i>	<i>ON</i>
4	The state or province facilitates an atmosphere in which environmental protection is the top priority of the regulatory scheme and those charged with implementing it; agencies do not view themselves or act like agents of the industry.	NO	SOME	SOME	NO
5	The state or province has adequate enforcement capabilities, including dedicated staff time and expertise.	NO	N/A	N/A	SOME
6	The state or province requires personnel to conduct inspections and enforcement of mining and cleanup operations sufficiently frequently and ensures that problems are addressed promptly.	NO	NO	NO	SOME
7	Citizens have access to all enforcement data.	SOME	YES	YES	SOME
8	Reclamation, enforcement and monitoring is enabled beyond the life of the permit.	YES	YES	YES	SOME
9	Post-closure enforcement is strong, with adequate resources and public involvement.	N/A	N/A	N/A	SOME/ NO (water quality)
10	Immediate independent judicial review is available to citizen plaintiffs.	NO	NO	YES	SOME
11	Citizens can initiate and participate in inspections.	SOME	SOME	SOME	SOME
12	Parent and successor corporations and other materially participating entities are obligated to assume permit requirements.	SOME	YES	YES	YES
13	Permit conditions and work plans are reviewed at least annually.	N/A	YES	YES	SOME
14	The agency has authority to modify permit conditions whenever necessary (“adaptive management”), and exercises that authority as needed.	YES, N/A	YES, N/A	YES, N/A	NO
15	Any permit variances, amendments, or changes requested by the permittee are rare and uncontested.	NO	N/A	N/A	N/A

4. PROGRAM RESOURCES

Overall Score:		POOR	FAIR	FAIR	POOR
1	The state or province provides adequate funding, staffing, external experts and time to agencies responsible for mining regulation programs for thorough review of permit applications, modifications to permits, enforcement activities and post-closure cleanup activities.	NO	SOME/ N/A	SOME	NO
2	The state or province charges a permit application fee commensurate with permitting costs to support its mining regulation programs. States should require a permit application fee that is dedicated to use by the mining regulatory body.	NO	YES	YES	NO
3	The state or province allows civil penalties to be used by the mining regulation program.	NO	NO	NO	NO
4	Financial assurance is required in a form that is safe from creditors and is utilized and available when needed.	SOME	YES	SOME	SOME

5. REPORTING AND OFFICIAL STATEMENTS

Overall Score:		FAIR	FAIR	GOOD	FAIR
1	The state or province provides and/or requires accurate, adequate and truthful legally-required reports informed by statistically appropriate, high-quality data.	NO	NO	YES	YES
2	All monitoring reports, and the raw data that informs them, are available to the public in easily accessible (electronic) formats before, during and after mining.	SOME	SOME	YES	SOME

GLOSSARY

AMD	Acid Mine Drainage: Acidic runoff water from mining operations, waste dump, and mill tailings ponds containing sulfide minerals. Acidity can promote the solubilization of heavy metal contaminants and must be treated before release into the natural environment.
Aquifer	An underground bed or layer of permeable rock, sediment, or soil that yields water.
Beneficiation	Crushing and separating mined ore into valuable substances and waste. This includes crushing, milling, concentrating, smelting, and refining processes.
Bioaccumulation	Accumulation of toxic substances in an organism that can lead to chronic poisoning.
Capping	Closure of an underground mine by placing a permanent impediment in the opening of the mine to the surface.
Carrying capacity	Maximum population of a species that can be sustained in a given environment.
CERCLA (aka Superfund)	Comprehensive Environmental Response, Compensation, and Liability Act, 42 USC §9601 et seq. (1980), taxes chemical and petroleum industries to fund federally-authorized responses to releases or threatened releases of hazardous substances.
Cumulative impact	Environmental impact(s) caused by an activity when added to other past, present, and reasonably foreseeable future activities.
CWA	Clean Water Act, 33 USC §1251 et seq. (1972), establishes the structure for regulating discharges of pollutants into U.S. waters and regulating surface water quality.
EAW	Environmental Assessment Worksheet: A first-step environmental assessment used in Minnesota to determine whether an EIS is warranted, roughly equivalent to an EA.
EA	Environmental Assessment: A first-step environmental assessment

used to determine whether there may be a significant environmental impact from the proposed activity meriting the creation of a full EIS.

EIA	Environmental Impact Assessment refers generally to an assessment of environmental impacts
EIS	Environmental Impact Statement: A comprehensive analysis of all potential environmental, social, and economic effects of a proposed activity that is likely to have significant environmental impacts.
Ecosystem	A system in a given area including all living organisms and the physical environment functioning together as a unit.
Financial Assurance	A financial instrument provided by an operator to the state or province to cover the cost of the operator's failure to comply with the law, permit conditions, or administrative orders, usually based upon a condition or occurrence requiring remediation. Sometimes referred to as a reclamation bond performance bond, conformance bond, or etc., depending on the specific mechanism or purpose of the instrument.
Heap leaching (aka dump leaching)	A hydrometallurgical process that extracts metals from broken rock piles (called heaps or dumps) by application of chemical leaching solutions.
High-grading	Mining only the portions of an orebody containing the highest grade of the material sought.
Homeostasis	Maintenance of a constant condition or set of properties when exposed to external environmental changes.
Midcontinent Rift System (aka Keweenaw Rift)	A 1200-mile-long geological rift extending from Ontario through parts of Wisconsin, Minnesota, Michigan and down to Nebraska and Kansas. The rift left behind thick layers of exposed rock in the northern sections, containing numerous nonferrous metallic minerals such as copper, nickel and zinc.
Nonferrous Metallic Mineral	A metallic mineral in which iron is not the predominant metal
NPDES permits	Federal discharge permits are called National Pollutant Discharge Elimination System permits, or "NPDES". Most states are delegated authority to operate the CWA discharge program and issue these permits.

Post-closure	Period following completion of reclamation.
RCRA	Resource Conservation and Recovery Act, 42 USC §6901 et seq. (1976) regulates the generation, transportation, treatment, storage, and disposal of hazardous wastes.
Reclamation	Following mining activities, reconditioning land to a state useful for productive purposes or rehabilitating land to its original state for the protection of natural resources.
Remediation	Actions necessary to prevent, minimize, or mitigate injury to public health or the environment, including cleanup and treatment of hazardous materials released or threatened to be released.
Sulfide Ore	Any of a number of mineral formations consisting of metal sulfides, e.g. zinc sulfide or copper sulfide.
Taconite	Low-grade iron ore (containing 25-30% iron)
Tailings basin	A pond to contain tailings (material rejected from a mill after extraction of the valuable minerals and ground up to sand or silt size) to allow heavy metals to settle out before water is discharged.
Watershed	An area of land where all the water under it or flowing through it drains to the same watercourse or body of water.

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Primary Codes and Rules Governing Nonferrous Metallic Mining

Michigan:

Statutes: Part 632 of the Natural Resources and Environmental Protection Act, “Nonferrous Metallic Mineral Mining”, at MCL §324.63201 to 324.63223

Rules: “Nonferrous Metallic Mineral Mining”, Administrative Rules §§ 425.101 to 425.602

Full text of the statute and rules is available online at http://www.michigan.gov/documents/deq/DEQ-OGS-metallic-mining-Part632_308856_7.pdf

Minnesota:

Statutes: Ch. 93 of the Minnesota Code, “Reclamation of Lands”, at Minn. Stat. §§ 93.44-93.51. Full text available online at <https://www.revisor.mn.gov/statutes/>

Rules: “Nonferrous Metallic Mineral Mining”, Administrative Rules §§ 6132.0100 – 6132.5300. Full text available online at <https://www.revisor.mn.gov/rules/?id=6132>

Wisconsin:

Statutes: Chapter 293 of the Wisconsin Code, “Metallic Mining”, at Wis. Stat. §§293.01 - 293.95. Full text available online at http://docs.legis.wi.gov/statutes/statutes/293/_10

Rules: Administrative Rules Ch. 130 (“Metallic Mineral Exploration”), Ch. 131 (“Metallic Mineral Prospecting”, Ch. 132 (“Metallic Mining”), Ch. 182 (“Metallic Mining Wastes”). Full text available via searchable index at <http://legis.wisconsin.gov/rsb/code.htm>

Ontario:

Legislation: Mining Act, R.S.O. 1990, c. M.14. Full text available at http://www.e-laws.gov.on.ca/html/statutes/english/elaws_statutes_90m14_e.htm.

Regulations: Mine Development and Closure Under Part VII of the Act, O. Reg. 240/00. Full text available at http://www.elaws.gov.on.ca/html/regs/english/elaws_regs_000240_e.htm.

Effluent Monitoring and Effluent Limits – Metal Mining Sector, O. Reg. 560/94. Full text available at http://www.e-laws.gov.on.ca/html/regs/english/elaws_regs_940560_e.htm.

Metal Mining Effluent Regulations, SOR/2002-222. Full text available at <http://laws-lois.justice.gc.ca/eng/regulations/SOR-2002-222/index.html>.

Interviews and Personal Communications

<u>Name</u>	<u>Organization</u>	<u>Jurisdiction</u>
Harold (Hal) Fitch	Michigan Department of Environmental Quality, Office of Geological Survey	MI
Al Gedicks	University of Wisconsin, Wisconsin Resources Defense Council	WI
John Coleman	Great Lakes Indian Fish and Wildlife Council	WI
Larry Lynch	Metallic Mining Inspection and Exploration Program, Wisconsin Department of Natural Resources (former)	WI
Kim Lapakko	Principle Engineer, Minnesota Department of Natural Resources	MN

Jennifer Engstrom	Mineland Reclamation Section Manager, Minnesota Department of Natural Resources	MN
Patience Caso	Campaign Director, Minnesota Environmental Partnership	MN
Betsy Daub	Friends of the Boundary Waters Wilderness Policy Director	MN
Ann Foss	Minnesota Pollution Control Agency	MN
Ramsey Hart	MiningWatch Canada	ON
Laura Blondeau	Ministry of Northern Development and Mines	ON
Dean Therrien	Ministry of the Environment	ON

Additional Resources (Online)

<u>Organization</u>	<u>Site address</u>
Michigan Sierra Club	http://michigan.sierraclub.org/issues/greatlakes/sulfideminig.html
Save our Sky Blue Waters	http://www.sosbluewaters.org/
Save the Wild UP	http://savethewildup.org
Minnesota Environmental Partnership	http://www.mepartnership.org/sites/GREATLAKES/index.asp
Great Lakes Indian Fish and Wildlife Commission	http://www.glifwc.org
Save Lake Superior Association (MN)	http://www.savelakesuperior.org/
Wisconsin Resources Protection Council	http://www.wrpc.net

Rio Tinto Kennecott Eagle Mine	http://www.eagle-project.com
Duluth Metals	http://www.duluthmetals.com/s/DuluthComplex.asp
Water Legacy (MN)	http://waterlegacy.org
Friends of the Boundary Waters Wilderness	http://www.friends-bwca.org/issues/sulfide-mining
Yellow Dog Watershed Preserve	http://www.yellowdogwatershed.org/blog/category/sulfide-mining/
Wisconsin Department of Natural Resources	http://www.dnr.state.wi.us/org/aw/wm/mining/metallic/
Michigan DEQ, OGS Metallic Mining Program	http://www.michigan.gov/deq/0,1607,7-135-3311_4111_18442---,00.html
Minnesota Department of Natural Resources, Division of Lands and Minerals	http://www.dnr.state.mn.us/lands_minerals/index.html
Acid Drainage Technology Initiative	http://www.techtransfer.osmre.gov/NTTMainSite/Initiatives/ADTI/adti.shtm
MiningWatch Canada	http://www.miningwatch.ca/home
Mines and Minerals Division, Ontario Ministry of Northern Development and Mines	http://www.mndm.gov.on.ca/mines/default_e.asp