STATE OF MINNESOTA
COURT OF ADMINISTRATIVE HEARINGS
FOR THE DEPARTMENT OF NATURAL RESOURCES

In the Matter of Minnesota Environmental Rights Act Challenge to Minn. R. 6132.2000	**FINDINGS OF FACT, CONCLUSIONS OF LAW, AND ORDER** **CAH Docket No. 25-2004-39617**

The above-captioned matter came before Administrative Law Judge (ALJ) Megan J. McKenzie for a contested case hearing from November 4, 2024, to November 13, 2024, at the Court of Administrative Hearings (the CAH) in Saint Paul, Minnesota. The matter involves a challenge to Minnesota Rule 6132.2000 (2023) under the Minnesota Environmental Rights Act (MERA). *See* Minn. Stats. § 116B.01-116B.13. Phillip S. Pulitzer, Oliver J. Larson, and Brian Carter, Assistant Attorneys General, appeared on behalf of the Minnesota Department of Natural Resources (DNR). Heather M. McElroy, Michael V. Ciresi, Katie Crosby Lehmann, Jacob F. Seigel, and Melissa A. Goodman, of Ciresi Conlin LLP, appeared on behalf of Northeastern Minnesotans for Wilderness (NMW). John A. Kvinge and Peder A. Larson, of Larkin Hoffman Daly & Lindgren Ltd., appeared on behalf of Twin Metal Minnesota, LLC (TMM). Judge McKenzie issued a Recommendation, including Findings of Fact and Conclusions of Law, on May 12, 2025. Her Recommendation was not a final decision, and the Record was certified to DNR to issue an order. Minn. Stat. § 116B.10, subd. 3.

DNR Commissioner Sarah Strommen delegated authority to issue the final agency decision to Colonel Rodmen Smith, the Director of the DNR's Division of Enforcement. In a letter dated May 28, 2025, Col. Smith notified the parties of the opportunity to file arguments and exceptions before the Record closed at 4:30 p.m. on January 12, 2026, which the parties timely filed. With

their arguments and exceptions, NMW and TMM also filed requests for oral argument. In a letter dated January 13, 2026, Col. Smith confirmed the closure of the Record and denied the requests for oral argument.

Based upon a review of the Record and the parties' filings, the Commissioner makes the following findings of fact, conclusions of law, and order.

FINDINGS OF FACT AND APPLICABLE LAW

1. The Commissioner has reviewed the Record of this matter, including the transcripts, exhibits, and briefs, along with the arguments and exceptions the parties filed, together with the ALJ's Findings of Fact, Conclusions of Law, and Recommendation.

2. Minnesota Statutes, section 14.62, subdivision 1, requires that every decision and order issued by an agency in a contested case must be in writing and must be based on the Record. The decision must also include the agency's findings of facts and conclusions of law on all material issues. *Id.* If the agency rejects or modifies a finding of fact, conclusion of law, or recommendation of the ALJ, the agency's decision must include the reasons for each rejection or modification. *Id.*

3. When reviewing the ALJ's Recommendation, the ALJ's decision is entitled to some weight, but the agency decision-maker owes no particular deference to the ALJ's findings, conclusions, or recommendation. *In re Grand Rapids Pub. Utils. Comm'n,* 731 N.W.2d 866, 870 (Minn. Ct. App. 2007); *see also In re Excess Surplus Status of Blue Cross & Blue Shield of Minn.,* 624 N.W.2d 264, 274 (Minn. 2001) ("[The Commissioner] was not required to treat the ALJ's recommendation with the same deference an appellate court must accord the findings of a trial court, as the ALJ's report is only one part of the record.").

4. The agency decision-maker may not consider evidence outside the record, but "may utilize their experience, technical competence, and specialized knowledge in the evaluation of the

evidence in the hearing record." *In re Excess Surplus Status of Blue Cross & Blue Shield of Minnesota,* 624 N.W.2d at 274 (cleaned up). The Minnesota Supreme Court has emphasized that agencies should employ "their expertise to reach independent decisions and not to simply 'rubber stamp' the findings of a hearing examiner." *City of Moorhead v. Minn. Pub. Utils. Comm'n*, 343 N.W.2d 843, 846 (Minn. 1984) (citing Minn. Stat. § 14.60).

5. NMW, as the party proposing that a certain action be taken in this contested case portion of the proceedings under MERA, has the burden to prove the facts at issue by a preponderance of the evidence. Minn. R. 1400.7300, subp. 5. To show something by a preponderance of the evidence, the party must show it is more probable that a fact exists than that it does not. *Christie v. Est. of Christie*, 911 N.W.2d 833, 839 (Minn. 2018).

6. The Commissioner adopts ALJ Findings 1-19 in their entirety. The Commissioner agrees that these findings accurately reflect the procedural history of this matter.

7. The Commissioner adopts ALJ Findings 20-31 in their entirety. The Commissioner agrees the Boundary Waters Canoe Area Wilderness (BWCAW) is an "irreplaceable national treasure." Pristine waters and extensive undeveloped land serve as critical habitat for diverse wildlife and make the BWCAW one of the most highly visited wilderness areas in the United States.

8. The Commissioner adopts ALJ Findings 32-39 in their entirety. The Commissioner agrees these findings accurately reflect the legislative history of the BWCAW and the Rainy River Headwaters (RRH) watershed. The Commissioner also notes that this legislative history reflects a desire to protect the pristine nature of the BWCAW.

9. The Commissioner adopts ALJ Findings 40-52 in their entirety. The Commissioner agrees these findings accurately reflect the substance and the administrative and legislative history of Minn. R. 6132.2000 (the Mine Siting Rule).

10. The Commissioner rejects ALJ Finding 53. TMM argues this finding exceeds the stipulated scope of the contested case hearing before the ALJ. TMM A&E at 4, 7. In particular, TMM maintains this finding implicates any potential remedy at a future stage of the case should the Commissioner conclude the Mine Siting Rule is inadequately protective under MERA. *Id.* DNR agrees with TMM that this issue was not before the ALJ but disagrees that any modification of the finding is necessary because the ALJ "did not make any findings regarding the remedy" in this finding. DNR A&E at 20. NMW, on the other hand, disagrees that this finding is beyond the scope of the contested case hearing. NMW A&E Reply at 19 n.4. Instead, NMW asserts that "evaluating the adequacy of the boundaries of the [Mineral Management Corridor] goes to the heart of the ALJ's assigned inquiry." *Id.*

11. The Commissioner agrees with TMM and DNR that this finding exceeds the stipulated scope of the contested case hearing because it directly implicates the potential remedy of a MERA violation. *See* ALJ Finding 19. The Commissioner can, and does, decide the two issues here regarding potential (1) water impacts and (2) noise and light impacts to the BWCAW from nonferrous metallic mineral mining in the RRH watershed without delving into the adequacy of the MMC boundary itself. Whether expansion of the MMC boundary is an appropriate remedy is explicitly not part of this stage of the case. The Commissioner disagrees with DNR that adopting the finding is nevertheless appropriate. As previously noted, the adequacy of the MMC may be implicated and decided at a future stage of the proceeding, and the Commissioner declines to adopt

a finding without a full and fair opportunity for all parties to litigate the issue. Accordingly, the Commissioner rejects ALJ Finding 53.

12. The Commissioner adopts ALJ Findings 54-58 in their entirety. The Commissioner agrees, and the parties have stipulated, that federal and state laws and regulations must be considered together to determine whether the Mine Siting Rule is adequate to protect the BWCAW from water, noise, and light impacts. *See* ALJ Finding 19.

13. The Commissioner adopts ALJ Findings 59-90 in their entirety. The Commissioner agrees these findings accurately reflect the Mine Reclamation Rules in Chapter 6132 of the Minnesota Administrative Rules. The Commissioner notes Chapter 6132 contains extensive requirements for mines at all stages of their life cycle; including design, operation, closure, and post-closure. The Commissioner also agrees the Mine Reclamation Rules reflect that each mine and permit will be individually tailored through environmental review due to unique challenges and characteristics faced at each mine site or proposed mine site.

14. The Commissioner adopts ALJ Findings 91-110 in their entirety. The Commissioner agrees these findings accurately reflect the environmental review process. The Commissioner notes that the environmental review process for a proposed mine is extensive and involves substantial opportunities for public hearings and comments, as well as administrative and judicial review.

15. The Commissioner adopts ALJ Findings 111-151 in their entirety. The Commissioner agrees these findings accurately reflect the extensive protections for waters in the BWCAW, as well as the substantial regulation of any waters that flow into the BWCAW. The surface waters of the BWCAW are designated as prohibited Outstanding Resource Value Waters.

ALJ Finding 134.[1] Prohibited ORVWs receive the highest level of protection possible under law. ALJ Finding 133. Accordingly, for a prohibited ORVW, like the surface waters of the BWCAW, any net increase in loading or other cause of degradation is prohibited. ALJ Finding 135.

16. TMM argues the Commissioner should amend ALJ Finding 137 and delete entirely ALJ Findings 138-139. TMM A&E at 10-13. TMM asserts the ALJ should have, but failed, to address the concept of "loading offset," which TMM maintains allows for "additional capacity for proposed net increases in loading if" such loading occurs with a concurrent upstream or adjacent decrease in loading that compensates for any other increase. *Id.* DNR counters that loading offsets are inapplicable to the BWCAW because a loading offset can only occur with a proposed net increase in loading. DNR A&E at 13-14. And, as DNR argues, because the BWCAW are prohibited ORVWs for which no net increases in loading are allowed, a "loading offset" cannot occur. *Id.* NMW agrees with DNR and maintains this issue was never raised by TMM until the Arguments and Exceptions. NMW A&E Reply at 7-8.

17. As an initial matter, the Commissioner agrees with NMW that the issue of loading offsets was not before the ALJ during the contested case and it is inappropriate for TMM to address in the first instance during final agency review. *Cf. Thiele v. Stich*, 425 N.W.2d 580, 582 (Minn. 1988). Regardless, the Commissioner agrees with DNR and NMW that loading offsets are inapplicable to the BWCAW. Minnesota Rule 7050.0255, subpart 23, cited by TMM, provides that "loading offset" means "reductions in loading from regulated or unregulated activities, which reductions create additional capacity for *proposed net increases in loadings*." (emphasis added). Because the surface waters of the BWCAW are prohibited ORVWs, any net increase in loading is prohibited. Minn. R. 7050.0265, subp. 7. As applied to prohibited ORVWs, the term "net increase

[1] Citations to an ALJ Finding incorporate by reference all evidence cited in that ALJ Finding.

in loading or other causes of degradation" means *any* loading for a new activity not subject to an existing permit. Minn. R. 7050.0255, subp. 26. Because a "loading offset" by definition is intended to "create additional capacity for proposed net increases in loading"—and net increases in loading are not allowed in prohibited ORVWs—loading offsets are inapplicable here. The Commissioner therefore rejects TMM's request to amend or delete ALJ Findings 137-139.

18. The Commissioner adopts ALJ Findings 152-155 in their entirety. The Commissioner agrees these findings accurately reflect the regulation of noise in Minnesota.

19. The Commissioner adopts ALJ Findings 156-157 in their entirety. The Commissioner agrees it is unclear whether the BWCAW would be considered Noise Area Classification 1 or 4. The Commissioner also agrees the standards of Noise Classification 1 would allow the noise equivalent of a loud restaurant (65 dB(A)) in the BWCAW, which all parties agreed would negatively impact the wilderness experience in the BWCAW. Tr. Vol. 4 at 78-79 (Sauvageot). TMM argues ALJ Finding 156 should be amended to conclude DNR need not solely rely on the Minnesota Pollution Control Agency's (MPCA's) noise regulations to protect the BWCAW from noise pollution because it can use federal regulations, guidelines, or existing sound levels in a natural area to set restrictions on a case-by-case basis through permitting. *See* TMM A&E at 15-16. However, as NMW points out, if there are no applicable noise standards for wilderness, then there is nothing from which to craft case-by-case restrictions. NMW A&E Reply at 17-18. Moreover, if DNR were to develop a standard to use on a case-by-case basis to set project-specific restrictions, this could be construed as unpromulgated rulemaking. *See* DNR A&E at 18; Minn. Stats. §§ 14.02, subd. 4; 14.381. The Commissioner declines TMM's request to amend ALJ Finding 156.

20. TMM further asserts ALJ Findings 156 and 157 should be amended to distinguish between noise impacts on the wilderness experience at the boundary of the BWCAW and in the interior of the BWCAW. TMM A&E at 15-17. TMM argues visitors to the edge of the BWCAW are already exposed to some anthropogenic noise and there is no material evidence that mining noise would negatively affect the experience of these users. *Id.* The Commissioner rejects TMM's requested amendments. TMM has provided no legal basis for why the wilderness experience at the boundary of the BWCAW should be treated differently under the regulatory scheme than the experience in the interior when the entire BWCAW is categorized as wilderness. Moreover, simply because some anthropogenic noise already exists in a part of the BWCAW—boundary or otherwise—does not make it any less worthy of preservation as a wilderness area.

21. The Commissioner adopts ALJ Finding 158 in its entirety. The Commissioner further finds the Wilderness Act does not implement a *per se* ban on all activity having some impact (including noise impacts) on the BWCAW. But the regulatory framework for noise pollution is inconsistent with the Wilderness Act because the standards it provides, regardless of which Noise Area Classification applies to the BWCAW, do not protect the BWCAW as wilderness as defined under the Act. Wilderness Act, Pub. L. No. 88-577, § 2(c); 78 Stat. 890,891 (1964).

22. The Commissioner adopts ALJ Findings 159-162 in their entirety with one correction to ALJ Finding 160. In ALJ Finding 160, the ALJ found: "In Minnesota, local governments may pass ordinances that regulate outdoor lighting to reduce *noise* pollution, and the Department of Administration is required to create a model ordinance for local governments to use when developing their light pollution regulations." (emphasis added). The Commissioner finds the word "noise" was used in error and should be replaced with "light."

23. The Commissioner adopts ALJ Finding 163 in its entirety. TMM takes exception to this Finding and argues it should be stricken. TMM A&E at 17-18. TMM argues no credible evidence in the Record supports finding dark skies are a reason people visit the BWCAW. *Id.* The ALJ relies on Dr. Fristrup's testimony that dark skies are a reason people visit the BWCAW. ALJ Finding 163 (citing Fristrup Pre-Filed Direct at 36). Dr. Fristrup was qualified as an expert and could give his opinion as long as it had foundational reliability. Minn. R. Evid. 702. His opinion was supported by articles attached to his written testimony documenting the importance of dark skies to visitors to wilderness areas. Fristrup Pre-Filed Direct at 39-40, 48-50. Those using the BWCAW "find the deep sensory isolation from man's activities a major attraction of the region." Fristrup Pre-Filed Direct, Att. 29 at DNR090818. It is one of less than twenty-five locations in the world designated as an International Dark Sky Sanctuary for its exceptional night skies. Chambers Pre-Filed Direct, Att. 8 at DNR147911; J. Engstrom Pre-Filed Direct at 6:113-14; Ex. 102; Ex. 224. Based upon the support in the Record evidence, the Commissioner rejects TMM's request to strike this finding.

24. The Commissioner adopts ALJ Findings 164-175 in their entirety. The Commissioner agrees these findings accurately reflect federal decisions relevant to mining in the RRH watershed. The parties have not alerted the Commissioner to any change in the status of Public Land Order No. 7917.

25. The Commissioner adopts ALJ Findings 176-185 in their entirety. The Commissioner agrees these findings accurately reflect the hydrogeology of the RRH watershed. The Commissioner emphasizes the importance of water quality in the RRH watershed because many of these waters flow directly into the BWCAW.

26. The Commissioner adopts ALJ Findings 186-207 in their entirety. NMW argues ALJ Finding 205, in which the ALJ found that "there is insufficient data to determine whether the mining-related sulfate loads are flowing out of Birch Lake, and if so, how far downstream the loads are travelling," is unsupported by the Record. NMW A&E at 9-20, 31-35. The Commissioner acknowledges that NMW presented extensive evidence about the potential risks posed by a theoretical future copper-nickel sulfide mine in the RRH watershed. *See id.* In particular, NMW asserts its experts show a connection between two existing mines in the RRH watershed (the closed Dunka Mine and the currently operating Peter Mitchell Pit) and downstream sulfate levels. *Id.* at 12-13, 18-19, 31-32. NMW cites these mines, the sulfate data (much of which was collected by NMW), and its experts to argue a future mine located in the RRH watershed will likely result in a violation of the antidegradation standards. *Id.* at 29-35. DNR responds that its own expert testified the data and evidence were too limited to reach the conclusion drawn by NMW and its experts. DNR A&E at 14-16. DNR then argues the Commissioner should respect the findings made by the ALJ who heard all the testimony live. *Id.*

27. The Commissioner agrees with DNR. This issue presents a classic battle of the experts. The ALJ was in the best position to judge the credibility of the witnesses, and ALJ Finding 205 reflects an implicit credibility finding in favor of DNR's expert. The Commissioner, having independently reviewed the record, finds it is appropriate to adopt the ALJ's credibility determinations on this issue, including the persuasiveness of the experts' respective credentials. The Commissioner also notes the broader context relevant to this finding. NMW, as the party asserting a MERA violation, bears the burden of proving such a violation by a preponderance of the evidence. *See* Minn. R. 1400.7300, subp. 5; *In the Matter of Amends to Various Water Appropriation Permits*, Nos. A24-0943, A24-0958, A24-0959, A24-0960, A24-0976, 2025 WL

1927507, at *8 (Minn. Ct. App. July 14, 2025) (holding that the burden of proof falls on "the party seeking to change the status quo" (cleaned up)). DNR correctly points out that it was not its or its expert's role to prove a lack of a MERA violation, but to rebut whether NMW met its burden. The Commissioner addresses the weight of the evidence in the attached Memorandum, which is incorporated by reference here. The Commissioner therefore declines NMW's request to reject ALJ Finding 205.

28. The Commissioner adopts ALJ Findings 208-213 in their entirety. These findings accurately reflect that wild rice is an important cultural, ecological, and economic resource in Minnesota. The record demonstrates that wild rice is particularly sensitive to sulfate levels in surface waters, such that Minnesota has a specific low sulfate water quality standard in wild rice waters, like many waters in the RRH watershed. Accordingly, water sulfate levels and their potential impact on wild rice populations would likely be a component in environmental review of any proposed mine in the RRH watershed.

29. The Commissioner adopts ALJ Finding 214 in its entirety. The Commissioner also finds that a mine can operate twenty-four hours a day, seven days a week, for decades. Fristrup Pre-Filed Direct, Att. 33 at NMW0000025, 30.

30. The Commissioner adopts ALJ Finding 215 in its entirety. TMM argues this Finding should be amended to reflect that the findings within it are speculative, theoretical, and based upon a mine operating without mitigation measures. TMM A&E at 20-22, 27. As further explained and incorporated in the Memorandum, the Commissioner concludes the findings are not unduly speculative or theoretical but based on sound scientific methodology and the credible testimony of Dr. Fristrup. He used an industry standard noise propagation model although TMM's expert, Mr. Sauvageot, disagreed with choices Dr. Fristrup made in applying the model. Fristrup

Pre-Filed Direct at 15-17; Sauvageot Pre-Filed Direct at 10-11; Sauvageot Pre-Filed Rebuttal at 3-5. The Commissioner finds Dr. Fristrup's testimony to be more persuasive than Mr. Sauvageot's. Dr. Fristrup's estimates for sound propagation were consistent with the Minnesota Regional Copper Nickel Study and the U.S. Forest Service's Soundscapes Report. Tr. Vol. 2 at 136; Fristrup Pre-Filed Direct, Att. 29 and 33. The Commissioner further finds that because this is a challenge to a regulation, and not a specific mine project, it is necessary and reasonable to rely on hypotheticals and estimates to project an impact.

31. The Commissioner adopts ALJ Findings 216 and 217 in their entirety and also finds the impacts from noise pollution will not cease when the noise ceases. Fristrup Pre-Filed Direct at 34. The Commissioner emphasizes that raising the hearing threshold for organisms and effectively deafening them in the areas where mining noise penetrates the BWCAW is a generalized—but consequential—impact. TMM argues Finding 216 should be amended to clarify that any impacts from mining noise on wildlife or people are speculative and the Record does not identify likely impacts on any particular species of wildlife or quantify the magnitude of the impact. TMM A&E 23-27.

32. As explained in the Memorandum, and incorporated by reference here, the Commissioner does not find the impacts to be speculative. Further, because this is a challenge to a regulation and not a specific mine, the Commissioner finds that identifying specific impacts to a particular species, including the magnitude of such impacts, is not reasonable nor appropriate. A more generalized impact to natural resources from noise pollution is sufficient because specific impacts would vary based on the design and location of a mine in the RRH. The Commissioner rejects TMM's amendments to Finding 216.

33. TMM also argues Finding 217 should be amended to reflect that any hearing loss or other noise impacts are temporary and will cease when the noise ceases. TMM A&E at 27. TMM asserts Finding 217 should also be amended to reflect the impacts are theoretical and will vary significantly depending upon where the mine is constructed and operated. *Id.* The Commissioner rejects TMM's proposed amendments to Finding 217. While TMM is correct that impacts may vary based upon mine location and design, Dr. Fristrup provided credible testimony that the impact to hearing thresholds is not theoretical. Fristrup Pre-Filed Direct at 3, 15-17; Tr. Vo. 2 at 123-24, 132-33. Additionally, mines operate continuously for years, and Dr. Fristrup provided testimony that noise over longer time scales can exclude wildlife from otherwise suitable habitat. Fristrup Pre-Filed Direct at 33-34. Recolonization may not happen for years after the noise ceases, which is not a temporary impact. *Id.*

34. The Commissioner adopts ALJ Findings 218-225 in their entirety. TMM argues these findings should be amended. TMM A&E at 27-28. Regarding Finding 218, TMM requests that it be amended to clarify that light pollution from a mine "theoretically" can project enough light to be visible many miles into the BWCAW "if not appropriately managed." *Id.* at 27. The Commissioner rejects TMM's proposed amendment. The regulatory scheme for light requires no mitigation management and the difference between "can" and "theoretically can" is *de minimis*; neither prescribes certainty.

35. TMM argues Finding 219 should be amended to clarify that sky glow is not the most widespread type of pollution but the most widespread "potential" type of light pollution. TMM A&E at 27. The Commissioner rejects this amendment. The Finding correctly reflects the testimony supporting it. Fristrup Pre-Filed Direct at 34.

36. TMM also argues Finding 220 should be amended to again clarify that increases to BWCAW sky glow are "potential" if "not appropriately managed" and in "theory" could jeopardize the BWCAW's dark skies and status as a Dark Sky Sanctuary. TMM A&E at 28. The Commissioner rejects TMM's requests to amend this finding. As previously stated, there are no light standards to require mitigation, so, while mitigation could reduce the likelihood of sky glow, it is not necessary to qualify the ALJ's finding with the phrase "not appropriately managed." Moreover, the Commissioner finds the testimony underlying the finding is credible and not theoretical. Fristrup Pre-Filed Direct at 39. As further discussed in the Memorandum, and incorporated by reference here, the ALJ specifically found Dr. Fristrup's testimony "credible" and "useful" and found the testimony of the opposing expert witness on light, Dr. Bylhouwer, to be "neither credible nor particularly useful." ALJ Memorandum at 56 n.463. The ALJ was in the best position to judge the credibility of the witnesses, and the Commissioner, having independently reviewed the record, finds no reason to stray from the ALJ's credibility determination on this issue.

37. TMM further asserts Finding 220 should be amended to reflect that any increases in sky glow and light domes would not be uniformly visible through the BWCAW and less likely to impact areas already exposed to visible anthropogenic activity. TMM A&E at 28. As further discussed in the Memorandum, and incorporated by reference here, the Commissioner is not persuaded by TMM's argument to distinguish between effects on the wilderness experience at the boundary of the BWCAW from the interior and rejects TMM's proposed amendment.

38. TMM further argues Finding 221 should be amended to reflect that sky glow will disappear "immediately" rather than "shortly" after source lights are extinguished. TMM A&E at 28. TMM also asserts this finding should be amended to clarify that ecological effects of light pollution on wildlife are theoretical and the Record does not indicate whether specific species

would be affected in the BWCAW and the quantity and magnitude of the effect. *Id.* The Commissioner reiterates that species-specific impacts are not appropriate for the review of a regulation rather than a specific project. Additionally, the ALJ's finding that sky glow will disappear "shortly" after lights are extinguished is directly supported in the Record, and the Commissioner finds no credible reason to deviate. The Commissioner rejects TMM's requested amendments to ALJ Finding 221.

39. TMM also asserts Finding 222 should be amended to add that light domes can be produced by cities, airports, and ball fields in addition to mines, and the impact of domes can depend upon where they are located and how they are mitigated. TMM A&E at 28. The Commissioner does not find these amendments to be meaningful or necessary and rejects them. The ALJ's finding already expresses that light domes can be produced by sources other than mines, including cities, airports, and ball fields. ALJ Finding 222. And, as previously discussed, mitigation is not required under the regulatory framework for light and, therefore, adding that impacts could be affected by mitigation is unnecessary, even if true.

40. TMM additionally asserts Finding 225 should be amended to conclude that lighting from mining "could have negative effects" rather than "will have substantial negative effects" on the BWCAW and only "if not appropriately managed." TMM A&E at 28. The Commissioner rejects TMM's amendment because the ALJ's finding that light pollution "will have substantial negative effects" is directly supported in the Record. Fristrup Pre-Filed Direct at 40; *see also* Tr. Vol. 2 at 143-44, 146-47. TMM further argues the finding be amended to reflect that increases in sky glow or light domes would not be uniform across the BWCAW and would be more likely to have an effect in areas where anthropogenic activity is already visible. TMM A&E at 28. The Commissioner likewise rejects this amendment because, as previously stated, the Commissioner

is not persuaded by TMM's argument to distinguish between effects on the wilderness experience at the boundary of the BWCAW and the interior.

41. The Commissioner adopts ALJ Findings 226-227.

CONCLUSIONS OF LAW

1. The Commissioner adopts ALJ Conclusions 1-23 in their entirety, except for ALJ Conclusion 22, which is amended as described further below. NMW disputes the ALJ's Conclusions regarding water quality in several ways.

2. First, NMW asserts that the ALJ did not properly consider the appropriate "conduct" at issue in her MERA analysis. The Commissioner disagrees for the reasons set forth in the attached Memorandum, which are incorporated by reference here.

3. Second, NMW's request to reject the ALJ's Conclusions on water quality go to the merits of the ALJ's analysis of the *Schaller* factors, which are addressed below and in the attached Memorandum. NMW A&E at 16-34.

4. The parties do not dispute that second and fifth *Schaller* factors, and the Commissioner agrees with the ALJ's analysis of those factors. *See* ALJ Conclusions 13-14.

5. The Commissioner also agrees with the ALJ that the first, third, and fourth *Schaller* factors are "closely related" and it is appropriate to consider them together in this case. *See* ALJ Conclusion 15. As detailed further in the attached Memorandum, which is incorporated by reference here, the Commissioner agrees with the ALJ's analysis that the Record does not support that the risks identified by NMW—primarily violations of water quality standards for sulfate pollution—are likely to occur.

6. The Commissioner does, however, amend ALJ Conclusion 22, in which the ALJ concluded that, "[a]s a practical matter, it is likely currently impossible for a mine to comply with

the antidegradation water quality standard, and thus obtain a permit." TMM A&E at 13-15. TMM argues the ALJ's Conclusion is unsupported by the Record and requests this sentence be stricken from the conclusion. DNR counters that the ALJ's conclusion is "logical" because "she spent nearly a hundred findings across sixteen pages explaining the regulatory process that such a future mine would have to proceed through: environmental review and permitting." DNR A&E at 12. NMW agrees with DNR. NMW A&E Reply at 7.

7. The Commissioner agrees with TMM that ALJ Conclusion 22 goes too far but does not delete it entirely. DNR presented evidence that any proposed mine in the RRH watershed would undergo extensive environmental review and would need to demonstrate it could meet the strict antidegradation water quality standards. *See* Tr. Vol. 6 at 24, 81-82 (Cole); Cole Pre-Filed Direct at 10-14; J. Engstrom Pre-Filed Direct at 13-16, 22; Tr. Vol. 6 at 10-11 (J. Engstrom); J. Engstrom Pre-Filed Rebuttal at 3, 6, 9-11; Tr. Vol. 6 at 114-115 (Haugen); Haugen Pre-Filed Rebuttal at 13. This review would likely demand certain operational and design elements to the mine that could include exclusively underground mining, transport of ore and waste rock outside the RRH for processing and disposal, significant water purification, and other requirements. J. Engstrom Pre-Filed Rebuttal at 6, 11. Such review, and the economics of implementing such requirements, however, remain hypothetical and uncertain. Tr. Vol. 2 at 28-29 (Brezonik). While such requirements would likely pose significant challenges to any proposed mine in the RRH watershed, the Record does not support that it is "likely currently impossible" for a proposed mine to do so. The Commissioner therefore amends ALJ Conclusion 22 to replace ". . . it is likely currently impossible for a mine to comply . . . ." with ". . . it is likely challenging for a mine to comply . . . ."

8. Balancing all the *Schaller* factors, the Commissioner agrees with the ALJ that NMW has failed to show by a preponderance of the evidence that the Mine Siting Rule, Minn. R. 6132.2000, together with the water quality standards for the BWCAW, is not adequate to protect the waters of the BWCAW from pollution, impairment, or destruction, as defined in Minn. Stat. § 116B.02, subd. 5, arising from nonferrous metallic mineral mining in the RRH watershed. NMW has therefore failed to show a violation of MERA Section 10 as applied to water quality.

9. The Commissioner adopts ALJ Conclusions 24-27 in their entirety, with the amendments detailed below. TMM takes exception to these conclusions, which informed the ALJ's determination that the *Schaller* factors were met for noise and light. TMM A&E at 18-26, 29. TMM asserts all these conclusions should be amended in various ways based upon arguments presented through its analysis of the *Schaller* factors, which it asserts the ALJ misapplied. *Id.* The Commissioner is unpersuaded by TMM's arguments in support of its amendments and rejects TMM"s proposed amendments as explained in the Memorandum, which is incorporated by reference here.

10. The Commissioner also amends ALJ Conclusion 24 to add that while it is impossible to determine the percentage of the BWCAW that could be degraded based on a hypothetical mine that could be located anywhere in the RRH, the impact is, as the ALJ concluded, likely, and the adverse effect of this noise pollution—raising the hearing threshold—in the context of the wilderness area is severe.

11. The Commissioner also amends ALJ Conclusion 25 to add that the jeopardization of the BWCAW's status as an International Dark Sky Association Dark Sky Sanctuary is a severe effect as further explained in the Memorandum, which is incorporated by reference here.

12. The Commissioner further concludes that noise pollution from a nonferrous metallic mineral mine operating in the RRH would have consequential effects on other natural resources within the BWCAW—specifically, wildlife. The likely propagation of noise up to twenty-five miles into the BWCAW would not only raise the hearing threshold for visitors and degrade their wilderness experience but also raise the hearing threshold for wildlife. Tr. Vol. 2 at 123 (Fristrup). Raising the hearing threshold for some wildlife could impact their ability to detect threats or food. Fristrup Pre-Filed Direct at 23-24. While the impact to any particular species of wildlife cannot be determined based on a hypothetical mine, the quality of the impact is significant, and if multiple mines are permitted in the RRH, the scope of the impact could increase with each mine and potentially the aggregate noise as well. Based on evidence in the Record, the consensus of the scientific community is that anthropogenic noise impacts wildlife in combination with other factors, and the impact can begin to be seen at about 40dB(A). Fristrup Pre-Filed Direct, Atts. 35-38; Ex. 216.

13. The Commissioner adopts ALJ Conclusion 28 but amends it to find that the adverse effects from noise and light pollution will not only be long-term because mining operations can operate twenty-four hours a day for decades, but also because once the mining does cease, it can take years after the cessation of long-term noise pollution for wildlife habitat recolonization to occur. Fristrup Pre-Filed Direct at 34. The long-term effects of light are noted in ALJ Conclusion 27.

14. The Commissioner adopts ALJ Conclusion 29 in its entirety. The ALJ expressly stated that the second and fifth *Schaller* factors were met, but did not specifically state the first, third, and fourth *Schaller* factors were met for noise and light. ALJ Conclusions at 13-15. The Commissioner therefore expressly finds, as further discussed in the Memorandum and

incorporated by reference here, that the Record evidence weighs in favor of finding that the first, third, and fourth *Schaller* factors have been met for both noise and light. Balancing the *Schaller* factors, the Commissioner finds that NMW met its burden to show by a preponderance of the evidence that the noise and light impacts from nonferrous mineral mining are likely to constitute a material adverse effect on the BWCAW.

15. The Commissioner adopts ALJ Conclusion 30 in its entirety.

16. The Commissioner adopts ALJ Conclusion 31 in its entirety. Subject to the parties' right to judicial review of this decision, DNR shall initiate a rulemaking proceeding to amend Minn. R. 6132.2000 or promulgate a new rule to sufficiently protect the BWCAW from noise and light pollution arising from nonferrous metallic mineral mining in the RRH watershed.

17. The Commissioner adopts ALJ Conclusions 32-33 in their entirety and likewise states that any portion of the Commissioner's Findings of Fact above and Memorandum below that are properly considered a Conclusion of Law are incorporated herein.

18. For these reasons, as well as the Commissioner's Memorandum below which is incorporated herein, the Commissioner adopts the ALJ's Recommendations.

Date: April 10, 2026

SARAH STROMMEN
Commissioner

By: __/s/ Rodmen Smith_____
Col. Rodmen Smith
Enforcement Director
Department of Natural Resources
500 Lafayette Road
St. Paul, MN 55155-4020

MEMORANDUM

I. Procedural Background

On June 24, 2020, NMW filed the underlying lawsuit against the DNR and the Commissioner in Ramsey County District Court under Minn. Stat. § 116B.10. NMW alleged that the DNR's nonferrous metallic mineral mine siting rule—Minn. R. 6132.2000—is inadequate to protect the BWCAW from pollution, impairment, or destruction. On September 30, 2020, TMM filed a notice of intervention in the suit.

Actions under section 116B.10 undergo a three-stage procedure. *See* Minn. Stat. § 116B.10, subds. 2, 3. First, plaintiffs have the burden of making a prima facie showing that the challenged regulation is inadequate to protect the natural resources from pollution, impairment, or destruction. Second, upon such showing the district court shall remit the action to the state agency to institute the appropriate administrative proceedings to consider and make findings necessary to issue an order of the adequacy of the regulation. Third, the district court retains jurisdiction for purposes of judicial review to determine whether the agency order is supported by the preponderance of the evidence.

Here, the DNR and NMW stipulated that a remand to the agency, in accordance with the second stage of the procedure, would be appropriate. On October 4, 2021, DNR issued a procedural order on remand that established a public comment period. After engaging in a thorough technical review of over 4,000 comments, DNR issued Findings of Fact, Conclusions of Law, and an Order on Remand on May 31, 2023 (Order on Remand). The Order on Remand found that Minn. R. 6132.2000 is adequate to protect the waters of the BWCAW from pollution, impairment, or destruction. However, the Order on Remand further found that Minn. R. 6132.2000 was inadequate to protect the BWCAW from noise and light pollution arising from potential nonferrous metallic

mineral mining in the RRH watershed. Thus, the Order on Remand ordered the agency to undertake rulemaking to expand the size of the MMC. NMW and TMM each made timely demands for contested case hearings. On November 7, 2023, DNR initiated the contested case proceeding at the CAH. On December 16, 2023, the parties stipulated to the following issues for hearing:

a. Is Minn. R. 6132.2000, together with the water quality standards for the BWCAW, adequate to protect the waters of the BWCAW from pollution, impairment, or destruction (as defined in Minn. Stat. § 116B.02, subd. 5) arising from nonferrous metallic mineral mining in the Rainy River Headwaters watershed?

b. Is Minn. R. 6132.2000 adequate to protect the BWCAW from pollution, impairment, or destruction associated with noise and light impacts arising from nonferrous metallic mineral mining in the Rainy River Headwaters watershed?

The contested case hearing was held from November 4, 2024, to November 13, 2024. The parties filed post-hearing briefing on February 19, 2025. On May 12, 2025, the ALJ issued the Recommendation concluding the preponderance of evidence establishes that Minn. R. 6132.2000 and the water quality standards for the BWCAW are adequate to protect the water of the BWCAW from pollution, impairment, or destruction; but Minn. R. 6132.2000 is inadequate to protect the BWCAW from pollution, impairment, or destruction associated with noise and light impacts arising from nonferrous metallic mineral mining in the RRH watershed. The ALJ recommended that DNR initiate a rulemaking proceeding to sufficiently protect the BWCAW from noise and light pollution. In accordance with Minn. Stat. § 14.61, subd. 1, and by letter dated May 28, 2025, the Commissioner's Designee notified the parties of the opportunity to file arguments and exceptions, which the parties did. The administrative record closed on January 12, 2026.

II. Standard of Review

Minn. Stat. § 14.62, subd. 1, provides that all decisions rendered by an agency in a contested case must be in writing and must be based on the record of the administrative proceeding. Further, the agency is required to provide written findings of fact and conclusions of law on all material issues at issue in the contested case hearing. *Id.* If the agency modifies, rejects, or remands the ALJ's recommendation on any issue, the agency's final order must also include the reasons for the rejection or each modification. *Id*.

When reviewing the recommendation of the ALJ, the agency owes no particular deference to the recommendation; it should not simply rubber stamp the findings of the ALJ. *Id*. But the ALJ's recommendation "is entitled to some weight" and the agency "should not take lightly the ALJ's findings." *In re Grand Rapids Pub. Utils. Comm'n,* 731 N.W.2d at 870; *Bloomquist v. Comm'r of Nat. Res.*, 704 N.W.2d 184, 190 (Minn. Ct. App. 2005).

An agency's determination will be upheld, even though it rejects or modifies the ALJ's recommendation in whole or in part, as long as its decision does not reflect an error of law, is not arbitrary and capricious, and its determination is supported by substantial evidence in the record. *Cable Commc'n Bd. v. N.W. Cable*, 356 N.W.2d 658, 668 (Minn. 1984); *Bloomquist*, 704 N.W.2d at 189. When the record leaves open the possibility of more than one opinion of a matter, the agency's determination will be upheld so long as there is a rational connection between the facts found by the agency and the decision made. *Id*. But deviations from the ALJ recommendation must be explained based on the evidence found in the administrative record. *Id*.

III. Analysis

A. The ALJ Correctly Applied the Minn. Stat. § 116B.10 Standard.

NMW asserts the ALJ focused on the wrong "conduct" in her MERA analysis and "rather than assess the likelihood that an operating copper nickel sulfide mine in the RRH watershed would

'during operations or closure,' violate a water quality standard or cause a material adverse impact to the BWCAW, the ALJ merely assumed that MPCA's strict antidegradation standard would prevent a copper nickel sulfide mine from being permitted in the first place." NMW A&E at 15-20. DNR supports the ALJ's analysis as consistent with MERA because "a MERA Section 10 challenge does not ask whether the unregulated conduct of copper nickel mining would cause pollution, impairment, or destruction, it asks whether the mine siting rule, working in conjunction with environmental quality standards such as the antidegradation standard, is adequate to prevent pollution, impairment, or destruction." DNR A&E at 9-10; *see also* DNR Post-Hrg. Br. at 3-5. In essence, NMW argues the ALJ improperly assumed environmental rules would not be violated by a permitted mine in the RRH watershed and DNR counters that the ALJ must assume such rules will be followed. The truth, as it often does, lies somewhere between these two positions.

NMW is correct that the MERA Section 10 inquiry includes whether the conduct at issue is "likely to violate [] any environmental quality standard[.]" Minn. Stat. § 116B.02, subd. 5. Accordingly, the MERA inquiry cannot assume that all environmental standards will be followed, which would result in circular logic that would undercut the purpose of MERA. But DNR is also correct that the MERA inquiry cannot presume a particular mine has been permitted in the abstract. And DNR also rightly notes that Minnesota law carries a presumption of regularity and correctness in agency actions. DNR Post-Hrg. Br. at 5-7; *United States v. Chem. Found.*, 272 U.S. 1, 14-15 (1926); *In re Excess Surplus Status of Blue Cross & Blue Shield of Minnesota,* 624 N.W.2d at 278; *Rsrv. Min. Co. v. Herbst*, 256 N.W.2d 808, 824 (Minn. 1977).

The Commissioner therefore analyzes the MERA Section 10 claim considering all evidence in the record in view of the burdens and presumptions that apply here. This approach is consistent with the inclusive approach that all probative evidence is considered during contested

case proceedings. Minn. Stat. § 14.60; Minn. R. 1400.7300. The Commissioner's analysis thus includes NMW's evidence of the potential likelihood of environmental standards violations post-permitting and environmental review, DNR's and TMM's arguments about the persuasiveness of that evidence, NMW's burden of proof, and the appropriate presumptions and deference afforded to agency actions, including DNR's evidence about the extensive scope of environmental review. The ALJ's analysis properly and explicitly considered the evidence of impacts from the Dunka Mine and Peter Mitchell Pit on water quality in the RRH watershed and balanced the persuasiveness of that evidence against the more stringent modern antidegradation water quality standards, the enactment of which post-date those mines. *See* ALJ Findings 91-110, 198, 204; ALJ Memorandum at 53-54.

B. NMW Has Not Established that Minn. R. 6132.2000 is Inadequate to Protect the Waters of the BWCAW from Pollution, Impairment, or Destruction.

i. There is Insufficient Data to Conclude by a Preponderance of the Evidence that Mining-Related Sulfate Loads are Flowing from Birch Lake into Fall Lake at the Entrance of the BWCAW.

NMW's sulfate data, and the conclusions drawn therefrom, were a key dispute among the parties that warrant further discussion here. Specifically, NMW contended that data on sulfate levels in waters from the RRH watershed demonstrated that existing mines in the watershed were increasing sulfate levels in waters that flowed into the edge of the BWCAW. NMW A&E at 12-13, 31-35. From this, NMW asserted that any future mine in the RRH watershed would similarly, and by extension, likely result in an increase in sulfate loading into the BWCAW, which would in turn violate the antidegradation standards and MERA. *Id.*

Dr. Patrick Brezonik was one of NMW's experts to testify on sulfate impacts. He is a Professor Emeritus at the University of Minnesota in the Department of Civil, Environmental, and Geoengineering. Tr. Vol. 2 at 9-10. Dr. Brezonik has significant experience collecting and

analyzing sulfate impacts in bodies of water and was directly involved in the review of MPCA's proposed sulfate standard for wild rice. *Id.* at 10-11; Brezonik Pre-Filed Direct at 3. Dr. Brezonik testified that, in his expert opinion, the water sample collection and testing methods used by NMW produced high quality data. Tr. Vol. 2 at 13; Brezonik Pre-Filed Direct at 9. He also opined that, based on these data, sulfate concentrations are elevated in Birch Lake compared to other waters in the RRH watershed that are not impacted by mine discharges. Tr. Vol. 2 at 17. Dr. Brezonik then concluded that a new mine operating in the RRH watershed would result in elevated sulfate levels in the BWCAW. *Id.* at 25.

NMW also put forward as an expert Dr. Daniel Engstrom, who is a retired research scientist for the St. Croix Watershed Research Station at the Science Museum of Minnesota. D. Engstrom Pre-Filed Direct at 1. Dr. Engstrom testified that nearly all the waters in the RRH watershed have naturally low sulfate levels. *Id.* at 5. He similarly concluded based on the sulfate data that waters impacted by mining had around two to three times higher sulfate levels than those waters that were not impacted by mining. *Id.* at 7-8.

NMW also put forward as an expert Dr. Thomas Myers, who is an independent hydrologic consultant that has worked professionally on hydrogeologic matters since 1983. Myers Pre-Filed Direct at 1. Dr. Myers' testimony focused on reviewing existing water quality data to analyze the sources of sulfate loading in the RRH watershed and to determine to what extent sulfate flowed into Birch Lake, travelled through the Kawishiwi River system and into Fall Lake and, ultimately, the BWCAW. *Id.* at 3-43; Tr. Vol. 1 at 127; Ex. 134. Dr. Myers testified that two taconite mines in the RRH watershed—the Peter Mitchell Mine and the Dunka Mine—are currently releasing a significant amount of sulfate into the system that is measurable at least twenty-three miles downstream from Birch Lake. Myers Pre-Filed Direct at 31. Dr. Myers further opined that any

new mine would essentially be a new geologic feature that would change the groundwater hydrology in perpetuity. Tr. Vol. 1 at 129. Based on existing water quality data, Dr. Myers testified that a new mine and its attendant facilities are likely to add more sulfate into Birch Lake which will travel through surface water and groundwater along the "path of pollution" into the BWCAW. Myers Pre-Filed Direct at 77.

To rebut these expert opinions, DNR put forward Dr. Zachary Wenz, who is a research scientist in geochemistry for DNR. Wenz Pre-Filed Direct at 2. Dr. Wenz testified that Dr. Brezonik's and Dr. Myer's conclusions regarding mine-caused sulfate loading to Birch Lake and Fall Lake were unreliable due to the limited dataset from which they were drawn. *Id.* at 8; Tr. Vol. 5 at 111-112. First, Dr. Wenz criticized that the samples did not have a full analysis of charge balance, which compares the amount of positively and negatively charged ions in water. Wenz Pre-Filed Direct at 9-10. Without this information, Dr. Wenz testified, there was no scientific basis to compare sulfate concentrations from samples collected in different locations at different times. *Id.* Dr. Wenz explained that DNR requires charge balance analysis on water samples when evaluating environmental impacts of a mining project. *Id.* Dr. Wenz further opined that there were likely multiple other sources of sulfate loads that could flow into the path of Birch Lake to Fall Lake, including septic systems, fertilizer runoff, vehicle exhaust, motorboats, and the chemistry of the rock in the RRH watershed itself. *Id.* at 10-11; Tr. Vol. 5 at 113-114.

Dr. Myers and Dr. Brezonik also relied on a more limited dataset of sulfate samples to conduct their analysis. Namely, their analysis was limited to eight lakes and rivers and intentionally excluded all sulfate data that was not measured using the EPA 300 method. Brezonik Pre-Filed Direct at 6; Ex. 2 at 6. Comparing several sites using the EPA 300 method vs another method (the turbidimetric method), Dr. Brezonik testified the two methods produced different

sulfate levels, the latter around twice the former, which in his opinion justified relying only on data collected using the EPA 300 method. Brezonik Pre-Filed Direct at 6. While limiting the dataset may make for a more direct comparison, it nevertheless limits the total data and thus the conclusions that can reasonably be drawn from those data. And the EPA 300 method generally resulted in lower sulfate levels, which necessarily excludes higher sulfate levels detected using other methods. This, in turn, could artificially lower the "background" sulfate levels as well as the distribution of ranges, described below, that comprise the "background."

One basis for Dr. Brezonik's conclusions on sulfate loading was that the average sulfate concentration in the water samples analyzed (the background) was 1.5-1.7 mg/L, whereas the levels in Fall Lake were 2.6-2.7 mg/L. Tr. Vol. 2 at 18. From this, Dr. Brezonik concluded there were elevated sulfate levels in Fall Lake, which he asserted could be attributed to upstream mines. *Id.* at 18-19. Dr. Brezonik conceded, however, that the sulfate levels in Fall Lake were close to one standard deviation and within two standard deviations of the "background" sulfate levels. *Id.* at 37-42. This means the sulfate levels detected in Fall Lake could simply be within the normal range of natural background sulfate levels. Dr. Brezonik, however, did not conduct any statistical analysis of the samples. *Id.* at 36; *see also* Tr. Vol. 5 at 106-108, 139-142; Ex. 315. Indeed, Dr. Wenz identified a lake in the BWCAW, Muskeg Lake, that had a sulfate concentration similar to Fall Lake. Tr. Vol. 5 at 106-108, 139-142; Ex. 315. While Muskeg Lake consists of a single data point from a shallow lake, it nevertheless demonstrates that the significant conclusions drawn by Dr. Brezonik, Dr. Engstrom, and Dr. Myers are not supported by the limited datasets upon which they rely. The Commissioner therefore agrees with the ALJ that the conclusions drawn by NMW's water quality experts concerning increased mine-related sulfate loading in the RRH watershed lack sufficient support in the record.

ii. NMW Has Not Established that the Environmental Review Process is Insufficiently Protective of Water Quality.

Another significant conflict between the parties concerns the sufficiency of environmental review at preventing future water quality violations. NMW argued that environmental review and permitting is flawed and cannot ensure water quality violations will not occur. NMW A&E at 4-6. In support of its argument, NMW relies on the Kuipers and Maest Study and the Modern Mine Study, as well as the testimony of Dr. David Chambers, which NMW asserts demonstrate mines that go through environmental review and permitting nevertheless result in water quality violations. *Id.*; NMW Post-Hrg. Br. at 30-31. DNR responds that these studies are inapposite because they involve mines not comparable to a proposed nonferrous mine in the RRH watershed. DNR A&E at 5-6; DNR Post-Hrg. Br. at 21-22.

The Kuipers and Maest Study was released in 2006 and compared pollutant discharges that were predicted during environmental review with actual discharges later in the mines' operations. Tr. Vol. 2 at 63-64; Chambers Pre-Filed Direct at 12-18. Dr. Chambers was a peer reviewer of this study. Chambers Pre-Filed Direct at 13. The study concluded that all eight mines in the study have degraded water quality in downstream surface waters and nearly all mines have had extended periods of exceedances in their permits. *Id.* at 13-14. The study also observed incomplete and inconsistent water quality monitoring, which can make detecting water quality degradation difficult. *Id.* at 14.

The Modern Mine Study similarly found that water quality predictions during environmental review were overoptimistic and underestimated actual impacts. *Id.* Dr. Chambers conceded, however, that the Modern Mine Study had not yet undergone peer review, but asserted that lack of peer review did not make the study's conclusions unreliable. *Id.*; Tr. Vol. 2 at 90-91, 107. This is relevant because Dr. Chambers also admitted he had recently published an article that

Environmental Impact Statements should include rigorous scientific peer review. Tr. Vol. 2 at 90-91.

DNR responds that these studies are not representative because they do not include any mines in Minnesota, nor any mines that are subject to Minnesota's mine siting and antidegradation rules. DNR A&E at 5; Tr. Vol. 2 at 87. Indeed, Dr. Chambers admitted he was unaware of the change to more stringent antidegradation rules in December 2016. Tr. Vol. 2 at 69-71. He also had not considered that permit reviews before December 2016 did not need to undergo antidegradation review but now must. *Id.* at 72-74.

DNR also notes that the Kuipers and Maest Study is twenty years old and involves mines that have been operating since the 1970s. DNR A&E at 5. As another point of contrast, DNR identifies that the mines in the Kuiper and Maest Study had an average financial assurance of $13 million, compared to the PolyMet/NorthMet mines–the only nonferrous metallic mineral mine permitted by DNR–which has financial assurance of over $1 billion. DNR Post-Hrg. Br. at 22. DNR asserts this difference is evidence that a nonferrous mine permitted in Minnesota will have more rigorous closure processes due to adequate funding, which will in turn reduce the risk of post-closure water quality violations. *Id.*

The Commissioner agrees these studies show some evidence in the abstract that environmental review is not perfect. But given the differences between the mines in those studies and any potential future nonferrous mine in the RRH watershed, the Commissioner gives less weight to these studies. Accordingly, the Commissioner does not agree that the evidence has established future environmental review and permitting decisions will be insufficient to protect water quality within the BWCAW. *See In re Excess Surplus Status of Blue Cross & Blue Shield of Minnesota*, 624 N.W.2d at 278 (noting that administrative agencies enjoy a presumption of

correctness); *Matter of MCEA for Commencement of an Env't Assessment Worksheet*, No. A20-1592, 2021 WL 4515335, at *3 (Minn. Ct. App. 2021).

In sum, the Commissioner recognizes the issues surrounding water quality were heavily contested. The parties submitted thousands of pages of testimony and record evidence. A series of expert witnesses testified on the topic during the eight-day contested case hearing. After extensive review, the Commissioner nevertheless concludes the deficiencies described above show that NMW has not met its burden of proving a MERA violation as applied to water quality. This conclusion is reinforced by a recognition that the ALJ is best positioned to make implicit credibility determinations when presented with conflicting expert testimony. *Vang v. A-1 Maint. Serv.*, 376 N.W.2d 479, 482 (Minn. Ct. App. 1985). To be clear, the Commissioner understands she owes no deference to the Recommendation. Rather, the Commissioner recognizes that when faced with conflicting expert testimony she was not present for, the ALJ's recommendation is indeed "entitled to some weight" and the agency will "not take lightly the ALJ's findings." *In re Grand Rapids Pub. Utilities Comm'n*, 731 N.W.2d at 870; *Bloomquist*, 704 N.W.2d at 190. Accordingly, having independently reviewed the record, the Commissioner agrees with the ALJ that NMW has not met its burden to establish that Minn. R. 6132.2000, in conjunction with water quality standards for the BWCAW, is inadequate to protect the waters of the BWCAW from pollution, impairment, or destruction.

C. NMW Has Established that Minn. R. 6132.2000 is Inadequate to Protect the BWCAW from Pollution, Impairment, or Destruction from Noise and Light.

As a preliminary matter, neither NWM nor DNR submitted any exceptions to the ALJ's Recommendation regarding noise or light. TMM submitted several arguments and exceptions on these matters, which were discussed in brief in many of the Commissioner's Findings of Fact and Conclusions of Law and are discussed in further detail here.

i. NMW's Expert Witness Was More Credible and Persuasive Than TMM's Expert Witnesses.

Like the water issues, the Commissioner recognizes the noise and light issues were contested and most of the evidence on these issues was offered by three experts: Dr. Kurt Fristrup testified as an expert on noise and light issues for NMW; Loïc Sauvageot testified as an expert on noise for TMM; and Brian Bylhouwer testified as an expert on light for TMM. The ALJ made specific findings on the credibility of Dr. Fristrup and Mr. Bylhouwer:

> [C]ontrary to the credible and useful testimony given by Dr. Fristrup regarding noise and light pollution, the testimony given by Mr. Bylhouwer was neither credible nor particularly useful. For example, Mr. Bylhouwer could not answer simple questions regarding the strength of headlights on a truck, the worst-case scenario for how far away vehicle lighting could be seen by the naked eye, or the worst-case scenario for the spatial extent of sky glow. Tr. Vol. 4 at 11-20 (Bylhouwer).

ALJ Memorandum at 56 n.463.

TMM asserts the ALJ's "difference in assessment of credibility also raises questions." TMM A&E at 2. TMM criticizes the Recommendation for

> failing to even mention that all of Dr. Fristrup's calculations presented in his pre-filed direct testimony had to be corrected on the eve of the contested case hearing because they grossly overstated the potential noise impact of a mine, and that Dr. Fristrup performed no mathematical analysis of potential light impacts at all.

Id. TMM contends Mr. Bylhouwer was asked a "series of incomplete, unrealistic, and scientifically unsupported hypotheticals" on cross-examination, which he was not able to meaningfully answer without more information. *Id.* at 2-3.

DNR responded that Dr. Fristrup's updated figures were more beneficial to TMM's argument and were subject to cross-examination by the parties. DNR E&A at 17-18. DNR asserts that on cross-examination, Dr. Fristrup provided credible and thorough testimony about the several types of light pollution that would be generated by mining activities, and his conclusion that a mine without control measures will degrade the BWCAW is reasonable. *Id.* at 18.

Again, the Commissioner understands she owes no deference to the ALJ's Recommendation and, when faced with conflicting expert testimony she was not present for, the Recommendation is "entitled to some weight" and the agency will "not take lightly the ALJ's findings." *In re Grand Rapids Pub. Utilities Comm'n*, 731 N.W.2d at 870; *Bloomquist*, 704 N.W.2d at 190. Having independently reviewed the Record, the Commissioner finds no reason to deviate from the ALJ's credibility findings concerning Dr. Fristrup and Mr. Bylhouwer as discussed further below.

Dr. Fristrup has significant experience in noise and light pollution and their effects on natural areas, particularly in the area of acoustics and bioacoustics. Fristrup Pre-Filed Direct at 2. For fifteen years in his capacity as Branch Chief for Science and Technology for the U.S. National Park Service's Natural Sounds and Night Skies Division, he assisted the National Park System in characterizing and managing the impacts of noise and light pollution in protected natural and recreational areas, during which time he studied the impact of light on people and animals. *Id.* He demonstrated a thorough understanding of these topics. Tr. Vol. 2 at 112-202; Fristrup Pre-Filed Direct, Ex. 8A (Fristrup Corrected Figures 3-9).

In contrast, Mr. Bylhouwer's experience is mainly in consulting and the assessment of outdoor environmental lighting at industrial facilities rather than natural areas. Bylhouwer Pre-Filed Direct at 3. As the ALJ noted, Mr. Bylhouwer seemed unable to answer basic questions about light pollution. Tr. Vol. 4 at 11-26.

The Commissioner agrees with DNR's analysis that Dr. Fristrup's corrections to his noise models were reasonable, and his explanations of his process for noise modeling were thorough and consistent with industry standards. He evaluated noise from three perspectives: the distance at which mining noise can be heard; the percentage of wilderness visitor predicted to be highly

annoyed by noise; and the loss of wilderness listening area (alerting distance) due to noise masking. Fristrup Pre-Filed Direct at 17. He used the industry standard algorithm for sound propagation—ISO 9613—and utilized data from mine noise sources from the PolyMet mine, environmental sound data from the U.S. Forest Service, weather data from the Ely Airport, and sound levels for mining equipment from the NorthMet mine and the Totten Mine in Canada. *Id.* at 15. His conclusions about the potential distance noise could propagate into the BWCAW were consistent with Minnesota Regional Copper Nickel Study and the federal government's Soundscape Report, and the DNR's finding. Tr. Vol. 2 at 136-139; Ex. 1 at DNR122981 at 95; J. Engstrom Pre-Filed Direct at 6; Fristrup Pre-Filed Rebuttal at 10.

The ALJ did not make an explicit credibility finding regarding TMM's witness for noise, Mr. Sauvageot. Mr. Sauvageot has extensive experience evaluating mine acoustics, monitoring mine acoustics, and implementing mitigation techniques. Sauvageot Pre-Filed Direct at 3-4. Mr. Sauvageot overall agreed that ISO 9613 was the appropriate algorithm, but he opined that Dr. Fristrup exaggerated the effect of temperature inversions. Sauvageot Pre-Filed Rebuttal at 3-5. However, he primarily criticized Dr. Fristrup for generalizing sound emitted from a mining site without accounting for a mine's specific location and design and technology available to mitigate impacts. *Id.* at 6. Mr. Sauvageot did not provide any competing models of the estimated noise impacts to the BWCAW from a nonferrous mineral mine in the RRH.

The Commissioner finds Mr. Sauvageot's testimony was less thorough and persuasive than Dr. Fristrup's, who provided ample evidence to support his inclusion of temperature inversions to overcome Mr. Sauvageot's criticisms. Tr. Vol. at 128-132; Fristrup Pre-Filed Direct at 27-28. And because this is a challenge to a regulation rather than a specific mine site, Dr. Fristrup's generalized estimates based on existing mine data and local weather were sufficient and reasonable to support

his estimates of the effect of noise pollution from a nonferrous mineral mine in the RRH on the BWCAW.

Similarly, Dr. Fristrup's opinions on light pollution were grounded in his decades of experience studying the effects of light pollution in remote areas, published research on the recreational value and ecological functions of dark skies, and his review and analysis of numerical modeling of night sky effects by the federal government that demonstrate how new mines within the RRH watershed will project light pollution into the BWCAW. Fristrup Pre-Filed Direct at 39-42. His conclusions were well-supported and reasonable.

Overall, and having independently reviewed the record, the Commissioner finds no reason to deviate from the ALJ's credibility findings regarding Dr. Fristrup and Mr. Bylhouwer and further finds Dr. Fristrup's testimony to be more persuasive than Mr. Sauvageot's.

ii. The Existing Regulatory Framework for Noise and Light Are Inadequate or Non-existent.

The parties agree noise pollution is governed by MPCA's rules, and that under these rules, the BWCAW would be categorized as either a Noise Area Classification 1 or a Noise Area Classification 4. Noise Area Classification 1 includes "Camping and picnicking areas (designated)," and this area can only exceed 60 decibels 50% of the time (day and night), and 65 decibels 10% of the time (night only). Minn. R. 7030.0040, subp. 2. Noise Area Classification 4 has no restrictions. Minn. R. 7030.0040, subp. 2. TMM contends the BWCAW has nearly 2,000 designated campsites that would be subject to Noise Classification Area 1. TMM A&E Reply at 9. DNR argues the BWCAW has not been "designated" a camping and picnicking area for this purpose. DNR A&E at 18.

Even if TMM is correct that any campsite in the BWCAW is subject to Noise Area Classification 1, the Commissioner finds this classification would not apply to the entire BWCAW

which, as a whole, is classified as wilderness—a type of area that is either subject to Noise Area Classification 4 (no restrictions) or unregulated, both of which are manifestly inadequate since they provide no limits for noise pollution in the BWCAW. Similarly, it is undisputed that there is no regulatory framework for light pollution to provide any kind of standard or restriction on light pollution entering the BWCAW, which is also manifestly inadequate. Tr. Vol. 4 at 37 (Bylhouwer); Fristrup Pre-Filed Direct at 4.

TMM nevertheless maintains the regulatory framework is adequate because DNR is not limited to MPCA's rules for noise pollution but may also address impacts through federal regulations, guidelines, or existing sound levels in a natural area on a case-by-case basis. TMM A&E at 5. For example, TMM's noise expert, Mr. Sauvageot, suggested the DNR could use the standard found in the Federal Hardrock Minerals Prospecting Permits Project, Record of Decision, which determined sound levels from exploratory drilling at the boundary of the BWCAW "may only exceed 30 dBA 50% of the time (L50 level of 30 dBA) and 35 dBA 10% of the time (L10 level of 35 dBA)" or "the level of a quiet woods setting." Ex. 1 at DNR058990-91.

However, the Commissioner determines that looking elsewhere for a standard only proves the existing regulatory framework for both noise and light is inadequate. Even TMM's experts agreed with NWM's expert that some kind of standard is necessary because, without it, there is no means by which to design, implement, and test mitigation techniques. Tr. Vol. 4 at 72, 92 (Sauvageot); Tr. Vol. 4 at 27 (Bylhouwer); Fristrup Pre-Filed Direct at 34. Therefore, while various mitigation techniques may be able to address noise and light pollution from nonferrous mineral mines on a case-by-case basis as discussed by TMM's experts, the techniques are meaningless without a standard by which to judge whether they are effective at protecting the wilderness. *See* Sauvageot Pre-Filed Direct at 17-18; Bylhouwer Pre-Filed Direct at 20-23.

Furthermore, if DNR adopted a standard from one of these other sources, even on a case-by-case basis, adopting an unofficial standard would likely constitute unpromulgated rulemaking. *See* DNR A&E at 18; Minn. Stats. §§ 14.02, subd. 4; 14.381. Therefore, the Commissioner concludes that adopting a standard from another source is not appropriate and merely illustrates the inadequacy of the current regulatory framework.

iii. The Existing Regulatory Framework is Inconsistent with the Wilderness Act.

The Wilderness Act defines a wilderness, in part, as "in contrast with those areas where man and his own works dominate the landscape" and an "area where the earth and its community of life are untrammeled by man." Wilderness Act, Pub. L. No. 88-577, § 2(c); 78 Stat. 890,891 (1964). It retains its "primeval character and influence" and "generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable." *Id.* The existing regulatory framework for noise and light pollution under the Mine Siting Rule are inconsistent with this definition because they would permit levels of pollution that are contrary to this definition.

The Commissioner determines the regulatory framework for noise pollution is inconsistent with this definition of wilderness under the Act because it does not preserve the BWCAW as an area where "the earth and its community of life are untrammeled by man" or "the imprint of man's work substantially unnoticeable." *Id*. Dr. Fristrup persuasively testified that mine noise will raise the background sound level, and for people who perceive this additional noise, it degrades their wilderness experience contrary to the Wilderness Act. Tr. Vol. 2 at 123-24. Additionally, if the entire BWCAW is subject to Noise Classification 1, which it is not, this standard would allow the noise equivalent of a loud restaurant in the BWCAW, which is, as the ALJ found, a "far cry from an untrampled wilderness area." ALJ Memorandum at 55. The Commissioner further concludes

that hearing the equivalent of a loud restaurant throughout the BWCAW would also certainly make the "imprint of man's work" substantially noticeable rather than unnoticeable. *See* 16 U.S.C. § 1131(c). Even TMM's expert, Mr. Sauvageot, agreed the noise equivalent of a loud restaurant was not consistent with the Wilderness Act. Tr. Vol. 4 at 78-79. Moreover, the majority of the BWCAW would likely have no noise standard applicable to it (Noise Area Classification 4), subjecting it to even higher sound levels that would be that much more inconsistent with its preservation as a wilderness area.

Similarly, the Commissioner concludes that since there are no regulatory standards for light pollution, there would be no limit on how much light pollution could impact the BWCAW. Dr. Fristrup testified that mining activity is likely to project enough light to be visible many miles inside the BWCAW boundary. Tr. Vol. 2 at 122. He added that "industrial sites like mines are brightly lit, no matter how well-directed the light is, a lot of light will be reflected off the ground into the sky and will create a prominent light dome." *Id.* at 143. This creates a visual marker of industrial activity that otherwise would not be there, diminishes night vision and the ability to see some stars, and can introduce shadows where there otherwise would not be any. *Id.* at 143-44. The Commissioner finds that the impacts described by Dr. Fristrup are inconsistent with the Wilderness Act because they will not preserve the wilderness character of the area, especially considering the extent of the impacts described by Dr. Fristrup currently have no limits. *See* Wilderness Act, Pub. L. No. 88-577, § 2(c).

TMM nevertheless argues that in finding the regulatory schemes for light and noise inconsistent with the Wilderness Act, the ALJ "appears to wrongfully characterize the general definition of wilderness" as "a blanket prohibition on any human activity inside – or outside – of a wilderness area which is noticeable within the wilderness area." TMM A&E at 8. In other words,

TMM argues the ALJ treated the definition of wilderness in the Act as a *per se* ban on all human activity.

In contrast, NMW argues the ALJ did not find Minnesota's noise regulations inconsistent with the Wilderness Act because they failed to ban all human activity; the ALJ concluded that Minnesota's noise regulations were inadequate to protect the BWCAW because they are not designed to protect wilderness at all. NMW A&E Reply at 16-17.

TMM is correct that the Wilderness Act does not impose a *per se* ban on all anthropogenic activity and the wilderness boundary of the BWCAW cannot be, essentially, expanded because anthropogenetic activities occurring outside of its boundary cannot have any effect on it. *Izaak Walton League of Am., Inc. v. Kimbell*, 516 F.Supp.2d 982, 989 (D. Minn. 2007), *judgment entered*, No. CIV. 06-3357 JRT/RLE (D. Minn. Jan. 11, 2008), *amended*, No. CV 06-3357 (JRT/RLE) (D. Minn. May 21, 2008), *aff'd*, 558 F.3d 751 (8th Cir. 2009) ("[T]he Court agrees with defendants that a *per se* ban on all agency activity having some impact on the adjoining the wilderness area would substantially impede its administration of wilderness areas, and could serve to expand the wilderness boundaries beyond the area established by Congress. An agency's duty under § 4(b) must take into account the fact that, at some point, the wilderness stops and civilization begins.").

However, as NMW correctly notes, the ALJ's Recommendation does not reference a *per se* ban on any impact from anthropogenic activity, and it is not by this standard that the regulatory framework for noise, and the lack of a framework for light, are rendered inconsistent with the Wilderness Act. Rather, what causes the regulatory framework for noise, and lack thereof for light, to be inconsistent with the Wilderness Act are their lack of any limitation on the pollution produced inside the BWCAW by anthropogenic activity (in this case, nonferrous mineral mining). Or, if

Noise Classification 1 is applied, the allowance of a sound level inside the BWCAW that is inconsistent with the Wilderness Act as explained above.

In a related argument, TMM criticizes the ALJ's Recommendation for "not meaningfully consider[ing] how the 'wilderness experience' varies for users depending on where a user is within the BWCAW." TMM A&E at 15. TMM contends that any factual finding "that infers a uniform wilderness experience for users throughout the BWCAW, without accounting for the man-made sounds that inevitably occur near the edge of the BWCAW, where airplanes and helicopters regularly fly overhead, motorboats are operated on lakes, and road traffic is regularly audible, and only consider the isolated interior of the BWCAW, is not in accordance with the clear record evidence." *Id.* at 16. The Commissioner infers from this argument that TMM believes additional noise from nonferrous mineral mining activities will not degrade the "wilderness experience" as much for users at the boundary of the BWCAW who are already used to hearing anthropogenic influences.

While certain areas of the boundary of the BWCAW may be exposed to more anthropogenic influences than the interior, the Commissioner finds the *entire* BWCAW is designed as wilderness and TMM has provided no legal argument for why the interior of the BWCAW should be distinguished from its boundary under the regulatory framework. Boundary Waters Canoe Area Wilderness Act, Public Law 95-495, 92 Stat. 1649 (1978). There is no mechanism in the regulatory scheme to, for example, apply Noise Classification 1 only to the BWCAW's boundary and a stricter standard to the interior.

That is not to say that subjective experiences may differ from users in areas with more existing anthropogenic activity. Dr. Fristrup acknowledged that research shows a general pattern of increasing sensitivity to noise for visitors who are farther from access points and it is probable

that visitors who perceive noise further from wilderness access points will be more heavily affected by noise. Fristrup Pre-Filed Direct at 19. But this is a factual and subjective consideration, not a legal consideration for how to apply the regulatory framework.

Moreover, as Dr. Fristrup explained, judging the impact of additional noise using existing baseline sound levels where noise is already louder has "the consequence that noise impacts would be judged to be less when the existing environment has more noise." *Id.* at 10. The new noise at an area like this might not stand out or be perceived against the existing noise, but considering the existing noise creates the problem of "shifting baselines" in which "management actions will not prevent unending erosion of resource conditions." *Id.* Thus, treating the boundary differently than the interior because it has more existing anthropogenic noise could cause a snowball effect in which more and more noise is allowed because the baseline shifts each time a new noise is added. The Commissioner finds this is not consistent with preserving the wilderness area.

iv. The *Schaller* Factors Weigh in Favor of Finding a MERA Violation.

The Minnesota Supreme Court adopted the *Schaller* factors to help determine if the conduct at issue in an alleged MERA violation results in a material adverse effect or is likely to result in a material adverse effect. *State by Schaller v. Cnty. of Blue Earth*, 563 N.W.2d 260, 267 (Minn. 1997). The five factors include:

> (1) The quality and severity of any adverse effects of the proposed action on the natural resources affected;
>
> (2) Whether the natural resources affected are rare, unique, endangered, or have historical significance;
>
> (3) Whether the proposed action will have long-term adverse effects on natural resources, including whether the affected resources are easily replaceable (for example, by replanting trees or restocking fish);
>
> (4) Whether the proposed action will have significant consequential effects on other natural resources (for example, whether wildlife will be lost if its habitat is impaired or destroyed);

> (5) Whether the affected natural resources are significantly increasing or decreasing in number, considering the direct and consequential impact of the proposed action.

Id. The court emphasized the factors are not exclusive and each one need not be met to find a material adverse effect. *Id.* The factors are a flexible guideline for consideration "as may be appropriate based on the factors of each case." *Id.* When determining if a material adverse effect will occur or is likely to occur, "something more than merely an adverse environmental impact" is required to trigger protection under MERA. *Id.* at 266.

TMM argues the ALJ misapplied four of the five *Schaller* factors. TMM A&E at 19. TMM's arguments in this regard for noise and light are very similar and are discussed together below.

a. Quality and Severity of the Adverse Effects.

TMM asserts the ALJ misapplied the first *Schaller* factor for two reasons. First, it argues her Recommendation was based on unreliable projections about speculative and theoretical impacts that are unsupported in the Record and rely on unfounded assumptions about how a modern mine would operate. TMM A&E at 20. Second, TMM asserts the evidence in the Record does not show that the speculative impacts would be severe. *Id.* at 23.

Very few published cases discuss the application of the *Schaller* factors. However, the published cases emphasize that the application of the factors is a balancing test and a fact-specific inquiry. Prior to the adoption of the *Schaller* factors, the Minnesota Supreme Court held:

> The Minnesota Environmental Rights Act does not prescribe elaborate standards to guide trial courts, but allows a case-by-case determination by use of a balancing test, analogous to the one traditionally employed by courts of equity, where the utility of a defendant's conduct which interferes with and invades natural resources is weighed against the gravity of harm resulting from such an interference or invasion.

Minnesota Pub. Int. Rsch. Grp. v. White Bear Rod & Gun Club, 257 N.W.2d 762, 782 (Minn. 1977). After the adoption of the *Schaller* factors, the Minnesota Court of Appeals held "the first factor instructs that severity is *relative* and must be weighed and analyzed." *State ex rel. Fort Snelling State Park Ass'n v. Minneapolis Park & Recreation Bd.,* 673 N.W.2d 169, 176 (Minn. Ct. App. 2003) (emphasis added). In a later unpublished case, *State ex rel. Friends of the Boundary Waters Wilderness v. AT&T Mobility, LLC*, the Court of Appeals found that "severe" means "unsparing or harsh; strict; very serious; grave or grievous." No. A11-1725, 2012 WL 2202984, at *4 (Minn. Ct. App. June 18, 2012).

Whether an alleged material adverse effect under MERA is too speculative in quality is likewise a fact-specific inquiry. In *Schaller*, the court determined the projected noise impacts of a traffic project were "simply too speculative" to survive a motion for summary judgment. *Schaller*, 563 N.W.2d at 268. More specifically, the court found the impact was too speculative because it was not projected to occur until 2010, the final EIS described the violation as "potential" rather than certain, the alleged violation assumed both that existing noise standards will be in force in 2010 and that the county would not be able to obtain a variance, and the noise projections were based on a four-lane highway when a two-way highway was being constructed. *Id.* at 268-67.

In contrast, in *State by Smart Growth Minneapolis v. City of Minneapolis*, the Minnesota Supreme Court determined the City of Minneapolis's proposed 2040 Comprehensive Plan, despite the possibility it could be amended and might not be built out, was not too speculative and survived a motion to dismiss under Rule 12.02(e) of the Minnesota Rules of Civil Procedure. 954 N.W.2d 584 (Minn. 2021).

While the procedural postures of *Schaller* and *Smart Growth* were not the same, and also differ from the posture of this case, they demonstrate that what is too speculative in one case may

not be too speculative in another. A distinction that can be made between the cases is that *Schaller* dealt with a specific project and *Smart Growth* dealt with a plan. *Schaller*, 563 N.W.2d at 268; *Smart Growth*, 954 N.W.2d 584.

TMM argues "[t]he [Recommendation's] conclusions about the likelihood and magnitude of potential noise and light impacts were not supported by the record evidence, and based on assumptions about hypothetical mines that are not reflective of every – or any – particular mine that may be built in the RRHW." TMM A&E at 20. TMM refers to the ALJ's findings that mining "can propagate noise tens of miles past the boundary into the BWCAW" and "can project enough light to be visible many miles into the BWCAW," which were based upon Dr. Fristrup's testimony. ALJ Findings 215, 218.

As to noise, TMM criticizes Dr. Fristrup's models for estimating noise using exclusively gas and diesel-powered equipment, all simultaneously operating at full power from an open-pit mine, above ground, and at the same location. TMM A&E at 20. TMM argues his noise propagation models were rudimentary, ignored attenuation from vegetation, and exaggerated by modeling strong temperature inversions. *Id.*

As to light, TMM argues Dr. Fristrup presented "bald claims about the distance lighting from mining might be visible in the BWCAW." *Id.* at 21. TMM criticizes Dr. Fristrup's conclusion on the ground it was based on an untested assumption rather than a mathematical or scientific analysis of actual impacts of a hypothetical mine. *Id.*

NMW counters that Dr. Fristrup's noise modeling is not "theoretical" simply because it is not directed at one particular mine project in the RRH watershed. NMW A&E Reply at 10. Indeed, NMW notes that Dr. Fristrup's model used noise data from equipment modeled for the PolyMet EIS and accounted for different configurations at different mines by modeling the impacts of

individual noise sources—such as truck traffic, exhaust fans, blasting, and operational noise. *Id.*; Tr. Vol. 2 at 125-127 (Fristrup). NMW argues Dr. Fristrup explained how strong inversions should be part of any reputable noise propagation model because they occur in 25% of all nighttime hours, and his model did account for attenuation from vegetation, which he concluded would have a "negligible effect" on the distance that mining noise would be audible in the BWCAW. NMW A&E Reply at 10; Tr. Vol. 2 at 128-129, 159, 167-68 (Fristrup). Finally, NMW notes that Dr. Fristrup's modeling results are in line with projections in the Minnesota Regional Copper Nickel Study, the federal government's Soundscape Report, and by DNR. Tr. Vol. 2 at 136-139 (Fristrup); Ex. 1 at DNR122981 at 95; J. Engstrom Pre-Filed Direct at 6:107-110; Fristrup Pre-Filed Rebuttal at 10.

Regarding light, NMW counters that Dr. Fristrup's opinions on light pollution are not guesswork but are "grounded in Dr. Fristrup's decades of experience studying the effects of light pollution in remote areas, published research on the recreational value and ecological functions of dark skies, and his review and analysis of numerical modeling of night sky effects by the federal government that demonstrate how new mines within the RRH watershed will project light pollution into the BWCAW." NMW A&E Reply at 11; Fristrup Pre-Filed Direct at 39-42. NMW further points out Dr. Fristrup opined that no matter how well-directed the light is or how much mitigation is used, light from a brightly lit mine near the BWCAW will reflect off the ground and into the sky and "create a prominent light dome." NMW A&E Reply at 11; Tr. Vol. 2 at 143 (Fristrup). NMW argues light pollution from even minimal light domes will materially impact BWCAW visitors' ability to see and experience the night skies and threaten the BWCAW's rare dark sky sanctuary status. NMW A&E Reply at 11; Fristrup Pre-Filed Direct at 41-42, 44; Fristrup Pre-Filed Rebuttal at 17-18, 24-25; Tr. Vol. 2 at 143-145 (Fristrup).

The Commissioner finds TMM's arguments are unpersuasive and NMW's arguments are persuasive and supported by the Record. The Commissioner concludes that the ALJ's findings and conclusions regarding noise and light are not based on evidence that is too speculative or theoretical to satisfy the first *Schaller* factor. Analyzing the quality of the alleged impacts from noise and light in the context of the facts here, it is necessary to recognize this is a challenge to a regulation, not a particular mine or project. *See Schaller*, 563 N.W.2d at 267 (holding the factors are a flexible guideline for consideration "*as may be appropriate based on the factors of each case*" (emphasis added)). Thus, the likelihood of any adverse effects must be based upon a hypothetical mine that could be located anywhere in the RRH. Accordingly, the Commissioner agrees with NMW's arguments that Dr. Fristrup's noise modeling is not "theoretical" simply because it is not directed at one particular mine project in the RRH watershed.

Additionally, contrary to TMM's assertions, it cannot be assumed that a hypothetical mine will utilize all design and mitigation strategies available to a modern mine when to do so is not required by the existing regulatory scheme. The hypothetical mine may use electric equipment, but it may not. Dr. Fristrup's use of gas and diesel equipment and other inputs without incorporating noise and light mitigation techniques is reasonable when mitigation is not required. Indeed, the question here is whether the Mine Siting Rule protects the BWCAW from the adverse effects of noise and light pollution. So, it is most reasonable to consider the worst-case scenario allowed by the regulatory scheme, which in this regulatory framework for both noise and light is no standard (non-existent regulation for light and Noise Classification 4 or unregulated noise for wilderness areas). *See*, *e.g.*, *Smart Growth,* 954 N.W.2d at 595 (rejecting the argument that a MERA challenge is only appropriate when a specific, discrete project is approved or that reliance on the assumption of a full build-out is too tenuous).

The Commissioner further finds that Dr. Fristrup's modeling and conclusions regarding noise and light were credible and based upon sound scientific methods, reasoning, and research. His opinions demonstrated that while the scope of the impact of noise and light from a hypothetical nonferrous mineral mine in the RRH cannot be accurately predicted because there are variables at play like mine location and design, an adverse impact is certain. *Cf. Schaller*, 563 N.W.2d at 267-68 (finding noise impact from a proposed highway project were too speculative, in part, because they were "potential" and not "certain"). In particular, Dr. Fristrup opined, to a reasonable degree of scientific certainty, that "it is certain that mining in the RRH will regularly project sufficient noise and light to alter wildlife behavior and adversely affect recreational visitor experience in the BWCAW." Fristrup Pre-Filed Direct at 3. He found that under regularly occurring conditions, noise could propagate tens of miles past the boundary of the BWCAW, and noise was "likely to be audible in the Wilderness regardless of mine configuration" because based on the physics of moving ore and air, no "facility that processes 10,000 tons of ore a day" in the RRH watershed could fail to produce noise that would reach the BWCAW boundary. Tr. Vol. 2 at 122, 158-24 (Fristrup). Dr. Fristrup's modeling showed an impact based on individual machines running at a mine and did not rely on the consolidated effect of all machinery running at once although that would increase the adverse impact. *Id.* at 158-59; Ex. 8A, Figures 3 & 4.

As to the magnitude of the sound entering the BWCAW, that would again vary based on mine location and design. Nevertheless, as part of his modeling, Dr. Fristrup determined noise entering the BWCAW would be "highly annoying" to approximately 1% of visitors inside the boundary under normal conditions and under a strong temperature inversion the annoyance would penetrate further. Tr. Vol. 2 at 166; Ex. 8A, Figures 5 & 6. However, Dr. Fristrup explained that while the percentage of highly annoyed people can be informative, it is not a relevant criteria for

wilderness areas. Tr. Vol. 2 at 191-192. He explained the U.S. Park Service considers annoyance and may not want a single person to be "highly annoyed," but audibility and the loss of listening area for wildlife are the important criteria for impacts to natural areas like the National Park System. *Id.* at 191-94; Fristrup Pre-Filed Direct at 14. In this instance, he projected a hypothetical mine in the RRH could be audible as far as 25 miles into the BWCAW under strong temperature inversions, and "[t]he audibility – meaning mere perception – of mine noise in wilderness will degrade the experience of most visitors." Tr. Vol. 2 at 123; Fristrup Pre-Filed Direct at 19.

Regarding light, Dr. Fristrup specifically concluded that sky glow from a mine in the RRH would cause material adverse impact to the BWCAW's night sky and could jeopardize the BWCAW's status as a Dark Sky International Sanctuary. Fristrup Pre-Filed Direct at 34-35. He persuasively opined that "no matter how well-directed the light is, a lot of light will be reflected off the ground into the sky and will create a prominent light dome on the horizon," which will be a marker of industrial activity in the sky, diminish night vision, and eliminate the visibility of some small stars. Tr. Vol. 2 at 143 (Fristrup).

Turning to the severity of the adverse effects from noise and light, TMM cites the Court of Appeals' decision in *Friends of the Boundary Waters Wilderness* to argue the effects here are not severe because the record does not provide evidence of the specific scope and magnitude of the adverse effects of noise and light on the BWCAW. No. A11-1725, 2012 WL 2202984 (Minn. Ct. App. June 18, 2012). TMM references the Court of Appeals' conclusion that construction of a 450-foot-tall wireless communications tower 1.5 miles outside of the BWCAW would not have a severe adverse effect, because "less than fifty percent of the proposed tower will be visible from less than one percent of the BWCAW's 1,175 lakes." *Id.* at *6.

The Commissioner finds *Friends of the Boundary Waters Wilderness* is distinguishable from the present matter. *Friends of the Boundary Waters Wilderness* challenged a *specific project* located outside the BWCAW—*one cell tower*—rather than a regulation and the adverse effect of a whole mine operating under the regulations on the BWCAW. Therefore, the Commissioner does not find TMM's argument based upon this decision to be persuasive.

Here, the Commissioner finds the adverse effects of noise and light from a nonferrous mineral mine operating in the RRH are severe. Hardrock mining operations can run twenty-four hours a day for years. Ex. 1 at DNR122986, 91. Dr. Fristrup explained that noise from mining would raise background sound levels, effectively deafening organisms trying to hear in that environment and degrading the wilderness experience. Tr. Vol. 2 at 123-124. He testified that during strong temperature inversions, mine noise could be intense enough at the BWCAW boundary to interfere with conversational speech, which is a "very severe impact." *Id.* at 145-146. The Commissioner finds that these are severe adverse effects from noise relative to the context of a wilderness area like the BWCAW. *See Fort Snelling,* 673 N.W.2d at 176 (holding "the first factor instructs that severity is *relative* and must be weighed and analyzed" (emphasis added)). The Commissioner similarly finds that the potential loss of the BWCAW's Dark Sky Sanctuary status and the creation of a light dome that would worsen the sky quality of the BWCAW and diminish night vision and impair the viewing of stars is a severe effect. *See id.*

Overall, the Commissioner concludes that the quality and severity of the adverse effects from noise and light pollution from a hypothetical nonferrous mineral mine on the BWCAW weigh in favor of finding the first *Schaller* factor is met.

b. Long-term Adverse Effects.

TMM takes exception to the ALJ's conclusion that the third *Schaller* factor is met. TMM contends that any adverse impact from noise and light cannot be considered a "long term adverse

effect" because noise and light emissions disappear immediately once a machine generating noise or a fixture generating light are turned off. TMM A&E at 24. TMM cites to *State ex rel. Fort Snelling State Park Association v. Minneapolis Park & Recreation Board* for the proposition that adverse effects are not necessarily "long-term," even if a structure or activity is expected to last for decades, like mining, where removal of the structure or cessation of the activity can return the natural resource to its original condition. *Id.* at 24 (citing 673 N.W.2d 169, 176 (Minn. Ct. App. 2003)).

NMW counters that mining noise will also have significant, long-term impacts on wildlife. NMW A&E Reply at 13. NMW cites to Dr. Fristrup's testimony that over longer time scales, noise can drive wildlife from otherwise suitable habitat—like BWCAW—and recolonization of the original habitat may not happen for years after the noise is finally removed. Fristrup Pre-Filed Direct at 34. Dr. Fristrup also explained that "though sky glow will disappear shortly after the lights are extinguished, the ecological effects from lighting could persist for months or years," especially for nocturnal flying insects. *Id.* at 39. Light pollution can substantially alter nocturnal ecological processes, disrupting predator-prey interaction, pollination, and other behaviors mediated by visual performance at night. *Id.* at 40. In Dr. Fristrup's expert opinion, the consequences of light pollution could take years to resolve once the light is removed. *Id.* at 39.

TMM's reliance on *Fort Snelling* is misplaced. In that case, the court determined that a structure to be added to a polo ground, once removed, would return the grounds to their original space and have no long-term impacts. 673 N.W.2d at 176. There was no mention, however, of any lingering effects from the structure's placement after removal. In contrast, as NMW points out, the Record contains ample credible testimony from Dr. Fristrup that even after the noise and light generated from a nonferrous mineral mine in the RRH ceases, the environment will not return to

its prior state. Rather, the impacts to ecological system, including wildlife, will linger and be long-term. The Commissioner finds no reason to depart from the ALJ's conclusion and finds the third *Schaller* factor is met.

c. Significant Consequential Effects on Other Natural Resources.

TMM argues the fourth *Schaller* factor is not met because the ALJ relied on generalized and speculative testimony for Conclusion of Law 27 in her Recommendation, which states:

> The ecological effects from light pollution can persist for months or years. Nocturnal insects may develop different sensory and behavioral traits in response to light pollution, and nocturnal bird migration may also be affected. Plant physiology may be altered and nocturnal ecological processes can be completely disrupted by light pollution.

The ALJ's conclusion was based on Dr. Fristrup's testimony, and TMM argues his "claims about the ecological effects of light pollution were generalized and speculative, and not based on analysis of any specific insects or birds found in the RRHW, or any specific plants." TMM A&E at 24-25. Citing, again, to the unpublished case *Friends of the Boundary Waters Wilderness*, TMM argues that potential impacts on animals are insufficient to establish a material adverse effect where the evidence did not "quantify how many of which species of birds" would be impacted and does not "determine how significant this effect will be." 2012 WL 2202984, at *7. TMM further argues the Record evidence shows that noise levels below 40 dB(A) have only limited impacts on wildlife and the level of noise that will affect wildlife varies based on species and the type of noise.

In contrast, NMW asserts that MERA does not require the kind of "granularity" in the effects on other resources as asserted by TMM. NMW A&E Reply at 14. NWM cites to *Freeborn County by Tuveson v. Bryson*, which did not require plaintiffs to quantify how many of each animal species would likely suffer from the proposed action to make a prima facie showing under MERA. 210 N.W.2d 290, 293 (Minn. 1973).

As the Commissioner previously noted, the Commissioner does not find *Friends of the Boundary Waters Wilderness* to be persuasive in this case because it dealt with a specific project, not a regulation. The Commissioner also finds that quantifying specific effects on other natural resources—in this case wildlife and ecological systems—is likewise inappropriate under the facts here. *See Schaller*, 563 N.W.2d at 267 (holding the factors are a flexible guideline for consideration "*as may be appropriate based on the factors of each case*" (emphasis added)). It would be unreasonable to quantify population losses for specific species here because this is a challenge to a regulation, not a challenge to a specific mine in a specific location with known species in its vicinity. Thus, the approach taken in *Freeborn County*, is more applicable. In *Freeborn County,* the court concluded in a condemnation action that it was sufficient that "[t]he expert witnesses all stated their opinion that the construction of the proposed highway would have a significant detrimental effect on the marsh area's value as a wildlife area because it would eliminate some of the area's natural assets, destroy the quietness and solitude of the marsh, increase animal and bird fatalities, and have other adverse effects." 210 N.W.2d at 293. The more generalized impacts considered in *Freeborn County* are likewise more appropriate to consider here.

The Commissioner concludes TMM's argument is unpersuasive and the Record evidence, although more generalized as to the significant consequential impacts to wildlife, weighs in favor of finding the fourth *Schaller* factor has been met.

d. Significant Increase or Decrease in Affected Natural Resources.

As to the fifth *Schaller* factor, TMM argues the ALJ did not undertake the relevant inquiry. TMM A&E at 26. The ALJ's Recommendation concludes that "wilderness areas in the United States are shrinking and subject to increasing pressures due to climate change and increases in

population." ALJ COL 14. TMM asserts that the proper inquiry is whether the darkness or quietude of the BWCAW is significantly increasing or decreasing. TMM A&E at 26.

The Commissioner finds the affected natural resource at the heart of this case is the BWCAW, and the ALJ's conclusion is a correct application of the fifth *Schaller* factor.

e. Balancing the Factors.

Considering all the *Schaller* factors together, the Commissioner concludes that while not all factors need be met to show a material adverse effect under MERA, the balance of the evidence weighs towards finding all factors have been met in this case. *Schaller*, 563 N.W.2d at 267. Accordingly, the Commissioner concludes NMW has shown by a preponderance of the evidence that noise and light pollution from nonferrous mineral mining in the RRH is likely to have material adverse impact on the BWCAW.

IV. Conclusion

For the reasons above, including the Findings of Fact and Conclusions of Law from the ALJ that have been adopted by the Commissioner, a preponderance of evidence establishes that Minnesota Rule 6132.2000 combined with the water quality standards for the Boundary Waters Canoe Area Wilderness is adequate to protect the waters of the BWCAW from pollution, impairment, or destruction (as defined in Minn. Stat. § 116B.02, subd. 5) arising from nonferrous metallic mineral mining in the Rainy River Headwaters watershed. The Commissioner concludes, however, that a preponderance of the evidence shows Minnesota Rule 6132.2000 is inadequate to protect the BWCAW from pollution, impairment, or destruction associated with noise and light impacts arising from nonferrous metallic mineral mining in the RRH watershed. The Commissioner therefore adopts the ALJ's Recommendations and, subject to a party's right to seek judicial review of this final agency decision, shall initiate a rulemaking proceeding to amend

Minnesota Rule 6132.2000 or promulgate a new rule to sufficiently protect the BWCAW from noise and light pollution arising from nonferrous metallic mineral mining in the RRH watershed.[2]

[2] TMM asserts that DNR lacks statutory authority to regulate noise and light pollution for nonferrous metallic mineral mines. TMM A&E at 30-31. The parties stipulated on December 15, 2023, however, that the issue of remedy will be addressed at a future stage of this proceeding and is therefore not at issue in this final agency decision. The scope of DNR's authority to regulate noise and light may be addressed in the subsequent rulemaking proceedings.