

Appendix B – Responses to Fond du Lac Band and Branfireun Comments

The Fond du Lac Band of Lake Superior Chippewa was involved in the environmental review for the NorthMet Project from the beginning. Throughout, the Band expressed concerns over potential mercury, methylmercury, and sulfate impacts to water quality. The Minnesota Department of Natural Resources, U.S. Army Corps of Engineers, and U.S. Forest Service addressed those concerns in the Project’s Final Environmental Impact Statement, which included a special chapter devoted to “major differences of opinion” between the agencies and the tribal cooperators. Yet the Band continued raising the same basic issues during the Project’s permitting processes—including as part of the Minnesota Pollution Control Agency’s section 401(a)(1) certification process, where it focused specifically on the Project’s potential downstream water quality effects.¹

This appendix addresses Fond du Lac’s criticisms of MPCA’s section 401 certification and the Cross-Media Analysis, as well as more recent criticism from an outside expert on which the Band has relied before.

A. The Band’s section 401 comments

MPCA’s section 401 [Findings of Fact, Conclusions of Law, and an Order](#), contains detailed analysis of the commenters’ arguments, many of which criticized the Cross-Media Analysis. Below, PolyMet summarizes relevant findings from the 401 Order that respond to the Band’s criticisms. The “FDL Comment” number that follows each issue is identical to MPCA’s comment number.²

- 1. As a downstream water quality regulatory agency, FDL is specifically concerned about this project’s potential for further degradation of our most important on-reservation fishery, the St. Louis River. Any additional releases of mercury, or loadings of sulfate that enhance downstream methylation of mercury or bioaccumulation in fish, is an unacceptable violation of our water quality standards authority. (FDL Comment 373)*

¹ The Band’s section 401 arguments substantially overlapped with comments made by other parties. Several of those other parties requested that MPCA hold a contested case hearing before issuing a section 401 certification, though the Band did not.

² Exhibit 3 to this filing is an excerpt from MPCA’s spreadsheet identifying comments it received relating to the draft 401 certification. This excerpt includes MPCA’s numbering of the Band’s comments (numbers 367-424). The Band’s March 16, 2018 comment letter is included as Exhibit 4.

2. *FDL disagrees with the conclusion from the SDEIS and FEIS that the net effect of the Project is to cause a reduction of mercury loading into the St. Louis River as compared to existing conditions. (FDL Comment 374 and 377)*

These comments reflect the Band's concern that the Project will cause violations of its water quality requirements. As the FEIS showed, the Project will actually produce a net reduction in mercury loading to the St. Louis River. [Final Environmental Impact Statement](#) at 5-10, A-413. To address the Band's concern that the FEIS did not evaluate all potential sources of mercury and methylmercury, MPCA and PolyMet developed the Cross-Media Analysis as part of the section 401 certification process. The Cross-Media Analysis provides an even more in-depth evaluation of the potential changes in sulfate, mercury, and methylmercury in the immediate vicinity of the project and in downstream waters. That analysis confirms that the Project will result in a net *reduction* in sulfate and mercury loading to the St. Louis River.

3. *FDL claims that PolyMet has not proved it can meet a mercury discharge limit of 1.3 ng/L in its WWTP discharges, and objects to the absence of such a mercury limit and related mercury treatment/removal requirements in the NPDES/SDS permit for WWTP discharges. (FDL Comment 382, 408-409)*

MPCA explained in its section 401 Findings of Fact why these allegations concerning the mercury discharge limit are inaccurate: "The EIS concluded that the demonstrated ability of the NorthMet tailings to adsorb mercury, in combination with the previously documented mercury removal capabilities of the underlying taconite tailings, would be expected to result in an overall increase of mercury adsorption and subsequently lower concentrations of mercury in [tailings basin] seepage. . . . Thus, the influent of the WWTS³ is expected to be approximately equal to the mercury water quality standard of 1.3 ng/L. The MPCA expects further removal by the greensand filtration and reverse osmosis components of the WWTS [N]o new information is presented [by any commentators or others] that would lead MPCA to conclude the testing was invalid or to disagree with conclusion presented in the EIS." 401 Findings of Fact ¶ 104.⁴

Further, "[t]o address concerns regarding mercury in the WWTS discharge, the MPCA has added to the NPDES/SDS permit an internal operating limit of 1.3 ng/L for mercury, additional dissolved mercury monitoring, and requirement to submit a Mercury

³ WWTS is an abbreviation for "wastewater treatment system," the name for the system that will treat and discharge water from the project.

⁴ PolyMet has obtained mercury data from Eagle Mine, a copper-nickel mine in Michigan. Both of Eagle Mine's treatment plants use reverse osmosis membrane treatment for mercury removal to meet their permit limit of 0.5 ng/L. PolyMet is planning to use the same type of treatment technology.

Minimization Plan in accordance with the Agency’s mercury strategy.” *Id.* ¶ 105. Contrary to the Band’s claims, MPCA can enforce this internal operating limit.

4. *FDL claims that MPCA made the following errors in analyzing impacts of sulfate, mercury, or methylmercury impacts attributable to the Project:*
 - a. *MPCA failed to adequately consider the amount of mercury release attributable to ground (surface) disturbance that will be caused by the Project. The presence of peat in overburden to be removed is cited as an example of potential mercury releases not accounted for by MPCA. (FDL Comment 403, 405)*
 - b. *In evaluating mercury impacts attributable to the Project, MPCA failed to properly account for seepage of contaminants from the Project (e.g., from the FTB) into groundwater hydrologically connected to surface waters. (FDL Comment 406, 408, 409)*

MPCA addressed comments similar to these in its section 401 Findings of Fact. There, MPCA explains that PolyMet will address the potential impacts caused by Project-related ground disturbance by collecting the runoff at the mine site and plant site from all areas affected by mining activity and using it in the NorthMet production process. Collecting Project-affected water, including water from the Overburden Storage and Laydown Area (where peat and unsaturated mineral overburden will be stored) and using it in the Flotation Tailings Basin will ensure that there will not be elevated levels of mercury and sulfate in these waters. In addition, seepage from Project features was evaluated as part of the non-degradation evaluation for the SDS portion of the NPDES/SDS permit.⁵ Both the change in watershed runoff (resulting from use of the mine water) and the seepage losses from Project features were accounted for in the Cross-Media Analysis.

The agency rejected claims that the Cross-Media Analysis did not properly account for seepage or other releases from the Project, including the tailings basin, hydromet facility, waste rock stockpiles, ponds, and other potential pollutant sources. 401 Findings of Fact ¶¶ 82-86, 99-102. MPCA’s findings explain that the Band’s seepage claims (and similar ones involving ponds, liners, and other pollution-control features) are “premised on an unfounded assumption that the engineering controls for the alleged seepage sources will not work as designed or will fail in the future. . . .” *See, e.g., id.* ¶ 83. Lacking evidence to support these claims that that the Project’s features would not work as designed, MPCA rejected the commenters’ claims. *Id.* ¶ 104.

- c. *MPCA failed to require PolyMet to adequately store hydrometallurgical waste. Additionally, PolyMet’s NPDES/SDS permit allows mercury discharges*

⁵ See MPCA, [NPDES/SDS Permit Program Fact Sheet](#), NorthMet Project at 87-88 & Attachment 4.

of 1,000 ng/L and 2,000 ng/L, which exceeds the Great Lakes Initiative standard. (FDL Comment 407)

The hydrometallurgical residue facility foundation was appropriately designed by a licensed engineer and has been reviewed and approved by both the DNR's dam safety engineers and DNR's third party contractors, as well as by the MPCA NPDES/SDS permit engineers and MPCA's third party geotechnical engineers. When these same allegations were raised during the EIS process, they were rejected. Later, the NPDES/SDS permit and the DNR dam safety permit imposed "requirements for a detailed process of investigation, design, and the MPCA approvals" to address the design and location concerns raised by commenters. *Id.* ¶¶ 83-84. Again, MPCA emphasized that the complaints about the hydromet facility are "based on the unfounded assumption that the issue associated with the HRF foundation will not be addressed and the liner system will fail." *Id.* ¶ 84

d. MPCA failed to require sufficient background information regarding the presence of total mercury and methylmercury in the environment in the vicinity of the Project, including surface water, groundwater, wetlands, and sediment. (FDL Comment 411)

When commenters criticized the background information on which MPCA relied the agency responded in detail. *See, e.g.,* Findings of Fact ¶¶ 149-150, 155-162, 166-170, 190-197.

Faced with criticism that the Cross-Media Analysis' reliance on the wetland of interest (WOI) was improper and that additional wetlands and receptors should have been analyzed for factors such as background pollutant concentrations, added concentrations, and load levels from the Project. MPCA explained that the WOI had "the highest rate of deposition [from the Project.] . . . The MPCA has no basis to believe a different site would be more susceptible to degradation by a smaller mass of deposition, and the comment provided no information to support such a position." Findings of Fact ¶ 191.

In response to complaints about the extent of baseline data with respect to on-site or nearby wetlands, MPCA "disagree[d] with the assertion that the limited baseline data precludes a meaningful analysis." The agency explained that it "does not have to wait until it acquires perfect information to make a decision. The MPCA used the best available data and determined that the data were adequate to make a reasonable decision." MPCA rejected the argument that other wetlands should have been considered, explaining that "[i]ndividual wetlands considered in the analysis were not unique or sufficiently different such that available data would not be reasonably representative. Having monitoring data specific to each wetland near [various Project locations] was not necessary for the overall analysis due to the protective assumptions that the MPCA used." *Id.* ¶¶ 194-195.

5. *FDL made the following specific criticisms of the Cross-Media Analysis:*

- a. *The Cross-Media Analysis excluded important pathways for mercury release and for mercury methylation associated with the Project, including seepage from the tailings basin and other project facilities, stormwater discharges from the Project, and direct loading of inorganic mercury from the Project into nearby wetlands. FDL also criticizes the reliance on monitoring locations approximately one mile north of the FTB at Trimble Creek and Unnamed Creek rather than at the wetlands at the toe of the tailings basin. (FDL Comment 416-418)*

MPCA's rejection of these seepage claims is discussed above in connection with FDL Comments 406, 408, and 409. Again, neither the Band nor anyone else has provided evidence to support their claims that PolyMet's designs for seepage capture and treatment will not work.

This comment also mischaracterizes PolyMet's handling of non-contact stormwater. PolyMet defines non-contact stormwater as precipitation and runoff that contacts natural, stabilized, or reclaimed surfaces and has not been exposed to mining activities, construction activities, or industrial activities. So the Band is wrong when it states in its October 2018 comment letter that non-contact stormwater "will not be managed to prohibit the release of dissolved or suspended contaminants to surrounding surface waters, including wetlands." All stormwater on PolyMet's mine site will be routed through stormwater ponds specifically designed in accordance with MPCA's industrial stormwater general permit to treat dissolved and suspended contaminants. These ponds will become a sink for total suspended solids, including particles that may contain mercury.

MPCA also explained in its section 401 Findings of Fact why, even though the modeled deposition in the Cross-Media Analysis showed that stormwater could be affected, the Analysis still included the impacts of mercury and sulfate from stormwater runoff. 401 Findings of Fact ¶¶ 95-97. The Cross-Media Analysis, MPCA said, "was specifically designed to account for the deposition reaching the wetland of interest, including deposition on uplands. The assumption was made that *all* runoff from uplands will contribute to the wetlands." *Id.* ¶ 96 (emphasis added). This is one of many protective assumptions in the Cross-Media Analysis.

The Band was also wrong to say that the Cross-Media Analysis did not include direct surface water drainage to wetlands and streams or impacts of loading inorganic mercury to wetlands in its cumulative impact analysis. The Cross-Media Analysis was developed specifically to evaluate the impacts of mercury loading from Project air deposition to both wetlands and uplands. To that end, the Analysis made a protective assumption that uplands would contribute equally to methylmercury loading to downgradient areas. See Cross-Media Analysis Table 3-3. Cross-Media Analysis Section

4.2 described the potential Project sulfur deposition and effects on methylmercury concentrations, including the change in loading of sulfate across the mine site and plant site and the estimated potential change in methylmercury concentrations from this loading. Cross-Media Analysis Figure 6-1 shows that the study analyzed loading to the entire Partridge River watershed via evaluation point SW004 (which includes all of the mine site) and to the entire Embarrass River watershed via evaluation point PM-13 (which includes all of the plant site).

To address claims that it ignored direct loading into wetlands, MPCA pointed out that it had “considered the issue and concluded that the project would not have an effect on the loadings of inorganic mercury into wetlands or mercury impairments.” The agency reached that conclusion by “considering the relative impact, based on its experience in other wetlands in northern Minnesota, and [finding] the mercury deposited into these wetlands, including inorganic mercury, is predominately atmospheric deposition. Because MPCA “considered the effects from project emissions, including inorganic mercury, and concluded deposition would be minimal,” it concluded that “the degree or extent of existing impairments is not expected to change.” 401 Findings of Fact ¶¶ 107-109; *see also id.* ¶¶ 149-170 (discussing other complaints about the Cross-Media Analysis not appropriately evaluating impacts from air deposition at the mine site and plant site).

- b. *The Cross-Media Analysis did not consider the consequences of drying and rewetting of wetlands implicated by various Project activities. (FDL Comment 419)*

There is no factual basis for this allegation. Cross-Media Analysis Section 4.4.3.2 specifically addressed annual water level fluctuations, including during drought years, and the effect of such fluctuations on potential export of sulfur and methylmercury. MPCA explained this in its section 401 Findings of Fact, which describe how the Cross-Media Analysis accounted for the potential downstream water-quality effects of drying and rewetting of wetlands, including the protective assumptions about mineral reaction rates in various oxidate conditions and its evaluation of the potential impacts of drying and rewetting of peat-containing overburden stored at the NorthMet site. 401 Findings of Fact ¶¶ 114-120. MPCA also rejected claims that the Cross-Media Analysis did not consider drought cycles and seasonal fluctuations in water levels, explaining that “the issue of seasonal fluctuations in wetland water levels in the WOI was specifically considered in the cross-media analysis through the development of a water balance model for the WOI based on water level data available from the WOI.” According to MPCA, this “level of analysis was sufficient to estimate the potential overall effect on water quality in the area of highest dust deposition.” Further, MPCA noted, “water level fluctuations are not expected to change because the watershed area will not change substantially [due to the Project].” *Id.* ¶¶ 228-229.

- c. *The Cross-Media Analysis failed to evaluate mercury air deposition in the immediate proximity of the plant site (specifically deposition from the plant*

site stack emissions) and instead used as the closest evaluation point a monitoring location MNSW8 approximately 11 miles away on Second Creek. (FDL Comment 420)

This comment also misses basic facts about the Cross-Media Analysis. Cross-Media Analysis Large Figure 8 shows the receptor grid at the Plant Site, which included receptors across the entire the plant site and beyond. MPCA agreed that the use of a monitoring location at Second Creek was appropriate for purposes of the Cross-Media Analysis in its section 401 Findings of Fact. See ¶¶ 146-148 (noting that “modeling [for the Cross-Media Analysis] evaluated contributions of mercury (which were primarily elemental, but also ionic and particulate) from the autoclave” and concluding that “[t]he evaluation point downstream on Second Creek was selected to reflect the cumulative effects of potential emissions sources from the Plant Site”).

6. *FDL states that the conclusion in the Cross-Media Analysis showing a “measurable change” (i.e., increase) in water column methylmercury at Second Creek resulting from Project construction is evidence of violations of federal and state water quality standards. (FDL Comment 420)*

It is not true that the Cross-Media Analysis evidences violations of water quality standards. But even if this comment were accurate, it would be irrelevant to section 401(a)(2)’s downstream water quality effects inquiry. The Cross-Media Analysis demonstrated that the few predicted measurable increases in parameter concentrations at certain monitoring locations (i) were limited to locations in close proximity to the Project, (ii) did not violate any federal or state water quality standards, and (iii) would not be present downstream at the Forbes monitoring location or further downstream—including at the Fond du Lac Reservation. See Cross-Media Conclusions and Recommendations at 2; 401 Certification Fact Sheet at 14.

7. *FDL claims that PolyMet has not proven it will comply with all applicable pollution control statutes and rules, or the conditions of the permit. (FDL Comment 378, 379, 424)*
8. *FDL claims that the State has not proven its permitting agencies will enforce applicable pollution control limits applicable under statutes, regulations, and permits. (FDL Comment 424)*

There is no reason to believe that MPCA and the other permitting agencies with authority over PolyMet’s Project would not fulfill their regulatory responsibilities. Nor is there any reason to question PolyMet’s intent to abide by the terms of its permit. If those sorts of doubts were reason to find a downstream water quality violation, one could be found in every case. A downstream water quality decision should be based on evidence establishing the potential for a violation of water quality requirements. There is no such evidence in this case. To the contrary, the evidence shows that no downstream water quality violations will occur.

9. *FDL also adopts the comments provided in the report of Branfireun on behalf of WaterLegacy relating to the FEIS. (FDL Comment 414)*

Branfireun provided commentary and opinion in 2014⁶ on the SDEIS, in 2015⁷ on the FEIS, and in 2019⁸ after MPCA had completed its section 401 permitting. The 2019 report, which incorporated a number of Branfireun's earlier comments, appears intended to address the section 401 certification process, but does not seem to have been submitted to any government agency.⁹ To PolyMet's knowledge, Branfireun was never asked to opine on the question of whether the Project could cause violations of the Band's water quality requirements. PolyMet has seen nothing in Branfireun's reports to suggest that he is even aware of the Band's water quality requirements, much less that he has conducted any site-specific analysis of the quality of waters within the Fond du Lac Reservation or of the project's potential impacts to reservation waters.

Nonetheless, since the Band specifically referred to Branfireun in its 2018 letter regarding the section 401(a)(2) process, PolyMet responds to Branfireun's most recent comments below.

B. 2019 Branfireun report

Branfireun acknowledged in his 2019 report that the conclusions in the Cross-Media Analysis "concerning the relative loads of sulfur to wetlands in the proximity of the project are conceptually sound." 2019 Branfireun at 4. He also admitted that he has "no criticism of the factors reflected in the analysis [of atmospheric dry deposition] as far as it went." *Id.* Branfireun further conceded that the scope of the Cross-Media Analysis "allows for a scientifically defensible consideration of the potential impacts on water quality," and described the Cross-Media Analysis as "thorough in its consideration of the literature highlighted in my previous opinions and other works that speak to wetland cycling of sulfur, mercury, and methylmercury." *Id.* Given those statements, Branfireun's criticisms

⁶ Expert Opinion of Brian A. Branfireun, PhD Concerning the NorthMet Mining Project and Land Exchange Supplemental Draft Environmental Impact Statement. March 10, 2014.

⁷ Final Draft. Expert Review of Brian A. Branfireun, PhD. Of the NorthMet Mining Project and Land Exchange Final Environmental Impact Statement. Dec. 2, 2015.

⁸ Exhibit 6, Brian A. Branfireun, PhD. Expert Review of the Minnesota Pollution Control Agency Clean Water Act Section 401 Certification for the NorthMet Project. Jan. 20, 2019.

⁹ It is unclear to PolyMet whether WaterLegacy, which sponsored this 2019 report, ever submitted it to any agency. PolyMet reserves its right to argue that this untimely report cannot now be considered as part of the remanded section 401 certification process or any subsequent Clean Water Act section 404 proceedings. In the interest of scientific accuracy and completeness, PolyMet is responding to the 2019 Branfireun report without waiving these objections.

of the Cross-Media Analysis’s conclusions are limited to the study’s scope, including its supposed omission of sources of mercury and methylmercury. Those criticisms do not withstand scrutiny.¹⁰

- A. *Limiting sulfur loading to dust deposition in the single wetland of interest fails to account for environmental risks from hydrologic changes at the mine site, aqueous sulfate releases, and mercury air deposition to wetlands. (2019 Branfireun, § 2.1.1)*

Branfireun erroneously stated that the Cross-Media Analysis only took into account atmospheric dry dust deposition of sulfur loading on the wetland of interest and suggested that PolyMet should have also accounted for “hydrologic changes that will affect other mine site wetlands, aqueous sulfate releases, and mercury air deposition to wetlands.” In fact, the Cross-Media Analysis is a cumulative effects evaluation that accounts for all major sources of potential air and water impacts. It evaluated sulfur loading from Project air deposition, including stack, tailpipe and fugitive emissions—not just to the wetland of interest, but also to uplands, wetlands, and other water bodies across the entirety of the St. Louis River watershed headwaters (see Cross-Media Analysis Large Figures 3, 7, 8, and 9), as well as the wastewater discharges and other Project actions that may affect downstream water quality.

The term “WWTS discharge and other Project actions” was defined in the Cross-Media Analysis to include the WWTS discharge, the operation of tailings basin seepage capture systems, Project watershed changes, and use of make-up water from Colby Lake.¹¹ Similarly, the section 401 and NPDES antidegradation analyses used the phrase “WWTS discharge and related activities” to mean activities that “affect the quality and quantity of that discharge”. Surface Water Antidegradation Evaluation at 1, 401 Antidegradation Assessment at 3. As described on page 27 of the Cross-Media Analysis, the “cumulative effects evaluation for sulfate and mercury builds on the results of the NorthMet NPDES Surface Water Antidegradation Evaluation.” Page 115, Section 5 of the Cross-Media Analysis provides the results of the cumulative effects analysis, explaining that the study included the “potential effects from atmospheric loading from air emissions plus the flow

¹⁰ To supplement these responses, PolyMet is providing a declaration prepared by Cliff Twaroski of Barr Engineering, the primary author of the Cross-Media Analysis. See Exhibit 1, Declaration of Cliff Twaroski. Twaroski’s declaration addresses the comments in the 2019 Branfireun report and explains the errors and misunderstandings in the report. Twaroski’s credentials and experience, including over 35 years of environmental, human health, and ecological risk assessment work in private and public practice, are described in his declaration.

¹¹ “Other Project actions include operation of the FTB seepage capture systems [which cut off seepage from the tailings basin], the effects of watershed changes at the Mine and Plant Sites [collection of waters impacted by mining activities for use by the Project], and the effects of withdrawing make-up water from Colby Lake [which has a high concentration of mercury].” Cross-Media Analysis at 115.

and load changes associated with the WWTS discharge and other Project actions that will affect downstream water quality and quantity.”

Branfireun apparently missed these plain statements explaining how the Cross-Media Analysis accounted for all air- and water-related sources of potential downstream impacts.¹²

B. Sulfate and mercury loading from direct discharge from the WWTS and seepage to wetlands from the tailings basin has not been evaluated properly because of the focus on the wetland of interest rather than the wetlands to the north of the tailings basin. (2019 Branfireun, § 2.1.2)

The primary purpose of the Cross-Media Analysis was to provide a cumulative effects analysis of the potential Project impacts, including the potential impacts of sulfide mineral dust deposition. The Cross-Media Analysis’s review of potential air impacts was not required by the Clean Water Act or Minnesota law, but PolyMet and MPCA agreed that such a comprehensive review was valuable here, in part to address the Band’s concerns about downstream water quality. But that does not mean that seepage and WWTS discharges were improperly evaluated. Those sources and other water-related Project actions were indisputably included in the cumulative effects analysis in Section 5 of the Cross-Media Analysis—including their potential impacts not only to the wetlands north of the plant site, but to other wetlands and waters in the receptor areas in the St. Louis River watershed as described above. By focusing on the potential for WWTS discharges to add to ongoing seepage from the existing tailings basin, Branfireun ignores the fact that the Project will cut off existing seepage from the tailings basin. That seepage (average concentrations of 234 mg/L sulfate and 4.9 ng/L mercury, FEIS Table 4.2.2-23) will be replaced with a similar volume of treated discharge (maximum concentrations of 10 mg/L sulfate and 1.3 ng/L mercury).

PolyMet’s 401 certification and water appropriation permits require that the WWTS discharges match +/-20% of the baseflow from headwater streams. 401 Certification at 6; Water Appropriation Permit 2016-1369 at 5. Cross-Media Analysis Table 5-1 identified the relevant evaluation points and contributing sources, showing the addition of the WWTS discharge. Table 5-5 and Table 5-6 show the additive load for mercury and sulfate, respectively, from the WWTS discharge. These two tables also establish the total reduction in concentration and load of mercury and sulfate in the Embarrass headwater streams. Branfireun appears to have missed this critical point.

Branfireun also stated that the Cross-Media Analysis ignored seepage from engineered features and relied on insufficient background data. WaterLegacy, which sponsored Branfireun’s reports, made similar claims in its petition opposing MPCA’s 401

¹² Twaroski discusses these issues in even more detail. See Exhibit I, Twaroski Decl. ¶¶ 9-24.

certification.¹³ Other commenters argued that the evaluation points in the Cross-Media Analysis missed the areas most likely to be impacted by the Project. MPCA rejected all of these arguments.¹⁴ See 40I Findings of Fact ¶¶ 82-87, 107-110, 149-150, 155-157, 166-168.

MPCA also expressly rejected Branfireun's assertions that the Cross-Media Analysis should have relied on additional site-specific evaluation of wetlands north of the plant site (the Embarrass headwaters) or south of the plant site (the Second Creek headwaters). MPCA explained that the available evidence showed that Project deposition of mercury and sulfide-bearing materials at these locations north and south of the tailings basin would be minimal in both total and relative terms, would be far less than in the WOI, and would be a minor fraction of airborne deposition from other (principally out-of-state) sources. 40I Findings of Fact ¶¶ 149-150, 155-157, 167-168, 190-192, 234-238.

In Findings of Fact ¶¶ 190-192, MPCA rebutted the claims of other commenters that the Cross-Media's reliance on analysis of the WOI was an over-simplification and that it ignored other relevant information such as background concentration, concentration and load levels from all PolyMet sources, flow, and water chemistry in other wetlands and streams near the Project. The identification of the WOI was for purposes of evaluating whether water quality standards in wetlands might be violated due to air-related impacts. But the Cross-Media Analysis's cumulative effects analysis in Section 5 went beyond the WOI to include potential contributions from all wetlands and other water bodies in the Partridge River and Embarrass River watersheds. On that basis, the Cross-Media Analysis calculated the effects of both air- and water-related releases on downstream water quality.

Finally, in Findings of Fact ¶¶ 193-197, MPCA rejected the claims of other commenters that additional baseline monitoring of wetlands near and on the Project site was necessary to properly evaluate downstream impacts. The agency explained that existing information showed that these wetlands "were not unique or sufficiently different such that the available data would not be reasonably representative," and that MPCA "considered the available data, including data from the same wetland complex as the WOI, and determined the data was sufficient to make a reasonable decision." *Id.* ¶¶ 195-196.

In short, MPCA rejected Branfireun's assertions that wetlands other than the WOI were ignored or needed more site-specific background data and analysis, as well as his

¹³ WaterLegacy Letter to MPCA "Comments Opposing MPCA Draft NPDES/SDS Permit (MN0071013), Comments Opposing MPCA Draft Section 40I Certification, Petition for Contested Case Hearing, In the Matter of the PolyMet NorthMet Copper-Nickel Mine Project." March 16, 2018.

¹⁴ Excerpts of MPCA's rebuttal of the criticisms of the Project design, including those relating to seepage collection and treatment, is described above in response to issues 4c and 5a.

unsupported hypothesis that those other wetlands could be greater sources of mercury and methylmercury impacts.¹⁵

C. The Cross-Media Analysis does not adequately address the impacts on wetlands and related hydrology due to mine pit dewatering because it does not use computer modeling to predict extent of mine site water table drawdown and resulting wetland impacts. As a result, there is no reasonable attempt to model potential changes in wetland hydrology as it relates to changes in water chemistry (especially on the export of sulfate and mercury and methylation of mercury) due to the Project. (2019 Branfireun, § 2.1.3)

Branfireun made this same criticism during environmental review (both at the SDEIS and FEIS stages), and then again in permitting via the WaterLegacy comments on the draft section 401 certification. 401 Findings of Fact ¶¶ 111-113. They appeared again in his 2019 report. MPCA has repeatedly rejected this position because the “available evidence does not support a significant drawdown occurring in wetlands adjacent to the project area that would lead to the effects in the comment.” 401 Findings of Fact ¶ 112.¹⁶

Branfireun conceded in his 2019 report that the Cross-Media Report does discuss water table drawdown at the mine site. His only material difference of opinion is the extent of that drawdown. *Compare* 2019 Branfireun at 7-8 and Findings of Fact ¶ 112. Neither Branfireun nor MPCA has contended that Branfireun’s preferred form of modeling—or any form of computer modeling—will predict the drawdown impact with specificity. That is why the state and federal agencies (MPCA, MDNR, and USACE) required wetland water level monitoring and other wetland monitoring conditions in their permits. 401 Findings of Fact ¶ 112.¹⁷

D. Monitoring required by the 401 certification and NPDES/SDS permit is insufficient to detect irreparable harm resulting from mercury release and methylation. (2019 Branfireun, § 2.2)

Some commenters criticized MPCA’s section 401 certification monitoring requirements, including the scope, locations and length of monitoring. Branfireun’s 2019

¹⁵ Twaroski also reviews these issues in great detail. *See* Exhibit 1, Twaroski Decl. ¶¶ 25-30.

¹⁶ Twaroski’s declaration (Exhibit 1 ¶¶ 31-35) further explains why MPCA’s reliance on an analog approach, rather than computer modeling, was both reasonable and consistent with Minnesota practice in evaluating mercury impacts on water quality.

¹⁷ Paragraphs 31-35 of Twaroski’s declaration (Exhibit 1) provide more details about why Branfireun’s claims contesting the adequacy of the Cross-Media Analysis are incorrect, including discussion of MPCA’s TMDL study decisions, prior EIS documentation, DNR’s past studies, and other research on the topic.

report essentially mirrors those comments. MPCA rejected arguments that insufficient numbers and types of wetlands were included in its monitoring requirements, that WOI monitoring was not adequate, that limitation of monitoring to pre-operational circumstances in some cases was improper, and that additional parameters should be added to the monitoring program. 401 Findings of Fact ¶¶ 198-211. The agency explained that the commenters had not demonstrated why the monitoring required by the section 401 certification “would fail to provide an adequate assessment of effects in any direction around the [Project] site.” *Id.* ¶ 205. MPCA specifically determined that its monitoring requirements for mercury, sulfate, and methylmercury ensure potential downstream water quality violations would be detected long before they would occur, allowing sufficient time to investigate the circumstances and implement adaptive management measures that would avoid any downstream violations. *Id.* ¶¶ 199, 203, 209.

Branfireun made no effort to explain how his proposed monitoring protocols would be practical. They read instead like an ongoing academic exercise—in essence, unbounded data collection forever from basically everything in the vicinity of the Project. In addition, the largely duplicative sampling sought by Branfireun would add substantial costs to the extensive sampling PolyMet already is required to undertake without any clear regulatory purpose, justification, or documented potential impacts.¹⁸ Branfireun similarly did not explain how his commentary on the potential effects of methylmercury on bats and birds is relevant to MPCA’s section 401 certification or to the potential for downstream water quality violations on the Fond du Lac Reservation.¹⁹

¹⁸ PolyMet’s extensive monitoring requirements for its section 401 certification, NPDES/SDS permit, and water appropriation permits include 31 surface water quality locations, 12 streamflow locations, 122 groundwater locations, 62 wetland locations, 11 surface water discharge locations, and 25 waste stream locations, as shown in Figure 6 of Appendix A. This creates a robust monitoring network with extensive baseline monitoring, including in some cases, monitoring location data sets that have been monitored since 2004, providing nearly 17 years of baseline data.

¹⁹ Regarding wetland monitoring, Branfireun appears to be satisfied with the fact that in addition to all of the surface and groundwater monitoring required by the NorthMet NPDES/SDS permit, MPCA in its 401 certification required sulfate, mercury, and methylmercury monitoring in *22 separate wetlands*. See 2019 Branfireun at 9. Nonetheless, he criticized the length of the monitoring, purporting to read implicit recommendations into the memorandum supplied by MPCA’s Dr. Bruce Monson (MPCA’s mercury expert) *Id.* at pages 9-10. Given that Monson was an active participant in the design of the Cross-Media Analysis and MPCA’s review and response to the study, there is no credible basis for Branfireun’s claim.

Twaroski offers more details on how Branfireun’s arguments ignore the monitoring requirements included in PolyMet’s other environmental permits. See Exhibit I, Twaroski Decl. ¶¶ 36-44. Twaroski also explains why the NorthMet permits cumulatively are more

- E. *Branfireun’s opinion is that the Project will “create a substantial risk of ecologically significant increases in water column and fish methylmercury concentrations in downstream waters, include the St. Louis River due to changes in wetland biochemical processes (primarily mercury methylation) driven by hydrological impacts of pit dewatering, subsequent changes to wetland biogeochemistry as a function of these changes, and aqueous sulfate discharges to headwaters.” (2019 Branfireun, § 3 at 14)*

While this opinion relates to downstream water quality, Branfireun neither defined what he meant by “significant increases” nor identified where any such increases would occur. He provided no calculations to dispute the conclusions in the Cross-Media Analysis. Instead, his criticisms were primarily based on a lack of understanding that the Cross-Media Analysis accounted for cumulative effects on downstream water quality, as discussed above. Branfireun’s comments concerning the effects of sulfate discharges to the Embarrass headwaters wetlands were grounded largely in his unsupported view that the Project’s environmental controls will not work as designed and will cause substantial seepage of sulfate into the environment. He also ignored the fact that the Project will reduce sulfate and mercury loading in the St. Louis River by more than 1.28 million kilograms per year and 5.2 grams per year, respectively—most of which is due to the collection and containment of Project impacted waters prior to discharge of treated water.

As to the impacts of pit dewatering, Branfireun criticized the analytical approach used by PolyMet and MPCA, but failed to provide his own model or projections as to the amount of potential drawdown that will occur. MPCA has determined, based on its extensive experience and analysis with open pit mines in northern Minnesota, that the extent of drawdown will be insignificant. It has also backed up its determinations with extensive monitoring requirements to verify the predicted outcomes.²⁰

than sufficient to detect potential impacts from any mercury and methylmercury releases before those impacts occur, allowing adaptive management measures to be implemented in a timely fashion before irreparable damage occurs.

²⁰ Twaroski provides more discussion in his declaration (Exhibit 1 ¶¶ 32-34) about why wetland drawdown associated with the Project will be minimal. Paragraph 45 explains why Branfireun’s 2019 claims, like his 2014 and 2016 claims, are unfounded in light of the robust monitoring program required by PolyMet’s permits. Branfireun’s comments do not change the fact that PolyMet’s project will result in reductions in sulfate and mercury loads to the environment, and that there will be no measurable change in concentrations of mercury and methylmercury in the Embarrass River, Partridge River, or the St. Louis River, including both upstream and downstream of the FDL Reservation.