

**MINNESOTA  
DEPARTMENT OF NATURAL RESOURCES**

*In the Matter of the NorthMet Project Permit to Mine Application*

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**POLY MET MINING, INC.'S PRINCIPAL BRIEF  
REGARDING THE ADMINISTRATIVE LAW JUDGE'S  
FINDINGS OF FACT, CONCLUSIONS OF LAW,  
AND RECOMMENDATION**

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## INTRODUCTION

The Administrative Law Judge in this case recommended in favor of PolyMet and DNR on the specific fact disputes that he was asked to resolve. He found that bentonite can be successfully applied to the tailings basin sides, beaches, and pond bottom; that bentonite would be effective in maintaining a permanent pond in the basin; that cation exchange would not render the bentonite ineffective; and that bentonite would remain effective over time. All those findings rest on substantial evidence. Yet, purely on legal grounds, the ALJ recommended that DNR deny PolyMet's permit to mine application. That recommendation rests on a misreading of Minnesota's Reactive Mine Waste Rule ("the Rule").

The Rule's plain language allows PolyMet's tailings management plan. That language offers two options for permit applicants: (1) storing the waste "in an environment" where it is "no longer reactive" or (2) "permanently prevent[ing] substantially all water from moving through or over" the waste while collecting and disposing of "any remaining residual waters that drain from the mine waste . . . ." Minn. R. 6132.2200, subp. 2(B). PolyMet's tailings basin meets either option—the first by pairing bentonite amendments with a seepage capture system that prevents the tailings from harming the environment, and the second by retaining more than 99% of the water in the system and collecting any water that escapes.

The ALJ misread the rule's options. In addressing the first option, the ALJ was so focused on arguments about water quality standards—which are not part of the rule—that he ignored the larger environment in which NorthMet Project tailings will be stored. Similarly, the ALJ found the rule's second option unmet because he fixated on the total volume of water that would leave the tailings basin, even though the rule limits only the proportion of water that can leave. As long as most of the

water stays in the tailings basin—as the facts show that it will—and residual water is captured, the rule’s second option is satisfied.

Given the evidence in the contested case and the Rule’s plain language, the Commissioner’s Designee’s final decision in this contested case should affirm the ALJ’s factual findings and hold that PolyMet’s plans comply with the Rule.

### **FACTUAL AND PROCEDURAL BACKGROUND**

PolyMet wants to build Minnesota’s first copper-nickel-precious metals mine: the NorthMet Project. The project sits in the Iron Range, which has been producing taconite and iron ore for more than a century. Indeed, PolyMet plans to reuse processing facilities that were once home to the LTV Steel Mining Company.<sup>1</sup> The NorthMet Project’s processing will produce the target minerals, as well as “tailings”—finely ground rock that lacks recoverable amounts of the target minerals.<sup>2</sup> These tailings will “be deposited in an upgraded existing tailings basin” at the plant site and covered with a pond.<sup>3</sup> PolyMet plans to construct dams around the perimeter of this tailings basin<sup>4</sup> and apply a bentonite amendment—i.e., a mix of tailings and bentonite—in three places: (1) the exterior face of the dams,<sup>5</sup> (2) the exposed “beach” between the dam crest and water line,<sup>6</sup> and (3) if the basin cannot maintain a permanent pond without bentonite, the pond bottom.<sup>7</sup>

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<sup>1</sup> OAH Official Record, OAH 60-2004-37824 PolyMet Official Record (“OAH Record”), at 14967, DNR Order for Prehearing Conference & Hearing (Sept. 24, 2021), ¶ 2.

<sup>2</sup> OAH Record at 14967, ¶ 2.

<sup>3</sup> OAH Record at 14967, ¶ 2.

<sup>4</sup> OAH Record at 14967, ¶¶ 3–4.

<sup>5</sup> Ex. 219 at 0115626, ¶¶ 534–35.

<sup>6</sup> Ex. 219 at 0115626, ¶¶ 534–36.

<sup>7</sup> Ex. 219 at 0115626, ¶¶ 534, 537, n.19.

At the Minnesota Supreme Court’s direction, these bentonite applications were reviewed in a contested case. *Matter of NorthMet Project Permit to Mine*, 959 N.W.2d 731, 754 (Minn. 2021). But bentonite is only part of PolyMet’s tailings management plan. The plan also includes other engineering controls to ensure that its tailings storage facility meets the Rule. For example, seepage from the tailings basin will be collected by a seepage containment system that is “keyed to bedrock.”<sup>8</sup> That collected seepage will then be pumped back into the tailings basin pond or sent to PolyMet’s water treatment system.<sup>9</sup> Monitoring will “ensure compliance with the design requirements for reactive mine waste storage facilities.”<sup>10</sup> And PolyMet will use mechanical treatment for collected seepage “as long as necessary.”<sup>11</sup> The tailings basin, seepage containment system, and water treatment system are all part of the NorthMet Project’s Flotation Tailings Management Plan.<sup>12</sup> Under this tailings management plan, seepage from the basin—including seepage from past taconite operations—will be collected and treated.<sup>13</sup>

The non-bentonite aspects of PolyMet’s tailings management plan were not part of the contested case hearing because the Supreme Court declined to order such a hearing on any of “the other factual issues raised” by Petitioners, including issues “not specifically raised in the briefs.” *Id.* at 738, 750 n.13. The Court expressly rejected a hearing on the “tailings basin” or “tailings waste storage facility,” “seepage containment technologies,” the “adequacy of the proposed monitoring wells at the

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<sup>8</sup> Ex. 219 at 0115578 ¶ 230.

<sup>9</sup> Ex. 210 at 0065583.

<sup>10</sup> Ex. 219 at 0115580, ¶¶ 238, 240.

<sup>11</sup> Ex. 219 0115656–57, ¶ 696.

<sup>12</sup> Ex. 214 at 0067111, 0067117.

<sup>13</sup> Ex. 212 at 0066800, 0066803–807.

site,” and the “adequacy of the permit.” *Id.* at 742 n.11. The Court even declined to order a hearing on some bentonite issues, such as whether bentonite is an “available technology” and whether the bentonite amendment would “impact the stability of the tailings basin dam.” *Id.* at 752–54.

Applying the Supreme Court’s holdings, DNR ordered a contested case hearing on whether the proposed bentonite amendment is a “practical and workable” reclamation technique that will reduce infiltration of oxygen and water into the stored tailings and satisfy the Rule.<sup>14</sup> DNR’s order specifically referred five fact disputes,<sup>15</sup> and emphasized that all “[o]ther issues raised by the Petitioners are specifically *excluded* from this contested case hearing.”<sup>16</sup>

The Administrative Law Judge held a hearing on the five fact disputes.<sup>17</sup> Afterward, the ALJ made recommended findings of fact and proposed conclusions of law. Under Minnesota Statutes section 14.61, subdivision 1, the Commissioner’s Designee has now asked the parties to file written exceptions and argument before making a final decision. PolyMet thus submits this principal brief.

## ARGUMENT

### **I. The ALJ’s findings of fact on bentonite’s effectiveness were based on substantial evidence and should be affirmed.**

The primary purpose of a contested case hearing is to find facts. Indeed, a reviewing court must uphold an agency’s final decision unless the decision “is

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<sup>14</sup> OAH Record at 14352–53, DNR Amended Notice & Order for Hearing Conference & Hearing (Feb. 14, 2022), ¶ 26.

<sup>15</sup> OAH Record at 14352–53, ¶ 26.

<sup>16</sup> OAH Record at 14349–50, ¶¶ 14, 17 (emphasis added).

<sup>17</sup> OAH Record at 8–9, Findings of Fact, Conclusions of Law (Nov. 28, 2023) (“ALJ report”) at 2–3).

unsupported by substantial evidence.” Minn. Stat. § 14.69(e). This “substantial-evidence analysis” requires courts to “determine whether the agency has adequately explained how it derived its conclusion and whether that conclusion is reasonable on the basis of the record.” *Permit to Mine*, 959 N.W.2d at 749. So long as an agency’s decision satisfies these requirements, “it must be affirmed.” *Id.*

The hearing record contains substantial evidence supporting the conclusion that bentonite will be effective. Three witnesses for PolyMet offered such evidence. Two of those witnesses, Tom Radue<sup>18</sup> and John Hull,<sup>19</sup> testified that bentonite can be applied to the basin sides, beaches, and pond bottom to ensure its effectiveness in reducing oxygen and water infiltration into the stored tailings over time. The third witness, Tamara Diedrich<sup>20</sup> testified that the chemical makeup of water at the basin will not undermine bentonite’s effectiveness. These witnesses’ testimony was credible and consistent with DNR’s findings when it issued the permit to mine. For their part, Petitioners failed to carry their burden of persuasion, which required them to prove that the bentonite amendments would *not* be effective.<sup>21</sup> Thus, the ALJ’s factual findings on bentonite’s effectiveness should be affirmed.

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<sup>18</sup> Ex. 74 at 392–405, 588–592, 808–820, 929–943, 1003–1007, 1142–1147 (Radue Direct); Ex. 75 at 177–614 (Radue Rebuttal); Tr. Vol. 2 at 98:1–22, 100:1–3 (Radue); see *also id.* at 948–1644.

<sup>19</sup> Ex. 76 at 64–75, 100–176, 433–447, 471–488 (Hull Direct); Ex. 77 at 180–588 (Hull Rebuttal); see *also id.* at 709–802; Tr. Vol. 2 at 129:9–13 (Hull); Tr. Vol. 3 at 9:3–22, 20:1–21:14 (Hull).

<sup>20</sup> Tr. Vol. 3 at 32:10–34:10, 110:12–17 (Diedrich); Ex. 78 at 75–96, 423–432 (Diedrich Direct); Ex. 79 at 178–197, 224–227 (Diedrich Rebuttal).

<sup>21</sup> The ALJ correctly determined that Petitioners bear the burden of proving, by a preponderance of the evidence, that the issue and the five specific fact disputes should be resolved against PolyMet and DNR. OAH Record at 31, ¶ 4, ALJ report at 25, ¶ 4.



**A. Bentonite can be successfully applied to the basin sides, beaches, and pond bottom to ensure its effectiveness.**

The ALJ recommended finding that the bentonite amendment can be successfully applied to the basin sides, beaches, and pond bottom to reduce infiltration of oxygen and water into the stored tailings over time.<sup>22</sup> Because that recommendation was supported by substantial evidence, it should be affirmed.<sup>23</sup>

**I. Bentonite can be applied to the basin sides and will be effective.**

To start, the evidence showed that a bentonite amendment can be applied to the basin sides using “standard construction processes.”<sup>24</sup> Indeed, many general earthwork contractors already have the necessary equipment and capabilities to install the bentonite amendment.<sup>25</sup> That is why no one at the hearing seriously disputed that the bentonite amendment can be installed on the basin sides.<sup>26</sup> As even one of Petitioners’ witness admitted, “a bentonite-tailings layer can be constructed in [the] manner” that PolyMet proposes.<sup>27</sup>

The bentonite amendment on the basin sides also will achieve performance expectations. Those expectations are based on the modeled hydraulic conductivity rate for the basin sides. Hydraulic conductivity—also known as permeability—is the rate at which water passes through a medium. The smaller the number, the lower

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<sup>22</sup> OAH Record at 9, 32–33, ALJ report at 3, 26–27.

<sup>23</sup> OAH Record at 15–19, 32–33, ALJ report at 9–13, 26–27.

<sup>24</sup> Ex. 74 at 406–423, 590–592 (Radue Direct); *see also* Ex. 76 at 103–107 (Hull Direct); Ex. 77 at 87–105 (Hull Rebuttal).

<sup>25</sup> Ex. 74 at 534–540 (Radue Direct).

<sup>26</sup> Tr. Vol. 3 at 16:19–17:17 (Hull); Ex. 76 at 433–447 (Hull); Ex. 200 at 15: 1–10 (Malusis Direct); Ex. 202 at 28:2–3 (Kuipers Direct).

<sup>27</sup> Ex. 200 at 15:9–10 (Malusis Direct); *see* Tr. Vol. 4 at 57:17–19 (Malusis).

the hydraulic conductivity, and the longer it takes for water to pass through.<sup>28</sup> Here, the modeled hydraulic conductivity for the basin sides was  $5.56 \times 10^{-6}$  cm/sec.<sup>29</sup> An independent laboratory test showed that the 3% bentonite-amended LTV coarse tailings proposed for use on the basin sides will achieve this modeled hydraulic conductivity. In fact, that test of 3% bentonite-amended LTV coarse tailings showed a hydraulic conductivity rate of  $1.8 \times 10^{-7}$  cm/sec<sup>30</sup>—more than *30 times lower* than the modeled rate.<sup>31</sup> No other testing was needed, given the other information available about the tailings.<sup>32</sup>

## **2. Bentonite can be applied to the beaches and will be effective.**

The hearing evidence also showed that a bentonite amendment can be successfully applied to the beaches. Experts testified that construction contractors can work in conditions more challenging than those anticipated on the NorthMet

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<sup>28</sup> Tr. Vol. 1 at 44:13–17 (Radue); Tr. Vol. 2 at 111:15–16 (Radue); Ex. 75 at 213–215 (Radue Rebuttal).

<sup>29</sup> Tr. Vol. 1 at 44:23–45:2, 46:2–6 (Radue); Tr. Vol. 2 at 58:21–59:4 (Radue); Tr. Vol. 3 at 88:4–10 (Diedrich); Ex. 75 at 223–225, 274–275 (Radue Rebuttal).

<sup>30</sup> Tr. Vol. 1 at 62:20–63:6 (Radue); *see also id.* at 39:12–21; Tr. Vol. 2 at 110:11–111:19 (Radue); Ex. 74 at 327–336 (Radue Direct); Ex. 75 at 252–259, 291–294 (Radue Rebuttal); Ex. 16.

<sup>31</sup> Ex. 75 at 291–296 (Radue Rebuttal); Ex. 16.

<sup>32</sup> *See* Tr. Vol. 3 at 210:12–15 (“it’s important to take into consideration the many dozens of others of hydraulic conductivity values that were tested with the existing materials that are out there”), 211:9–10 (“there’s a lot more than just one hydraulic conductivity value that’s been measured”), 211:22–23 (“there are all kinds of different hydraulic conductivity tests that were run of materials”), 213:13–16 (“There’s a geometric mean that’s calculated for the slime. There’s a geometric mean that’s calculated for the coarse LTV tailings.”) (Wenz); Ex. 25; Ex. 26; *see also* Ex. 74 at 331–336 (Radue Direct); Ex. 16.

Project beaches.<sup>33</sup> And while Petitioners' witnesses questioned how the bentonite amendment would be applied, Petitioners failed to carry their burden.<sup>34</sup> Even if Petitioners' witnesses had not personally seen such an approach, the evidence showed that any challenges with the basin beaches "can readily be overcome."<sup>35</sup>

Once installed, the bentonite amendment on the basin beaches will achieve performance expectations.<sup>36</sup> The beaches, like the basin sides, have a modeled hydraulic conductivity rate of  $5.56 \times 10^{-6}$  cm/sec.<sup>37</sup> The same independent laboratory test of 3% bentonite-amended LTV coarse tailings—showing a hydraulic conductivity of  $1.8 \times 10^{-7}$  cm/sec<sup>38</sup>—also proves that the bentonite-amended *NorthMet* tailings on the beaches will achieve the modeled rate.<sup>39</sup> This is because the *NorthMet* tailings start with a *lower* permeability than the LTV coarse tailings that were tested with 3% bentonite.<sup>40</sup> So when the *NorthMet* flotation tailings on the beaches are mixed with the same 3% bentonite, they should have an even lower conductivity.<sup>41</sup>

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<sup>33</sup> Tr. Vol. 2 at 100:10–102:5 (Radue); Ex. 75 at 555–581 (Radue Rebuttal); Ex. 77 at 523–551 (Hull); Ex. 68; Ex. 70; *see also* Ex. 74 at 534–540 (Radue Direct); Ex. 75 at 81–92 (Radue Rebuttal).

<sup>34</sup> Tr. Vol. 4 at 57:23–59:3, 60:9–18, 61:11–62:8, 93:14–23 (Malusis); *see also* Tr. Vol. 2 at 98:5–12 (Radue); Ex. 75 at 451–471, 559–581 (Radue Rebuttal); Ex. 76 at 101–110, 433–454, 471–477, 480–488 (Hull Direct).

<sup>35</sup> Ex. 75 at 567–570; *see id.* at 559–581 (Radue Rebuttal).

<sup>36</sup> Ex. 74 at 290–330, 395–403, 588–590 (Radue Direct); Ex. 75 at 1229–1237.

<sup>37</sup> Tr. Vol. 1 at 46:2–6 (Radue); Ex. 75 at 217–225, 274–275.

<sup>38</sup> Tr. Vol. 1 at 62:20–63:6 (Radue); *see also id.* at 39:12–21; Tr. Vol. 2 at 110:11–111:19 (Radue); Ex. 74 at 331–336 (Radue Direct); Ex. 75 at 252–259, 291–294 (Radue Rebuttal); Ex. 16.

<sup>39</sup> Ex. 74 at 331–336 (Radue Direct); Ex. 75 at 257–259, 291–294 (Radue Rebuttal).

<sup>40</sup> Tr. Vol. 1 at 39:12–40:13, 64:7–17 (Radue).

<sup>41</sup> Tr. Vol. 1 at 39:12–40:13, 64:7–17 (Radue); Vol. 2 at 110:11–111:19 (Radue).

**3. If needed, bentonite can be applied to the pond bottom and will be effective to maintain a permanent pond.**

Should a bentonite amendment on the pond bottom be necessary—and if the pond holds water, it may not be<sup>42</sup>—there are several potential application methods and products that could be used.<sup>43</sup> PolyMet’s preferred method is broadcasting a bentonite product, such as PondSeal (an AquaBlok product), uniformly across the pond surface and letting it sink to the bottom.<sup>44</sup> PolyMet’s witness John Hull provided several examples of projects that have successfully used this method to apply bentonite-amended materials through a water column.<sup>45</sup> One such example, a project at Machado Lake in California, broadcast AquaBlok uniformly across a 45-acre lake.<sup>46</sup> That project is scalable to a larger water body like the NorthMet tailings basin pond.<sup>47</sup> Petitioners, having offered no contrary testimony, failed to carry their burden of persuasion on this point.

As for performance, a bentonite amendment on the pond bottom would achieve expectations by reducing percolation and maintaining a permanent pond.<sup>48</sup> Modeling showed that a percolation rate of 6.5 inches per year would maintain a

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<sup>42</sup> Tr. Vol. 1 at 67:12–25 (Radue); Ex. 74 at 378–390, 821–830 (Radue Direct); Ex. 76 at 117–124 (Hull Direct); Ex. 219 at 0115626, n.19.

<sup>43</sup> Ex. 74 at 451–482 (Radue Direct); Ex. 76 at 214–262 (Hull Direct); Exs. 18, 19, 43.

<sup>44</sup> See Tr. Vol. 3 at 9:3–10:20 (discussing Ex. 14 at 14.06 and Ex. 60) (Hull); Ex. 74 at 453–459 (Radue Direct); Ex. 43.

<sup>45</sup> Tr. Vol. 2 at 123:16–124:18 (Hull); Tr. Vol. 3 at 11:7–12:18; Ex. 76 at 264–312 (Hull Direct); Exs. 42, 60.

<sup>46</sup> Ex. 76 at 267–270 (Hull Direct); Exs. 42, 60.

<sup>47</sup> Tr. Vol. 2 at 133:5–23 (Hull); Tr. Vol. 3 at 9:3–11:6 (Hull); Ex. 60; Ex. 76 at 157–159 (Hull Direct); Ex. 42.

<sup>48</sup> Ex. 74 at 808–833 (Radue Direct); Ex. 75 at 197–206, 603–614 (Radue Rebuttal); Ex. 76 at 76–86, 113–117, 131–135 (Hull Direct); Ex. 77 at 277–285 (Hull Rebuttal); Ex. 22; Ex. 23; Ex. 43 (“AquaBlok can achieve low permeability [1 x 10<sup>-8</sup> cm/sec or lower]”).

permanent pond in the basin.<sup>49</sup> That rate can be achieved through various combinations of layer thickness and hydraulic conductivity.<sup>50</sup> AquaBlok, for instance, can achieve a hydraulic conductivity rate of  $1.0 \times 10^{-8}$  cm/sec.<sup>51</sup> Hence, one of Petitioners' own witnesses said in a 2012 email that AquaBlok could be the "perfect" material for the pond bottom.<sup>52</sup>

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Based on the evidence presented at the hearing, the ALJ correctly concluded that the bentonite amendment can be effectively applied to the dam sides, pond bottom, and beaches.<sup>53</sup>

**B. A pond-bottom bentonite amendment would be effective in maintaining a permanent pond that covers the tailings.**

The ALJ next recommended finding that, if needed, the bentonite amendment on the pond bottom would be effective in maintaining a permanent pond that acts as a water cover over the stored tailings.<sup>54</sup> The ALJ based that recommendation on PolyMet's credible evidence that AquaBlok or approved equivalents have a proven track record with subaqueous applications and have successfully reduced

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<sup>49</sup> Tr. Vol. 1 at 46:11-12, 166:16-18, 171:18-25 (Radue); Tr. Vol. 2 at 45:4-9, 60:3-7 (Radue); Ex. 75 at 938-941, 1229-1231 (Radue Rebuttal).

<sup>50</sup> Tr. Vol. 1 at 163:2-9 (Radue); Tr. Vol. 2 at 51:3-19, 53:18-54:3, 60:3-7 (Radue); Tr. Vol. 3 at 9:16-22 (Hull).

<sup>51</sup> Ex. 43 ("AquaBlok can achieve low permeability [ $1 \times 10^{-8}$  cm/sec or lower]"); *see also* Tr. Vol. 2 at 54:4-15 (Radue); Ex. 75 at 610-614 (Radue Rebuttal).

<sup>52</sup> Tr. Vol. 5 at 87:3-9 (Benson); Ex. 66 at 66.15.

<sup>53</sup> OAH Record at 15-19, 32, ALJ report at 9-13, 26.

<sup>54</sup> OAH Record at 9, 32-33, ALJ report at 3, 26-27.

water leakage through pond bottoms.<sup>55</sup> Because the ALJ's findings of fact on this point were based on substantial evidence, they should be affirmed.<sup>56</sup>

The specific evidence that PolyMet gave on this issue included testimony from two experts, Tom Radue and John Hull.<sup>57</sup> Those experts explained that AquaBlok or an approved equivalent can be spread on the water's surface and will sink to the pond bottom. John Hull, who holds multiple relevant patents, explained in detail how these technologies work to stop pond leaks.<sup>58</sup> AquaBlok in particular can achieve permeability of  $1 \times 10^{-8}$  cm/sec or less, forming a barrier of low hydraulic conductivity on the pond bottom to ensure that the pond holds water.<sup>59</sup>

In sum, the hearing evidence showed that applying the bentonite amendment to the pond bottom would maintain a permanent pond.<sup>60</sup>

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<sup>55</sup> OAH Record at 21, ¶ 73, ALJ report at 15, ¶ 73.

<sup>56</sup> OAH Record at 21, 32–33, ALJ report at 15, 26–27.

<sup>57</sup> See Tr. Vol. 2 at 123:16–124:18, 126:11–127:22 (Hull); Tr. Vol. 3 at 9:3–10:20 (discussing Ex. 14 at 14.06 and Ex. 60) (Hull); Ex. 74 at 808–820, 830–833, 916–926 (Radue Direct); Ex. 76 at 264–312, 361–394 (Hull Direct); Exs. 42, 60.

<sup>58</sup> Tr. Vol. 3 at 9:3–10:20 (Hull); Ex. 76 at 76–86, 131–135, 224–245, 264–312 (Hull Direct).

<sup>59</sup> Ex. 43 (“AquaBlok can achieve low permeability [ $1 \times 10^{-8}$  cm/sec or lower]”); see also Tr. Vol. 2 at 54:4–15 (Radue); Ex. 75 at 610–614 (Radue Rebuttal).

<sup>60</sup> OAH Record at 21, 32, ALJ report at 15, 26; Ex. 74 at 808–820, 830–833, 916–926 (Radue Direct); Ex. 76 at 264–312, 361–394 (Hull Direct); Ex. 77 at 209–216 (Hull Rebuttal); Exs. 42, 60; see also Tr. Vol. 2 at 123:16–124:18, 126:11–127:22 (Hull); Tr. Vol. 3 at 9:3–10:20 (discussing Ex. 14 at 14.06 and Ex. 60) (Hull); Ex. 74 at 929–943, 1003–1007 (Radue Direct); Ex. 77 at 644–659 (Hull Rebuttal); Ex. 78 at 75–96, 108–118, 380–398, 423–432 (Diedrich Direct); Ex. 79 at 178–241 (Diedrich Rebuttal).

**C. Cation exchange would not consequentially reduce the effectiveness of the bentonite amendment.**

The DNR's hearing order also identified cation exchange as a factual dispute. Cation exchange is a transfer of positively charged ions from water to bentonite that can make bentonite more permeable. For example, when sodium ions at the bentonite surface are replaced by calcium or magnesium ions, the bentonite may become more permeable and thus less effective. But, based on the hearing evidence, the ALJ recommended finding that cation exchange would *not* consequentially reduce the effectiveness of the bentonite.<sup>61</sup> That recommendation relied on credible evidence that any cation exchange from either the water in the pond or precipitation would not threaten the bentonite amendment's effectiveness.<sup>62</sup>

First, for the pond water, PolyMet's expert Tamara Diedrich explained that PolyMet had done extensive work, including 17 years of geochemical characterization, to understand what constituents would be released from NorthMet tailings over the long term.<sup>63</sup> That geochemical characterization, along with water modeling, showed that the relevant cation concentrations will be moderate during operations and low after closure.<sup>64</sup>

Second, Diedrich considered cations in water from precipitation that could percolate through the 30 inches of LTV tailings on the basin sides. As a proxy, Diedrich looked groundwater that had percolated through hundreds of feet of LTV

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<sup>61</sup> OAH Record at 9, 32–33, ALJ report at 3, 26–27.

<sup>62</sup> OAH Record at 22–24, 32–33, ALJ report at 16–18, 26–27.

<sup>63</sup> Tr. Vol. 3 at 35:13–38:5, 41:19–42:19, 51:23–53:9 (Diedrich); Ex. 78 at 152–215 (Diedrich Direct); Exs. 39, 47–49.

<sup>64</sup> Ex. 78 at 152–159 (Diedrich Direct); Ex. 79 at 4–11, 332–335 (Diedrich Rebuttal); Exs. 49, 50.

tailings to reach a well at the base of the existing basin.<sup>65</sup> That well water significantly overestimates the cation concentrations in water percolating through just 30 inches of LTV tailings on the basin sides.<sup>66</sup> Still, Diedrich explained, the well water showed low cation concentrations.<sup>67</sup>

Diedrich concluded that, because the cations in water that would contact the bentonite amendment would be relatively dilute, the bentonite should keep its low hydraulic conductivity.<sup>68</sup> That conclusion held, according to Diedrich, even when cation concentrations were at their maximum predicted strength.<sup>69</sup> To reach her conclusion, Diedrich relied in part on studies—including a study co-authored by Petitioners' witness Benson—confirming that water with dilute cation concentrations allows bentonite to maintain low hydraulic conductivity.<sup>70</sup>

In short, the concentration of cations in the water at the basin will not be high enough to cause the kind of cation exchange that would reduce bentonite's effectiveness.<sup>71</sup> The ALJ's findings relied on this substantial evidence showing that cation

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<sup>65</sup> Tr. Vol. 3 at 69:12–71:1, 109:7–22 (Diedrich); Ex. 79 at 241–252 (Diedrich Rebuttal).

<sup>66</sup> Tr. Vol. 3 at 70:9–16, 109:7–15 (Diedrich); Ex. 79 at 241–252 (Diedrich Rebuttal). Cation concentrations in water relevant to the beaches also are expected to be low. Ex. 79 at 253–263 (Diedrich Rebuttal).

<sup>67</sup> Tr. Vol. 3 at 109:7–22 (Diedrich); Ex. 79 at 239–255 (Diedrich Rebuttal).

<sup>68</sup> Tr. Vol. 3 at 32:10–33:3, 35:5–19, 41:19–43:1, 44:21–45:4, 45:13–17, 106:8–108:17 (discussing Ex. 200.17 at 0737124 (Fig. 10)), 110:8–17 (Diedrich); Ex. 78 at 81–96, 114–118, 253–264, 384–387, 393–397, 423–432 (Diedrich Direct); Ex. 79 at 180–197, 207–209, 219–227 (Diedrich Rebuttal); Exs. 50–53.

<sup>69</sup> Tr. Vol. 3 at 32:10–33:3, 35:5–19, 41:19–43:1, 44:21–45:4, 45:13–17, 110:12–17 (Diedrich); Ex. 78 at 380–90, 393–397, 423–432 (Diedrich Direct).

<sup>70</sup> Tr. Vol. 3 at 106:5–108:17 (Diedrich); Ex. 78 at 380–387; Ex. 59; Ex. 200.17 at 0737124 (Fig. 10).

<sup>71</sup> Tr. Vol. 3 at 32:10–33:3, 35:5–19, 41:19–43:1, 44:21–45:4, 45:13–17, 68:22–25, 110:12–17 (Diedrich); Ex. 74 at 929–943, 1004–1007 (Radue Direct); Ex. 78 at 75–96, 108–



exchange would not consequentially impact the effectiveness of the bentonite amendment.<sup>72</sup>

**D. The bentonite amendment would reduce infiltration of oxygen and water into the stored tailings over time.**

The ALJ next recommended finding that bentonite amendment would be effective in reducing infiltration of oxygen and water into the stored tailings over time.<sup>73</sup> That recommendation, too, was based on credible evidence that PolyMet will ensure the long-term effectiveness of the bentonite amendment.<sup>74</sup> For example, the NorthMet Project will have monitoring and reporting systems in place to confirm the bentonite’s effectiveness, as well as the means to improve system performance, if necessary.<sup>75</sup> Those systems include a Plan-Do-Check-Act cycle to monitor system performance and make any needed improvements.<sup>76</sup> “Long-term monitoring and evaluation during operations and closure” are also “included in the permit

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118, 297–303, 331–335, 380–398, 423–432 (Diedrich Direct); Ex. 79 at 178–227 (Diedrich Rebuttal).

<sup>72</sup> OAH Record at 23, 32, ALJ report at 17, 26; Tr. Vol. 2 at 141:18–142:3 (Hull); Tr. Vol. 3 at 32:10–33:3, 34:15–35:19, 42:20–43:1, 44:21–45:4, 45:13–17, 110:8–16 (Diedrich); Ex. 74 at 929–943, 1003–1007 (Radue Direct); Ex. 77 at 209–216 (Hull Rebuttal); Ex. 78 at 75–96, 108–118, 297–303, 331–335, 380–398, 423–432 (Diedrich Direct); Ex. 79 at 178–241 (Diedrich Rebuttal); *see also* Ex. 77 at 644–659 (Hull Rebuttal).

<sup>73</sup> OAH Record at 9, 32–33, ALJ report at 3, 26–27.

<sup>74</sup> OAH Record at 24–27, 32–33, ALJ report at 18–21, 26–27.

<sup>75</sup> Tr. Vol. 1 at 78:10–24 (Radue); Tr. Vol. 3 at 21:1–18 (Hull); Ex. 74 at 799–806, 1011–1070, 1083–1096, 1125–1134 (Radue Direct); Ex. 75 at 299–310 (Radue Rebuttal); Exs. 31 and 220 at *e.g.*, 0115739–40 (Conditions 16, 16a–16e), 0115743 (Condition 33), and 0115751 (Condition 80).

<sup>76</sup> Tr. Vol. 1 at 78:10–18 (Radue); Ex. 74 at 597–613, 1011–1040, 1147–1150 (Radue Direct); Ex. 75 at 299–310, 687–697 (Radue Rebuttal); Ex. 20; *see also* Ex. 293 at 0715216–19 (Monitoring Plan for Field Tests).

conditions to ensure the system is performing as required.”<sup>77</sup> And separate environmental permits require ongoing water quality sampling and analysis, which will also help assess the bentonite amendment’s effectiveness.<sup>78</sup> Together, this hearing evidence showed that the bentonite amendment would be effective over the long term and would not degrade even if hydraulic conductivity increases above the modeled values.<sup>79</sup> Instead, the bentonite amendment will achieve modeled values for hydraulic conductivity and percolation over time.<sup>80</sup>

Petitioners’ witnesses had several theories about why the bentonite amendment would not stay effective over time, but none were credible, much less sufficient to carry Petitioners’ burden.

**I. Burrowing animals will not negatively impact the bentonite amendment.**

One of Petitioners’ ideas was that animals burrowing through the bentonite would reduce its effectiveness. But PolyMet’s witnesses explained that any such

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<sup>77</sup> Ex. 74 at 1068–1070 (Radue Direct); *see also* Exs. 31 and 220 at *e.g.* 0115739 (Conditions 16a–16e), 0115743 (Condition 33) and 0115751 (Condition 80), and Ex. 293 at 0715216–19 (Monitoring Plan for Field Tests).

<sup>78</sup> Ex. 74 at 1125–1130 (Radue Direct); Ex. 220 at 0115751 (Condition 80).

<sup>79</sup> OAH Record at 32, ALJ report at 26; Tr. Vol. 2 at 140:17–141:22 (Hull); Tr. Vol. 3 at 24:18–26:5 (Diedrich) Ex. 74 at 1160–1172 (Radue Direct); Ex. 77 at 386–415, 502–514, 681–705, 757–771 (Hull Rebuttal); Ex. 60; *see also* Ex. 75 at 982–985, 1157–1163, 1274–1276 (Radue Rebuttal).

<sup>80</sup> OAH Record at 32–33, ALJ report at 26–27; Tr. Vol. 1 at 62:20–63:6 (Radue); *see also id.* at 39:12–40:13; Tr. Vol. 2 at 110:11–111:19 (Radue); Ex. 74 at 327–336, 392–405, 588–592 (Radue Direct); Ex. 75 at 196–206, 291–296, 441–444, 448–450, 603–614, 1229–1238 (Radue Rebuttal); Ex. 76 at 131–135 (Hull Direct); Ex. 16; *see also* Ex. 74 at 929–943 (Radue Direct); Ex. 77 at 433–447 (Hull Rebuttal).

burrowing would cause no harm.<sup>81</sup> Even Petitioners' witness Malusis conceded that "animal burrowing is not a major concern for [him] on this project."<sup>82</sup> Petitioners thus failed to prove that burrowing animals will be a problem.<sup>83</sup>

## **2. The freeze-thaw cycle will not negatively impact the bentonite amendment.**

The freeze-thaw cycle also will not reduce bentonite's long-term effectiveness. Rather, the evidence showed that freeze-thaw cycles should result in either no change or a small *improvement* in hydraulic conductivity.<sup>84</sup> This means that the freeze-thaw cycle is not a problem,<sup>85</sup> as Petitioners' witness Benson confirmed in a memo that he wrote when he worked on the NorthMet Project.<sup>86</sup>

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<sup>81</sup> Ex. 74 at 1142–1147, 1258–1267 (Radue Direct); Ex. 75 at 1436–1439 (Radue Rebuttal). Radue testified regarding "the relative lack of animal burrows at the existing facility[,] with those that do exist often located near the base of the existing dam, many tens of feet below the future elevation of the bentonite amended cover layer." *Id.*

<sup>82</sup> Tr. Vol. 4 at 70:11–12 (Malusis). Indeed, it was refreshing to see Malusis "be quite honest" about animal burrowing. *Id.*

<sup>83</sup> Tr. Vol. 4 at 69:11–70:21 (Malusis); Tr. Vol. 5 at 37:17–20 (Benson). Of the seven expert filings submitted by Petitioners, only Kuipers' rebuttal testimony contains more than a brief mention of animal burrowing. *See* Ex. 203 (Kuipers Rebuttal). At least one of Petitioners' experts omits any discussion of either "animal" or "burrow" altogether. *See* Exs. 204, 205 (Thyne Direct and Rebuttal).

<sup>84</sup> Ex. 74 at 1142–1147, 1199–1215 (Radue Direct); Ex. 75 at 1504–1509 (Radue Rebuttal); Ex. 35.02; Ex. 61 at 61.13 ("A small decrease in hydraulic conductivity may be realized due to thaw consolidation."); Ex. 61.18 ("the hydraulic conductivity of the bentonite-amended materials at the FTB will not increase in response to freeze-thaw cycling regardless of the bentonite content that is employed. A small decrease in hydraulic conductivity may be realized due to thaw consolidation.").

<sup>85</sup> Ex. 74 at 1142–1215 (Radue Direct) and Ex. 35.02; Ex. 77 at 394–397 (Hull Rebuttal); *see also* Ex. 43.

<sup>86</sup> Tr. Vol. 3 at 120:2–15, 121:17–122:3 (Donohue); Ex. 80 at 28–32, 43–60 (Donohue Rebuttal); Ex. 61 at 61.12–21.

**3. Neither root penetration nor wet-dry cycling will negatively impact the bentonite amendment.**

Root penetration will not hurt bentonite's effectiveness either. The proposed bentonite-amended zones on the basin sides and beaches will be covered with 30 inches of tailings and vegetated with plants whose roots will not extend below that 30-inch cover.<sup>87</sup> PolyMet confirmed the feasibility of this plan by digging five test holes in the existing LTV basin, which has been vegetated for over 50 years.<sup>88</sup> None of those holes had roots below 26 inches; most did not extend below 18 inches.<sup>89</sup> Because Petitioners' witnesses offered no site-specific evidence to the contrary, they failed to carry their burden.<sup>90</sup>

The evidence that roots will not extend below the 30-inch tailings cover is even more significant because it negates one of Petitioners' main arguments against bentonite: wet-dry cycling. According to Petitioners, wet-dry cycling happens when bentonite dries out during droughts, increasing its permeability even when the drought ends. Petitioners' witness Benson testified that roots moving downward to water is "what causes the wet-dry cycling,"<sup>91</sup> and that 30 inches of tailings is not enough to prevent such root penetration.<sup>92</sup> But a half-century of vegetation growth in the existing basin shows that roots will not penetrate far enough to cause wet-dry

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<sup>87</sup> Tr. Vol. 2 at 88:4-8 (Radue); Ex. 74 at 1252-1257, 1281-1285 (Radue Direct); Ex. 75 at 1054-1069 (Radue Rebuttal); Ex. 79 at 284-286 (Diedrich Rebuttal); Ex. 14.04-14.05; Ex. 30; *see also* Ex. 77 at 467-490 (Hull Rebuttal); Ex. 37.

<sup>88</sup> Ex. 74 at 1244-1257 (Radue Direct); Ex. 75 at 1054-1069 (Radue Rebuttal); Ex. 30.

<sup>89</sup> Ex. 75 at 1054-1069 (Radue Rebuttal); Exs. 30, 37.

<sup>90</sup> Tr. Vol. 4 at 71:1-16 (Malusis); Tr. Vol. 5 at 37:3-16 (Benson); Ex. 74 at 1144-1147, 1252-1257 (Radue Direct); Ex. 75 at 1060-1069 (Radue Rebuttal); *see also* Tr. Vol. 3 at 123:3-11 (Donohue); Ex. 77 at 500-514 (Hull Rebuttal); *see e.g.*, Ex. 206 at 25-26, 30:19-31:6, 34:13-15 (Benson Direct).

<sup>91</sup> Tr. Vol. 5 at 119:23-120:3 (Benson).

<sup>92</sup> Ex. 206 at 26:16-27:11 (Benson Direct).

cycling.<sup>93</sup> This real-world evidence disproves wet-dry cycling theory. Benson’s backup claim—that wet-dry cycling will result from an excess of “potential evapotranspiration”—fails in the face of basic meteorologic data showing that precipitation in northern Minnesota exceeds evapotranspiration.<sup>94</sup>

PolyMet’s witness Radue explained how covering the bentonite amendment on the beaches and the sides with 30 inches of material will keep the bentonite saturated, thus avoiding wet-dry cycling.<sup>95</sup> PolyMet also plans to use a low percentage of bentonite in the amendment to “help maintain the structure of the bentonite-amended tailings, to limit the potential effects of excessive drying, wet-dry cycling, and differential settlement—typically cracking.”<sup>96</sup> Beyond that, “the Basin sides and beaches will always remain available for inspection and accessible” to resolve potential issues.<sup>97</sup> For all these reasons, the ALJ was right to conclude that neither root penetration nor wet-dry cycling will affect the bentonite amendment.

#### **4. Lateral underdrains will not negatively impact the bentonite amendment.**

Petitioners next suggest, through their witness Thyne, that lateral underdrains in the basin will provide a path around the bentonite amendment. But Thyne’s testimony about lateral underdrains was not credible.<sup>98</sup> Thyne did not

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<sup>93</sup> Ex. 74 at 1252–1254, 1281–1285 (Radue Direct); Ex. 75 at 1054–1069, 1491–1509 (Radue Rebuttal); Ex. 30; Ex. 14 at 14.04–05; *see also* Ex. 79 at 283–290.

<sup>94</sup> Ex. 75 at 1019–1051 (Radue Rebuttal); Ex. 72.

<sup>95</sup> Tr. Vol. 2 at 39:15–25, 88:9–18 (Radue); Ex. 74 at 1252–1257, 1281–1285 (Radue Direct); Ex. 75 at 1052–1069 (Radue Rebuttal); *see also* Tr. Vol. 1 at 71:21–23 (Radue), Ex. 74 at 1275–1299 (Radue Direct); Ex. 75 at 1083–1103, 1491–1509 (Radue Rebuttal); Ex. 79 at 283–290 (Diedrich Rebuttal); Ex. 30.

<sup>96</sup> Ex. 74 at 1277–1294 (Radue Direct).

<sup>97</sup> Ex. 74 at 1296–1299 (Radue Direct).

<sup>98</sup> *See* Tr. Vol. 4 at 203:17–208:5 (Thyne).

create the NorthMet Project engineering drawings on which he relied. He is not even an engineer.<sup>99</sup> He merely made erroneous assumptions about the engineering drawings,<sup>100</sup> and he did not accurately describe how underdrains work.<sup>101</sup> Contrary to Thyne's claims, the exposed ends of the underdrain and the foundation layer will be covered by bentonite amended tailings and thus will not provide an entry point for air or water.<sup>102</sup> Radue explained at the hearing how the underdrains actually work and why they will not allow oxygen or water to access the tailings.<sup>103</sup>

**5. Benson's testimony about the bentonite amendment was not credible.**

Finally, on top of all the other reasons the ALJ's findings on these points were supported by substantial evidence, Benson's testimony about the bentonite amendment was not credible. While Benson appeared at the hearing as a witness for Petitioners, he previously worked as a consultant on the NorthMet Project. During his time as a NorthMet Project consultant, Benson attended team meetings in which he could have identified issues or gaps that needed to be addressed, but he did not.<sup>104</sup> Nor did Benson ever document any concerns about the bentonite amendment.<sup>105</sup> What is more, Benson sent Radue a table identifying six sites where soil-bentonite

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<sup>99</sup> Tr. Vol. 4 at 196:14–20, 237:18–22 (Thyne).

<sup>100</sup> Tr. Vol. 4 at 227:10–228:14 (Thyne).

<sup>101</sup> Ex. 75 at 1619–1644 (Radue Rebuttal).

<sup>102</sup> Ex. 75 at 1621–1623 (Radue Rebuttal).

<sup>103</sup> Ex. 75 at 1619–1644 (Radue Rebuttal).

<sup>104</sup> Tr. Vol. 3 at 118:25–119:10, 126:4–21 (discussing Ex. 61 at 61:12–21), 132:19–133:4, 134:8–20 (Donohue); Tr. Vol. 5 at 36:24–39:11 (Benson); Ex. 80 at 61–97, 104–111 (Donohue Rebuttal).

<sup>105</sup> Tr. Vol. 3 at 123:3–22, 127:4–7, 134:8–20 (Donohue); Tr. Vol. 5 at 36:24–39:11 (Benson); Ex. 80 at 43–109 (Donohue Rebuttal); Ex. 61.

materials were used to cover mine wastes,<sup>106</sup> and he told Radue that a tailings-bentonite mixture would take less bentonite to achieve the same low hydraulic conductivity as a sand-bentonite mixture.<sup>107</sup> And, as noted above, Benson described Aqua-Blok as “perfect material” for the NorthMet Project.<sup>108</sup> Indeed, during all the time Benson worked on the NorthMet Project, he never said that the bentonite amendment would degrade and become ineffective within several years, as he said at the hearing<sup>109</sup>—despite having already written the 2011 article on which he now relies.<sup>110</sup> In sum, given his prior work as a consultant on the project, Benson’s newly found criticisms of the bentonite amendment lacked credibility.

## II. The DNR should reject the ALJ’s legal conclusions about the Rule.

Despite correctly finding that bentonite would work as planned, the ALJ recommended denying PolyMet’s permit to mine on legal grounds. Under section 14.62, DNR can reject or modify the ALJ’s recommendations, including his conclusions of law. Minn. Stat. § 14.62, subd. 1. Indeed, the Commissioner’s Designee owes no deference to the ALJ’s legal conclusions. *In re Excess Surplus Status of Blue Cross & Blue Shield of Minn.*, 624 N.W.2d 264, 278 (Minn. 2001). Because those legal conclusions are inconsistent with the Rule, they should be rejected.

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<sup>106</sup> Tr. Vol. 5 at 41:3–42:6 (Benson); Ex. 75 at 343–347, 791–794 (Radue Rebuttal); Ex. 66 at 66.12, 14.

<sup>107</sup> Tr. Vol. 1 at 58:24–59:5 (Radue); Tr. Vol. 5 at 77:1–14 (Benson); Ex. 75 at 240–244 (Radue Rebuttal); Ex. 67.

<sup>108</sup> Ex. 75 at 605–606, 877–878, 891–895 (Radue Rebuttal); Ex. 66 at 66.15; *see also* Tr. Vol. 2 at 97:1–20 (Radue); Tr. Vol. 5 at 87:3–9 (Benson).

<sup>109</sup> Tr. Vol. 3 at 123:3–22, 127:4–7, 132:19–133:4, 134:8–20 (Donohue); Tr. Vol. 5 at 36:24–39:11 (Benson); Ex. 80 at 43–111 (Donohue Rebuttal) and Ex. 61; *see also* Ex. 75 at 240–249, 1327–1332 (Radue Rebuttal); Exs. 66–67.

<sup>110</sup> Ex. 206 at 12, 14, 25, 26, 28, 31, 36 and 39 (Benson Direct); Ex. 206.05.

**A. In making legal rulings, the ALJ went beyond his mandate.**

As a threshold point, the ALJ should not have even tried to interpret the non-ferrous mining rules. The Supreme Court ordered DNR to hold a contested case on the bentonite issue under Minnesota Statutes section 93.483, subdivision 3(a). *Permit to Mine*, 959 N.W.2d at 745–47, 753–54. Under that subdivision, one of the prerequisites for ordering a contested case is “a material issue of fact in dispute.” Minn. Stat. § 93.483, subd. 3(a)(1). Legal disputes are not mentioned, and the meaning of the Rule is a legal dispute, not a fact dispute. *See In re Max Schwartzman & Sons, Inc.*, 670 N.W.2d 746, 757 (Minn. Ct. App. 2003) (affirming denial of contested case on “legal issues”); *compare Costle v. Pac. Legal Found.*, 445 U.S. 198, 204 (1980) (“If a request for an adjudicatory hearing raises only legal issues, a hearing will not be granted.”). Beyond that, the Commissioner alone sets the scope of a contested case hearing, including by identifying “the issues to be resolved.” Minn. Stat. § 93.483, subd. 5. The issues identified by the Commissioner here were “five specific fact disputes.” Because the Commissioner never asked the ALJ to interpret the Rule, the ALJ’s interpretation should be discarded as outside the agency’s referral.

**B. The bentonite amendment is a practical and workable reclamation technique.**

**1. Whether bentonite is practical and workable does not depend on the Rule.**

The Supreme Court ordered a contested case hearing on the question of “whether the bentonite amendment . . . is a ‘practical and workable’ reclamation technique that will satisfy the DNR’s reactive waste rule.” *Permit to Mine*, 959 N.W.2d at 754. That question involves two separate legal requirements. *First*, Minnesota Statutes section 93.481—which governs mining permits—requires all



reclamation techniques to be “practical and workable under available technology.” Minn. Stat. § 93.481, subd. 2. *Second*, the nonferrous mining rules set special reclamation standards for reactive mine waste. Minn. R. 6132.2200, subp. 2.

The ALJ’s explanation of “practical and workable” mistakenly mixes these two legal requirements. Part of the ALJ’s decision relies on dictionary definitions to say that the “bentonite amendment is ‘practical and workable’ if it is likely to achieve what is intended in the real-world situation contemplated for the NorthMet Project’s tailings Basin.”<sup>111</sup> PolyMet would not quarrel with that definition, which properly uses the dictionary to find the words’ plain meaning.<sup>112</sup> *See Schneider v. Children’s Health Care*, 996 N.W.2d 197, 202–03 (Minn. 2023). Later, though, the ALJ adds a clause to the end of its dictionary-based definition: “while complying with Minnesota’s Reactive Mine Waste Rule.” PolyMet objects to that qualifier, which hitches the statute’s “practical and workable” requirement to the whole sweep of the Rule. Having made that mistake, the ALJ erred in concluding that “[t]he bentonite amendment is not a practical and workable reclamation technique.”<sup>113</sup>

The ALJ should have seen that the mining statute’s “practical and workable” requirement is one of three separate reclamation criteria in section 93.481, subdivision 2: (1) the reclamation must comply “with lawful requirements”; (2) the reclamation must be accomplished using “available technology”; and (3) the reclamation “technique” must be “practical and workable under available technology.” This list

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<sup>111</sup> OAH Record at 31, ALJ report at 25; *see id.* at 33, OAH Record at 39.

<sup>112</sup> The other parties also agree with this part of the definition. *See* OAH Record at 1608, Conservation Organizations’ Posthearing Brief at 6 (quoting DNR Posthearing Brief at 9).

<sup>113</sup> OAH Record at 33, ALJ report at 27.

of criteria shows why complying with the Rule is distinct from whether a reclamation technique is “practical and workable.” If a planned reclamation failed to comply with the Rule, it would violate subdivision 2’s first criterion—compliance “with lawful requirements.” By contrast, whether the reclamation technique is “practical and workable” falls under subdivision 2’s third criterion. So when the ALJ found that the bentonite amendment was not practical and workable because it did not comply with the Rule,<sup>114</sup> he improperly blended subdivision 2’s first and third criteria.

The ALJ was right to hold that a reclamation technique is practical and workable when it is “likely to do or achieve what is intended.”<sup>115</sup> And the ALJ’s factual findings affirm that the bentonite amendment is likely to achieve its reclamation goals.<sup>116</sup> The ALJ’s mistake was grafting compliance with the Rule onto the basic “practical and workable” requirement. Thus, the Commissioner’s Designee should reject the ALJ’s conclusion and instead find that the bentonite amendment is practical and workable.

**2. Finding a technique “practical and workable” does not require field trials or commercial use.**

Separate from the ALJ’s reading of the statute, Petitioners have argued for a different definition of “practical and workable.” They say that a reclamation technique is not practical and workable unless the specific use being proposed has been “validated” by “significant field-trial success or commercial use.”<sup>117</sup> Or, as they wrote

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<sup>114</sup> OAH Record at 31, 39, ALJ report at 25, 33.

<sup>115</sup> OAH Record at 39, ALJ report at 33 (quoting *Cambridge Dictionary*).

<sup>116</sup> OAH Record at 15–26, ALJ report at 9–20; *see supra*, section I.

<sup>117</sup> OAH Record at 6902–04, Conservation Organizations’ Prehearing Brief at 5–7; *see* OAH Record at 1608, Conservation Organizations’ Posthearing Brief at 6 (citing

in a post-hearing brief: “Practical and workable’ requires real-world, successful examples.”<sup>118</sup> The ALJ was right to dismiss this claim.

Field-trial validation and commercial use are specific kinds of evidence. Such evidence could help show that a technique is practical and workable, but it is not the only kind of evidence that could be used. Indeed, the statute empowers the Commissioner to “determine” whether a technique is “practical and workable under available technology.” Minn. Stat. § 93.481, subd. 2. It does not limit the kinds of evidence that the Commissioner can use in making that determination, much less require real-world examples.

Nor has the Supreme Court “indicated,” as Petitioners put it, that a “practical and workable” finding requires specific kinds of evidence.<sup>119</sup> To the contrary, the Court held that if the Commissioner’s “practical and workable” determination “is supported by substantial evidence, it must be affirmed.” *Permit to Mine*, 959 N.W.2d at 749 (citation omitted). The evidence here proves that the bentonite amendment “is likely to achieve what is intended in the real-world situation contemplated for the NorthMet Project’s tailings Basin.”<sup>120</sup> The Commissioner’s Designee should reject Petitioners’ contrary claims and affirm that the bentonite amendment is practical and workable.

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witness testimony to argue for “either substantially similar cover systems or robust long-term field-trial data”).

<sup>118</sup> OAH Record at 1607, Conservation Organizations’ Posthearing Brief at 5.

<sup>119</sup> OAH Record at 1607, Conservation Organizations’ Posthearing Brief at 5.

<sup>120</sup> OAH Record at 31, ALJ report at 25; *see supra*, section I.

### **C. The NorthMet Project complies with the Rule.**

The NorthMet Project also satisfies the requirements that govern nonferrous mining, including the Rule. Those rules recognize both the benefits and the risks of nonferrous mining. *See* Minn. R. 6132.0200 (emphasizing that the nonferrous rules are meant to protect the environment and encourage mining). And they recognize that every mine is different. That is why, as the ALJ explained, the nonferrous rules create “an outcome-based regulatory framework” rather than “specific performance standards.”<sup>121</sup> The rules aim to prevent environmental harm without pre-selecting individual reclamation techniques—“build[ing] in enough flexibility, while still providing basic direction on how reclamation can be achieved.”<sup>122</sup> Here, the ALJ’s decision not only fails to account for the nonferrous rules’ overall “flexibility,” it misses the Rule’s plain meaning.

#### **1. A mine satisfies the Rule if it meets either of two standards.**

Setting aside the ALJ’s lack of authority to interpret it, Minnesota Rule 6132.2200 governs reactive mine waste. Under subpart 2(B) of that rule, nonferrous mines must meet at least one of two standards for storing reactive mine waste. Specifically:

A reactive mine waste storage facility must be designed . . . to either:

- (1) modify the physical or chemical characteristics of the mine waste, or store it in an environment, such that the waste is no longer reactive; or

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<sup>121</sup> OAH Record at 36, ALJ report at 30 (citing *MCEA v. MNDR*, No. A18-1956, 2019 WL 3545839 (Minn. Ct. App. 2019)).

<sup>122</sup> OAH Record at 37, ALJ report at 31 (quoting Statement of Need and Reasonableness at 8).

(2) during construction to the extent practicable, and at closure, permanently prevent substantially all water from moving through or over the mine waste and provide for the collection and disposal of any remaining residual waters that drain from the mine waste in compliance with federal and state standards.

Minn. R. 6132.2200, subp. 2(B)(1) & (2). The ALJ's conclusion that the NorthMet Project could not meet either of these reactive mine waste storage standards misreads the rule.<sup>123</sup>

**3. The NorthMet Project stores tailings in an environment that protects natural resources.**

Subpart 2(B)(1) describes the first standard for storing reactive mine waste. Within that subpart, there are two distinct options. A storage facility meets subpart 2(B)(1) if it is designed to either “modify the physical or chemical characteristics of the mine waste . . . such that the waste is no longer reactive” or “store” the waste “in an environment” where it is “no longer reactive.” Minn. R. 6132.2200, subp. 2(B)(1). The NorthMet Project is designed to satisfy the second option: storing mine waste in an environment where it is no longer reactive.

**a. Under the rule, reactivity turns on the level of impact to natural resources.**

While the two options offered by subpart 2(B)(1) are different, both require that the mine waste be “no longer reactive.” Minn. R. 6132.2200, subp. 2(B)(1). To understand when mine waste is no longer reactive requires reviewing the nonferrous rules' definitions because “reactive mine waste” is a defined term. It means a mine waste that will “release substances that adversely impact natural resources.” Minn.

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<sup>123</sup> OAH Record at 31, 33, ALJ report at 25, 27.

R. 6132.0100, subp. 28. So a mine waste is “no longer reactive” when it will no longer “release substances that adversely impact natural resources.”

The nonferrous mining rules also define the term “adversely impact natural resources.” That term means “an unacceptable level of impact on the natural resources as determined by the commissioner based on an evaluation which considers the value of the resource and the degree of impact.” Minn. R. 6132.0100, subp. 3. Reading this definition together with the definition of “reactive mine waste” establishes that mine waste is “no longer reactive” under subpart 2(B)(1) when it will no longer “release substances” that have “an unacceptable level of impact on the natural resources” around the waste. Minn. R. 6132.0100, subps. 3, 28.

Applying these definitions shows that the question under subpart 2(B)(1) is not simply whether the mine waste is releasing potentially harmful substances. Rather, the question is whether those substances will actually have “an unacceptable level of impact” on natural resources. Minn. R. 6132.0100, subp. 3. If the mine waste storage facility *either* modifies the character of the waste in a way that prevents unacceptable impacts on natural resources *or* stores the waste in an environment that prevents unacceptable impacts on natural resources, subpart 2(B)(1) is met.

**b. The rule does not require tailings to be stored so that they stop releasing pollutants.**

The issue here is whether the NorthMet Project will store tailings in an environment that prevents them from having an unacceptable impact on natural resources—not whether the tailings themselves have been modified. But the petitioners ignore this distinction. They say that subpart 2(B)(1) requires waste to be stored

so that “it no longer releases the substances that made it reactive in the first place,”<sup>124</sup> and that the storage environment must “prevent reactions from occurring.”<sup>125</sup> The ALJ adopted this approach, reasoning that “a waste is no longer reactive if, as a result of its storage, it ceases to release the substances that made it reactive in the first place into natural resources.”<sup>126</sup>

The ALJ’s focus on releases and reactions would be appropriate for the first option in subpart 2(B)(1), which allows storage of waste that is physically or chemically “modif[ied]” so that it is no longer reactive. Minn. R. 6132.2200, subp. 2(B)(1). But this case is about the second option in subpart 2(B)(1), which says nothing about changes to the waste itself. Instead, subpart 2(B)(1)’s second option focuses on the “environment” in which the waste is stored.

If the ALJ and petitioners were right that subpart 2(B)(1)’s second option required the waste to “cease releasing” potentially harmful substances, then the second option would be no different from the first. Reading such redundancy into a rule is seldom appropriate. Indeed, the Minnesota Supreme Court has held that, “[w]hen possible, no word, phrase or sentence” of a rule “should be deemed superfluous, void, or insignificant.” *Troyer v. Vertlu Mgmt. Co.*, 806 N.W.2d 17, 24 (Minn. 2011) (internal quotation marks omitted). Yet that is just what the ALJ’s interpretation of subpart 2(B)(1) does. The only way to make tailings “cease” releasing substances is to “modify” their “physical or chemical characteristics,” as subpart 2(B)(1)’s first option allows. If subpart 2(B)(1)’s second option also required the tailings to

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<sup>124</sup> OAH Record at 1487, Fond du Lac Posthearing Brief at 3; *see id.* at 6 (OAH Record at 1490).

<sup>125</sup> OAH Record at 1614, Conservation Organizations Posthearing Brief at 12.

<sup>126</sup> OAH Record at 40, ALJ report at 34.

“cease” releasing substances, it would be superfluous. So the second option must mean something else.

**c. The NorthMet Project is designed to stop tailings from harming natural resources.**

Instead of “modify[ing]” the mine waste, subpart 2(B)(1)’s second option allows waste to be stored “in an environment” that stops reactivity. But neither the ALJ nor the petitioners tried to interpret the second option’s key phrase, “in an environment.” Such an interpretation must start with the term “environment.”

Since the rule does not define “environment,” the word’s “common and approved usage”—i.e., its dictionary definition—controls. Minn. Stat. § 645.08(1); *see Appeal of Krenik*, 903 N.W.2d 224, 229 (Minn. 2017). The dictionary’s common and approved usage of “environment” in this context is a “general set of conditions or circumstances.”<sup>127</sup> Thus, the “environment” in which mine waste is stored includes not only its immediate surroundings, but also the larger “conditions and circumstances” of its storage.

For the NorthMet Project, those larger conditions and circumstances of storage include the entire Tailings Storage Facility—which involves both seepage capture and wastewater treatment systems.<sup>128</sup> These systems, together with the bentonite amendment and other engineering controls, will store tailings in a way that stops them from having an “unacceptable level of impact” on natural resources. Minn. R. 6132.0100, subp. 3. As a result, the NorthMet Project’s tailings storage plan satisfies subpart 2(B)(1) of the Rule.

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<sup>127</sup> *Environment*, Am. Heritage Dictionary 597 (5th ed. 2018).

<sup>128</sup> Ex. 210 at 0065583; Ex. 219 at 0115580, ¶¶ 238, 240; *id.* at 0115656–57, ¶ 696; Ex. 212 at 0066800, 0066803–807.



Petitioners challenge this reading of subpart 2(B)(1) by asserting that the “environment” in which the tailings are stored is limited to the tailings basin and “does not extend to the seepage containment and treatment systems.”<sup>129</sup> But they offer no support for this assertion. Subpart 2(B)(1) uses a broad term—“environment”—to describe how reactive mine waste may be stored. Since “environment” includes a “general set of conditions and circumstances,”<sup>130</sup> it covers the seepage capture and water treatment systems that are part of PolyMet’s Tailings Management Plan.<sup>131</sup>

Petitioners also complain that the seepage capture and water treatment systems were excluded from the contested case hearing.<sup>132</sup> As they see it, considering those other systems would improperly “reopen” them to consideration without a full hearing.<sup>133</sup> Petitioners must admit, however, that “the Supreme Court did not order a contested case on those issues . . . .”<sup>134</sup> They cannot turn that loss into a win by forcing everyone else to ignore facts that the Court did not let them challenge in the contested case.<sup>135</sup> Instead, the Commissioner’s Designee must accept the permit’s conclusions about PolyMet’s seepage capture and water treatment systems as part

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<sup>129</sup> OAH Record at 1492, Fond du Lac Posthearing Brief at 8.

<sup>130</sup> *Environment*, Am. Heritage Dictionary 597 (5th ed. 2018).

<sup>131</sup> Ex. 210 at 0065583; Ex. 219 at 0115580, ¶¶ 238, 240; *id.* at 0115656–57, ¶ 696; Ex. 212 at 0066800, 0066803–807.

<sup>132</sup> OAH Record at 1495, Fond du Lac Posthearing Brief at 11.

<sup>133</sup> OAH Record at 1495, Fond du Lac Posthearing Brief at 11.

<sup>134</sup> OAH Record at 1496, Fond du Lac Posthearing Brief at 12.

<sup>135</sup> OAH Record at 1496, Fond du Lac Posthearing Brief at 12.

of the larger context. Thus, the NorthMet Project tailings will be stored in an environment where they are no longer reactive.<sup>136</sup>

**4. The NorthMet Project prevents substantially all water from moving through or over the tailings.**

Subpart 2(B)(2) of the Rule offers a second, separate standard under which a tailings storage facility can comply with the Rule. Under that subpart, a storage facility satisfies the rule if it is designed to “permanently prevent substantially all water from moving through or over the mine waste and provide for the collection and disposal of any remaining residual waters that drain from the waste in compliance with federal and state standards.” Minn. R. 6132.2200, subp. 2(B)(2). The NorthMet tailings storage plan satisfies this subpart, too.

**a. Water does not move through or over tailings simply by touching them.**

As with subpart 2(B)(1), understanding the scope of subpart 2(B)(2) starts with the rule’s text. Petitioners have argued that subpart 2(B)(2) barred water from “contacting” mine waste.<sup>137</sup> That reading ignored the text of subpart 2(B)(2), which uses the phrase “through or over,” not the word “contacting.” In fact, DNR struck

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<sup>136</sup> Petitioners argued in a supplemental contested case filing that the Minnesota Supreme Court’s decision on the Pollution Control Agency’s groundwater discharge rules meant that the tailings basin could not comply with environmental standards. The ALJ did not address that argument. And because the Supreme Court’s decision affected only an MPCA rule, not DNR’s rules, it should not affect the Commissioner Designee’s decision either. Only MPCA can judge compliance with its rules, and the Supreme Court made clear that a variance was possible. *Matter of Denial of Contested Case Hearing Requests*, 993 N.W.2d 627, 665–66 (Minn. 2023).

<sup>137</sup> OAH Record at 6905–06, 6910, Conservation Orgs. Prehearing Br. at 8, 9, 13.

the word “contacting” from the final rule language and replaced it with the phrase “through or over.” 17 Minn. Reg. 2208 (Mar. 15, 1993).

The change from “contacting” to “through or over” is significant. Water moving “through or over” waste is different from water “contacting” waste. The word “through” means “[i]n one side and out the opposite or another side of.”<sup>138</sup> “Over” similarly means “[t]o the other side of; across.”<sup>139</sup> So when the rule uses the phrase “through or over,” it focuses on stopping water from moving “out” of or “across”—i.e., *escaping*—the mine waste. It does not prohibit water from contacting the waste.

The ALJ never explains how he interpreted the phrase “through or over” in subpart 2(B)(2). But he does talk in terms of how much “water seepage” will occur at the tailings basin.<sup>140</sup> Since seepage refers to the water that is escaping the tailings basin, the ALJ seems to be applying the right definition of “through or over.”

Petitioners, by contrast, talk in terms of how much water “will infiltrate into tailings.”<sup>141</sup> Their problem is that water does not violate subpart 2(B)(2) just by entering the tailings because that water has not passed “through or over” the tailings. And the question for purposes of subpart 2(B)(2) is whether the facility stops “substantially all” water from escaping—not just entering—the stored tailings.

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<sup>138</sup> *Through*, Am. Heritage Dictionary 1814 (5<sup>th</sup> ed. 2018).

<sup>139</sup> *Over*, Am. Heritage Dictionary 1254 (5<sup>th</sup> ed. 2018).

<sup>140</sup> OAH Record at 42, ALJ report at 36.

<sup>141</sup> OAH Record at 1501, Fond du Lac Posthearing Brief at 17; *see id.* at 21, 22 (OAH Record at 1505–06).

**b. “Substantially all” water means a proportion of the total water, not an absolute amount.**

Even though the ALJ used the right definition of “through or over,” he erred in deciding that the NorthMet Project does not comply with subpart 2(B)(2). This error seems to stem from confusion between the word “substantial” and the phrase the rule actually uses, “substantially all.” Substantial just means “[c]onsiderable in importance, value, degree, amount, or extent.”<sup>142</sup> So when the ALJ described “an enormous amount of impaired water” escaping from the tailings basin, he was talking about a substantial amount of water.<sup>143</sup> The same is true of the ALJ’s claim that “the real issue” is “the total amount of water that will go over or through the mine waste”<sup>144</sup> and of Petitioners’ arguments, which also focus on total volumes.<sup>145</sup>

The problem with the ALJ’s reasoning is that a substantial amount of water is not the same as “substantially all” water, especially in the context of the Rule’s limit on water moving “through or over” mine waste. By using the phrase “through or over,” the rule focuses on water escaping the mine waste storage facility. It does not prohibit water from contacting the mine waste. Since the rule lets water contact the mine waste, the mine waste storage facility must also be allowed to store water. The same conclusion flows from the rule’s reference to collecting water that may “drain from” the facility. Minn. R. 6132.2200, subp. 2(B)(2). Water drains from a place where it is stored—in the rule, that means the mine waste storage facility.

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<sup>142</sup> *Substantial*, Am. Heritage Dictionary 1738 (5<sup>th</sup> ed. 2018).

<sup>143</sup> OAH Record at 43, ALJ report at 37.

<sup>144</sup> OAH Record at 43, ALJ report at 37.

<sup>145</sup> OAH Record at 1501–02, Fond du Lac Posthearing Brief at 17–18.

Realizing that subpart 2(B)(2) allows water to be stored in the tailings facility makes sense of the requirement to “prevent substantially all water from moving through or over the mine waste.” Under subpart 2(B)(2), a facility must stop “substantially all water” *stored with the waste* from escaping. Minn. R. 6132.2200, subp. 2(B)(2). Any water that does escape must be collected and treated. *Id.*

**c. PolyMet will prevent substantially all water from escaping the tailings, capturing and treating any that does.**

The NorthMet Project’s tailings storage facility prevents “substantially all” of the water stored with the mine waste from escaping. The ALJ’s findings bear this out. As the ALJ explained, the tailings basin stores 32.1 billion gallons of water.<sup>146</sup> Of that volume, just 298 million gallons seep out in any one year.<sup>147</sup> That means that “99.56% of the water will stay in the Basin”—only 0.44%<sup>148</sup> will escape.<sup>149</sup>

By any reckoning, 99.56% is “substantially all” of the water in the tailings basin. Letting forty-four hundredths of a percent escape is like taking a half-ounce

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<sup>146</sup> OAH Record at 42, ALJ report at 36.

<sup>147</sup> OAH Record at 42, ALJ report at 36.

<sup>148</sup> The ALJ report contains a typographical error in this number; the correct percentage is 0.44%, not 0.044%.

<sup>149</sup> OAH Record at 42, ALJ report at 36. By design, about 160 million gallons of water per year (304 gallons per minute) will seep out of the pond at closure. *See* Tr. Vol. 2 at 113:21–114:19 (Radue); Ex. 75 at 938–945 (Radue Rebuttal); Ex. 81; Ex. 216 at 0741193. Yet approximately 2,170 million gallons will be stored in the pond, 32,180 million gallons will be stored in the basin below the pond, and 2,030 million gallons will be stored in the beaches and dams. *See* Tr. Vol. 2 at 116:12–117:5 (Radue); Ex. 81; *see also* Ex. 216 at 0741771, 0741806–07; Ex. 217 at 0034453. In sum, not even counting the water stored in the existing LTV cells 2W or 1E/2E, the basin will store 36,380 million gallons of water. *See* Tr. Vol. 2 at 116:12–117:5 (Radue); Ex. 81; *see also* Ex. 216 at 0741771, 0741788, 0741802, 0741804, 0741806–07; Ex. 217 at 0034452–53. This means that about 99.56% of the water will stay (*i.e.*, be stored) in the basin while just 0.44% of the water will seep out of the pond.

eyedropper out of a gallon jug—the amount that stays in the jug is substantially all the water. The same is true with the tailings basin. Millions of gallons may leave, but billions remain. Thus, the storage facility prevents “substantially all” water from “moving through or over the mine waste.” Minn. R. 6132.2200, subp. 2(B)(2).

The ALJ used different analogies, calculating that water escaping the tailings basin would fill 451 Olympic swimming pools or 27,091 tanker trucks.<sup>150</sup> But those analogies are inapt because they speak only to the volume of water leaving the basin, without comparing it to the amount still in the basin. By the ALJ’s logic, a small tailings basin that let half its water escape might satisfy the Rule, while a large facility that retained virtually all its water, as the NorthMet basin does, would not. Neither this logic nor the ALJ’s analogies fit with the Rule’s key phrase—“substantially all”—which creates a test that is proportional, not absolute. And none of the ALJ’s analogies even acknowledge much less account for collection and treatment, as is expressly provided for in the Rule.

The NorthMet Project mine waste storage facility is also designed to collect and dispose of any water that drains from the waste. The ALJ does not discuss this point, but the permitting record shows how that collection and disposal will work. In short, the project will use an underground wall to stop seepage from moving beyond its boundaries.<sup>151</sup> That seepage will then be collected and pumped back to a wastewater treatment plant where it will be treated “in compliance with federal and

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<sup>150</sup> OAH Record at 43, ALJ report at 37.

<sup>151</sup> Ex. 210 at 0065583; Ex. 219 at 0115580, ¶¶ 238, 240; *id.* at 0115656–57, ¶ 696; Ex. 212 at 0066800, 0066803–807.

state standards.”<sup>152</sup> Minn. R. 6132.2200, subp. 2(B)(2). In this way, the project will satisfy subpart 2(B)(2) of the Rule.

**III. The Commissioner’s Designee should reject or modify some of the ALJ’s revised permit to mine conditions.**

Because the ALJ must be “subordinate to [the] agency,” Minnesota Statutes section 14.62 gives the Commissioner’s Designee authority to reject or modify the ALJ’s findings and recommendations. *City of Moorhead v. Minn. Pub. Utils. Comm’n*, 343 N.W.2d 843, 847 (Minn. 1984); see Minn. Stat. § 14.62, subd. 1. If those findings and recommendations are not supported by substantial evidence, the agency may reject or modify them—it owes “no particular deference to the ALJ’s report.” *In re Grand Rapids Pub. Utils. Comm’n*, 731 N.W.2d 866, 871 (Minn. Ct. App. 2007). Courts defer to the agency decisionmaker, not the ALJ. *Id.*; see *In re Excess Surplus*, 624 N.W.2d at 278. Here, the ALJ recommended adding several new special conditions if the permit is reinstated. Some of those conditions are either unclear or not supported by substantial evidence.

**A. The Commissioner’s Designee should modify the proposed requirement for large-scale field testing.**

The ALJ recommended special conditions that require lab, bench, and field scale testing of the bentonite amendments proposed for the dam sides, beaches, and pond bottom. Recognizing that NorthMet tailings will not be available until after mining starts, those conditions include field-scale testing of “surrogate tailings or otherwise” for the beaches and pond bottom. The new conditions also suggest that “LTV tailings modified to be representative of expected NorthMet tailings particle

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<sup>152</sup> See Ex. 210 at 0065562.

size distribution” could be such a “surrogate.” This may make sense for lab and bench testing, but substantial evidence from the hearing shows that large-scale field testing for beaches and pond bottom requires NorthMet tailings.

The evidence starts with PolyMet’s experts, who were clear that field testing would require hundreds of tons of tailings.<sup>153</sup> That is far more than PolyMet now has.<sup>154</sup> Indeed, PolyMet would need nearly 700 tons of ore to make enough tailings for a *single* field test area.<sup>155</sup> And as Radue pointed out, 700 tons of ore “is enough to fill on the order of 10 to 15 semi-truck loads.”<sup>156</sup> That much ore “would require implementation of mining to retrieve, followed by transport to and from a pilot scale plant, the nearest of which is in Sudbury, Ontario Canada.”<sup>157</sup> Beyond that, “700 tons of ore is not readily available at the ground surface, so additional waste rock removal and stockpiling would be required to obtain the ore.”<sup>158</sup> In short, it is impossible to produce “[e]nough tailings representative of the full-scale steady state operations . . . until after permitting is complete.”<sup>159</sup>

These practical problems are the reason the ALJ’s conditions propose “surrogate” tailings. But any such surrogates would not have the same chemistry as the

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<sup>153</sup> Tr. Vol. 1 at 152:9–25 (Radue); Ex. 75 at 660–676, 754–760 (Radue Rebuttal); *see also* Ex. 74 at 789–794 (Radue Direct).

<sup>154</sup> Tr. Vol. 1 at 152:9–25 (Radue); Ex. 75 at 660–676, 754–760 (Radue Rebuttal); *see also* Ex. 74 at 789–794 (Radue Direct).

<sup>155</sup> Ex. 75 at 660–676 (Radue Rebuttal); Tr. Vol. 1 at 152:9–13 (“In order to do this, the field testing, we need hundreds of tons of tailings to test. There’s a small quantity of tailings from the pilot plant, which does not constitute hundreds of tons. There’s insufficient volume to test.”) (Radue).

<sup>156</sup> Ex. 75 at 667–668 (Radue Rebuttal).

<sup>157</sup> Ex. 75 at 667–670 (Radue Rebuttal).

<sup>158</sup> Ex. 75 at 670–672 (Radue Rebuttal).

<sup>159</sup> Ex. 75 at 660–676 (Radue Rebuttal); *see also id.* at 754–793.



NorthMet tailings. So even if enough taconite tailings were sorted to simulate the NorthMet tailings' particle size, their inconsistent chemical makeup would not allow the study to evaluate the full effects of the NorthMet tailings. That is why the best time for field testing is after the project starts to generate flotation tailings but before full-scale amendment of the beaches.<sup>160</sup>

In any case, the point of testing is to customize the bentonite application to site-specific conditions.<sup>161</sup> The 2019 Work Plan thus proposes a year of lab and field testing of the dam amendment before the start of dam construction, and continued field-testing during construction and operations to evaluate long-term effects and site-specific environmental conditions.<sup>162</sup> Similarly, beach and pond bottom field testing could be started in mine year 1, once the NorthMet tailings are available, with up to two decades of testing prior to the necessary amendments occurring at full scale.<sup>163</sup> That is enough testing to ensure that the bentonite amendment will work as planned.

PolyMet's experts provided ample testimony opposing the proposed large-scale field testing of flotation tailings, and no testimony explains how the proposed testing will supply substantial evidence to support modifying those conditions.

**B. Revised Condition 89c should apply only if testing does not meet standards.**

The ALJ's recommended Revised Condition 89c requires "a revised facility plan" if any "confirmation testing" on the dam sides shows that the bentonite "would

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<sup>160</sup> Ex. 74 at 635–655 (Radue Direct).

<sup>161</sup> Ex. 75 at 802–806 (Radue Rebuttal); *see also* Ex. 74 at 527–533 (Radue Direct).

<sup>162</sup> Ex. 75 at 825–828 (Radue Rebuttal); Ex. 293 at 0715222–23.

<sup>163</sup> Ex. 74 at 635–646 (Radue Direct); *see id.* at 527–533; Ex. 75 at 166–170, 830–831 (Radue Rebuttal); Ex. 293 at 0715213.

not achieve the necessary condition(s)” for meeting “applicable standards.”<sup>164</sup> That makes sense. But the revised condition also contains a final sentence that flatly says “A revised facility plan must be approved by DNR . . . prior to the initiation of NorthMet tailings dam construction.”<sup>165</sup> This final sentence is ambiguous, but it could be read to require a revised facility plan before construction even if testing shows that the bentonite amendment will meet applicable standards. Because such a requirement would be unnecessary to achieving DNR’s goals, PolyMet does not believe it is meant to be read this way.

For the sake of clarity, PolyMet proposes modifying the last sentence of Revised Condition 89c to say, “*If needed based on this condition, a revised facility plan must be approved by DNR and any other applicable regulatory authorities prior to the initiation of NorthMet tailings dam construction.*” (New language appears in italics.) This modification fits with the first part of this Condition, which requires a revised plan “[i]f any of the confirmation testing of bentonite amendment . . . reveals that the planned use of bentonite would not achieve the necessary condition(s).” But if the confirmation testing reveals that the planned use of bentonite *would* achieve the necessary conditions, then PolyMet should be able to continue with the original facility plan without approval of a revised facility plan.

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<sup>164</sup> OAH Record at 1371, MNDNR Proposed Findings of Fact and Recommendations, at 35.

<sup>165</sup> OAH Record at 1371, MNDNR Proposed Findings of Fact and Recommendations, at 35.

**C. Revised Condition 89d should allow flexibility in bentonite deposition.**

The ALJ's recommended Revised Condition 89d governs testing under the Tailings Basin Beaches Workplan. The last sentence of Revised Condition 89d(3) requires "testing means of incorporation of bentonite into the NorthMet tailings beaches (*including blending prior to spigotting tailings onto the beach*), as appropriate."<sup>166</sup> The italicized parenthetical language suggests that PolyMet specifically blend bentonite into the tailing before it spigots those tailings onto the beach. For two reasons, the Commissioner-designee should modify or reject the italicized parenthetical. First, such blending is unnecessary from an engineering, operations, and quality assessment/quality control perspective. Second, it raises safety concerns for personnel and equipment.

The bentonite amendment of the beaches is planned for the reclamation phase.<sup>167</sup> But if PolyMet had to apply the bentonite amendment via spigotting, it would have to do so during the operational phase. Spigotting the bentonite-amended tailings at that phase would limit control in achieving the blend ratio and application thickness determined necessary from lab and bench testing. For example, spigot-blended tailings would fan out on the beaches. Some would be discharged into the pond. The result would be more bentonite right below the spigot and gradually less bentonite farther from the spigot, leaving an uneven thickness across the beaches.<sup>168</sup> Spigotting would also force plant operations to stop during

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<sup>166</sup> OAH Record at 1372, MNDNR Proposed Findings of Fact and Recommendations, at 36 (emphasis added).

<sup>167</sup> Ex. 215 at 0067831.

<sup>168</sup> Ex. 293 at 0715213. PolyMet will conduct field testing of the bentonite amendment of the beaches ("flotation tailings will be spigotted along the south side crest of the

quality assessment and quality control testing of the application thickness. This stop-and-go process would unreasonably hurt plant operations. On top of all that, Revised Condition 89d(3) also raises safety concerns for personnel and equipment because mixing bentonite with tailings inside the plant could clog pumps, pipelines, or spigots.

For all these reasons, PolyMet asks the Commissioner's Designee to modify or reject the part of Revised Condition 89d that suggests "blending prior to spigotting tailings onto the beach."

**D. Revised Condition 89f should apply only if testing does not meet standards.**

Much like Revised Condition 89c, Revised Condition 89f's last sentence flatly states that "[a] revised facility plan must be approved by DNR in order to continue mining operations beyond Mine Year 6."<sup>169</sup> This sentence does not fit with the rest of the condition, which requires PolyMet to submit a revised facility plan if testing shows that bentonite on the beaches or pond bottom "would not achieve the necessary condition(s)" for operating the facility "in a manner that meets all applicable standards."<sup>170</sup>

PolyMet does not think that the ALJ meant to require a revised facility plan even if testing shows that the bentonite amendment *can* meet the applicable standards. So it proposes changing the last sentence of the condition to say: "*If needed*

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Cell 1E/2E splitter dam for use as a field test area during the initial year of flotation tailings deposition, with field testing to be initiated following establishment of the field-test beach area."); *see id.* at 0715213; *see also* Ex. 105 at 105.0634.

<sup>169</sup> OAH Record at 1373-74, MNDNR Proposed Findings of Fact and Recommendations, at 37-38.

<sup>170</sup> OAH Record at 1373-74, MNDNR Proposed Findings of Fact and Recommendations, at 37-38.

*based on this condition, a revised facility plan must be approved by DNR in order to continue mining operations beyond Mine Year 6.*” (New language in italics.) As with the change to Revised Condition 89c, this change would let PolyMet keep its original facility plan if testing shows that its original plan will work.

**E. The Commissioner’s Designee should modify or reject Revised Condition 89g to provide clarity on the deadlines.**

Revised Condition 89g also needs modification to avoid confusion. As written, it says that “[e]ach bentonite amendment adaptive management plan must be revised as needed to receive DNR approval by March 31 of the year following its submittal.<sup>171</sup>” This language could cause confusion as to what is due by March 31—the DNR approval or PolyMet’s revised plan. For the sake of clarity, PolyMet proposes the following modification:

Each bentonite amendment adaptive management plan must be revised as needed *within 60 days of receipt of DNR comments for final DNR approval* ~~by March 31 of the year following its submittal.~~

PolyMet is also open to other changes that accomplish the same ends.

**IV. The Commissioner’s Designee should reject the ALJ’s dicta about acid rock drainage.**

Finally, PolyMet objects to dicta related to acid rock drainage that the ALJ included in his Summary of the Case and Memorandum. There, the ALJ suggests that that the NorthMet tailings “could release acid rock drainage that may seep into nearby surface or ground water.”<sup>172</sup> That dicta contradicts the uncontested evidence

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<sup>171</sup> OAH Record at 1374, MN DNR Proposed Findings of Fact and Recommendations, at 38.

<sup>172</sup> OAH Record at 8, 35, ALJ report at 2, 29.

presented during the contested case hearing that the tailings will not cause acid rock drainage.<sup>173</sup>

The ALJ did not find any facts specific to the potential for acid rock drainage. Indeed, many of the ALJ's findings related to Issue No. 4 show that the pond-water chemistry will not result in acid rock drainage. For instance, the ALJ noted bentonite's ability to swell and expand "even if subject to a large amount of cation exchange."<sup>174</sup> The ALJ further found that "[m]odeling forecasts specific to the North-Met Project indicate that the tailings' pond water would have a relatively low ionic strength, and that it will be reduced further over time, such that it is not anticipated to result in consequential levels of cation exchange."<sup>175</sup> And the ALJ found water contacting the bentonite amendment on the beaches and dam sides—mainly precipitation and pore water—will also have low ionic strength.<sup>176</sup> Again, the ALJ found that this "low ionic strength . . . will result in limited cation exchange."<sup>177</sup> These facts,

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<sup>173</sup> It is true that waste rock—larger pieces of unprocessed rock that are removed from the pit during mining—could generate acid when exposed to oxygen. Ex. 217 at 0034430–31 ("Waste Rock Management Concept"); Ex. 219 at 0115577, ¶¶ 225–226. But such waste rock is not stored in the tailings basin. Ex. 219 at 0115577–78, ¶¶ 226, 230, 231. Indeed, tailings and waste rock are two different things, and the unchallenged hearing evidence shows that when the beneficiation process creates tailings, it eliminates the potential for acid generation. Ex. 78 at 131–155, 186–207 (Dietrich Direct); Ex. 79 at 4–11, 34–41 (Dietrich Rebuttal); Ex. 103 at 9, Lines 9–12 (Engstrom Rebuttal); *see also* Exs. 39, 46; Ex. 78 at 121–435.

<sup>174</sup> OAH Record at 22, ¶ 80, ALJ report at 16 ¶ 80.

<sup>175</sup> OAH Record at 23, ALJ report at 17, ¶ 86.

<sup>176</sup> OAH Record at 23, ALJ report at 17 ¶ 87; Ex. 79 at 228–63 (Diedrich Rebuttal); Tr. Vol. 3 at 44:15–45:4 (Diedrich).

<sup>177</sup> OAH Record at 24, ALJ report at 18 ¶90.

PolyMet’s expert testified, show a neutral environment without the potential for acid rock drainage.<sup>178</sup>

Beyond all that, the ALJ heard evidence that there is “not an acid waste rock drainage situation at the NorthMet Project.”<sup>179</sup> PolyMet’s experts testified that the flotation tailings do not pose a risk of acid rock drainage based on data showing that the tailings have continued to produce non-acidic drainage throughout 17 years of kinetic testing, which accelerates the rate of oxidation for the scientists to observe changes in trends in the data over time.<sup>180</sup> In that regard, Diedrich observed that the pH of drainage in the testing “has been stable to trending upwards with time (the opposite of becoming acid). There is no indication that this trend will change, as the remaining sulfide minerals are being depleted with time.”<sup>181</sup> The petitioners’ experts, on the other hand, did no modeling or testing specific to the NorthMet Project to prove any acidity or likelihood of acid mine drainage.<sup>182</sup>

Because the ALJ’s statements about acid rock drainage are unsupported by substantial evidence in the administrative record—and in fact, the record shows the opposite—the Commissioner’s Designee should reject the ALJ’s dicta regarding acid

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<sup>178</sup> Tr. Vol. 3 at 32:13–23, 35:13–19, 42:15–43:1, 44:15–45:4, 45:13–17 (Dietrich); Ex. 78 at 45–96, 116–118, 186–207, 423–432 (Dietrich Direct); *see id.* at 131–155; Ex. 79 at 1–11, 71–99, 176–197, 336–342 (Dietrich Rebuttal).

<sup>179</sup> Ex. 75 at 70–73 (Radue Rebuttal).

<sup>180</sup> Ex. 74 at 93–101 (Radue Direct); Ex. 78 at 152–159, 186–201, 425–428 (Dietrich Direct); Ex. 79 at 1–11 (Diedrich Rebuttal).

<sup>181</sup> Ex. 79 at 1–11 (Diedrich Rebuttal); Ex. 50.

<sup>182</sup> Neither Kuipers nor Thyne offered an opinion in this case about cation exchange. Tr. Vol. 4 at 46:406 (Kuipers), 208:9–16 (Thyne). Malusis did not perform any modeling or testing, nor did he quantify how much any cation exchange could impact the hydraulic conductivity of the bentonite-amended tailings over time. Tr. Vol 4 at 60:15–18, 61:20–62:3, 62:4–7, 63:3–15; 63:21–24, 64:18–25 (Malusis).

rock drainage and find that the NorthMet tailings will not generate acid rock drainage.

## CONCLUSION

PolyMet asks the Commissioner's Designee to issue a final decision in this contested case, under Minnesota Statutes 14.61 through 14.63, that:

- Affirms the ALJ's findings on the five fact issues under the DNR's February 14, 2022 contested case hearing notice and order;
- Rejects or modifies the ALJ's interpretation of Minnesota Statutes section 93.481, subd. 2, and determines that the NorthMet Project's use of bentonite is a practical and workable reclamation or restoration technique under available technology;
- Rejects or modifies the ALJ's interpretation of the Rule and finds that the NorthMet Project satisfies Minnesota Rules 6132.2200, subp. 2(B)(1);
- Rejects or modifies the ALJ's interpretation of the Rule and finds that the NorthMet Project satisfies Minnesota Rules 6132.2200, subp. 2(B)(2);
- Rejects or modifies the ALJ's recommendations for some newly revised conditions; and
- Rejects the ALJ's statements about acid rock drainage and finds that the NorthMet tailings will not produce acid rock drainage.



Respectfully submitted,

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