STATE OF MINNESOTA
DEPARTMENT OF NATURAL RESOURCES

RECORD OF DECISION

In the Matter of the Final Environmental Impact Statement for the PolyMet Mining, Inc., NorthMet Mining Project and Land Exchange, St. Louis County, Minnesota, Pursuant to Minnesota Rules, Parts 4410.0200 to 4410.6500	))))))	**FINDINGS OF FACT, CONCLUSIONS AND ORDER**

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Based upon, and after having considered the entire record of the proceeding, including written reports, written and oral data, information, and statements, the Department of Natural Resources (DNR) makes the following:

FINDINGS OF FACT

PROPOSED MINING PROJECT SUMMARY

1. PolyMet Mining, Inc. ("Proposer") proposes to develop the NorthMet copper-nickel-platinum group elements ("PGE") mine and associated processing facilities ("the NorthMet Mining Project," "proposed project," or "proposed action"). Construction would last for approximately 18 months and would include land clearing, tailings basin improvements, building renovation and construction, stockpile preparation, and utility upgrades. Mining would involve open-pit surface methods for approximately 20 years, resulting in production of approximately 32,000 tons per day ("tpd") of ore and 41,000 tpd of waste rock. The mine site is proposed at a previously undisturbed site. The processing site is proposed at a previously developed taconite processing site. Ore would be transported by an upgraded existing railway to a refurbished taconite facility for processing. Processing wastes, including tailings and hydrometallurgical residues, would be deposited in an upgraded existing tailings basin and new hydrometallurgical residue facility respectively. Final land reclamation, closure, and post-closure maintenance would occur after mining and would include infrastructure removal, site grading, revegetation, long-term water treatment, maintenance, and monitoring. Financial assurance must be provided as part of a Permit to Mine.

2. Prior to commencing construction of the proposed project the Proposer would be required to obtain both state and federal permits.

REGULATORY FRAMEWORK

A. General Requirements for the EIS

3. Prior to making permitting decisions regarding this project or commencing construction of this project, both the State and the Proposer must comply with the Minnesota Environmental Policy Act ("MEPA"), which mandates preparation of an Environmental Impact Statement ("EIS") when "there

is potential for significant environmental effects resulting from any major governmental action." *See* Minn. Stat. § 116D.04. The issuance of federal or state permits constitutes a "major government action" within the meaning of Minn. Stat. § 116D.04. An EIS is prepared if the project meets or exceeds the thresholds of any of the EIS categories listed in Minnesota Rules part 4410.4400. *See* Minn. R. 4410.2000, subp. 2.

4. For any project listed in Minnesota Rules parts 4410.4300 or 4410.4400, the governmental unit specified in those rules must be the responsible governmental unit ("RGU") unless the project is to be carried out by a state agency, in which case that state agency is the RGU. *See* Minn. R. 4410.0500, subp. 1.

5. Multiple projects and multiple stages of a single project that are connected actions or phased actions must be considered in total when determining the need for an EIS and in preparing the EIS. *See* Minn. R. 4410.2000, subp. 4. Two projects are "connected actions" if the RGU determines they are related in any of the following ways: one project would directly induce the other; one project is a prerequisite for the other and the prerequisite project is not justified by itself; or neither project is justified by itself. *See* Minn. R. 4410.0200, subp. 9c.

6. RGUs employ an interdisciplinary approach when preparing an EIS. This interdisciplinary approach is to ensure the integrated use of the natural, environmental, and social sciences. The RGU may request that another governmental unit help with the completion of the EIS. Governmental units must provide any unprivileged data or information, to which they have reasonable access, concerning the subjects to be discussed and assist in the preparation of environmental documents on any project for which they have special expertise or access to information. *See* Minn. R. 4410.2200.

7. The EIS prepared by the RGU must include, among other things, a comparison of the proposed project's potentially significant impacts relative to mitigation that could reasonably eliminate or minimize those adverse effects; an evaluation of the potentially significant adverse or beneficial environmental, economic, employment, and sociological impacts for the proposed project and each type of reasonable alternatives to the project; and identification of mitigation measures that could reasonably eliminate or minimize those adverse impacts. The discussion of impacts must include direct, indirect, and cumulative effects. The data and analyses must be commensurate with the importance of the impact and the relevance of information to making a choice among the alternatives, or the need for mitigation. *See* Minn. R. 4410.2300, items (G), (H), (I). The EIS must also respond to timely substantive comments on the draft EIS. *See* Minn. R. 4410.2700.

8. Mitigation means avoiding impacts altogether by not undertaking a certain project or parts of a project; minimizing impacts by limiting the degree or magnitude of a project; rectifying impacts by repairing, rehabilitating, or restoring the affected environment; reducing or eliminating impacts over time by preservation and maintenance operations during the life of the project; compensating for impacts by replacing or providing substitute resources or environments, or reducing or avoiding impacts by implementation of pollution prevention measures. *See* Minn. R. 4410.0200, subp. 51.

9. Cumulative impact means the impact on the environment that results from incremental effects of the project in addition to other past, present, and reasonably foreseeable future projects regardless of what person undertakes the other projects. Cumulative impacts can result from individually minor but collectively significant projects taking place over a period of time. *See* Minn. R. 4410.0200, subp. 11.

10. Alternatives to be addressed in an EIS include: alternative sites; alternative technologies; modified designs or layouts; modified scale or magnitude; and alternatives incorporating reasonable mitigation measures identified through comments received during the comment periods for EIS scoping or for the draft EIS. The EIS must provide a concise explanation of why an alternative of a particular type is not included in the EIS. *See* Minn. R. 4410.2300, subp. G.

11. Alternatives included in the scope of the EIS that were considered but eliminated based on information developed through the EIS analysis must be discussed briefly and the reasons for their elimination must be stated. The "no action" alternative must also be addressed. An alternative may be excluded from analysis in the EIS if (i) the alternative does not meet the underlying need for or purpose of the project, (ii) the alternative will likely not have any significant environmental benefit compared to the project as proposed, or (iii) another alternative, of any type, that will be analyzed in the EIS would likely have similar environmental benefits but substantially less adverse economic, employment, or sociological impacts. *See* Minn. R. 4410.2300, item G. S*ee* Minn. R. 4410.2100.

12. If information about potentially significant environmental effects that is essential to a reasoned choice among alternatives is incomplete or unavailable due to excessive cost, extended time to obtain, or the means to obtain it are beyond the state of the art, then the RGU must explain why the information is lacking, explain its relevance, briefly summarize existing credible scientific evidence, and provide the RGU's evaluation based upon theoretical approaches or generally accepted research methods. *See* Minn. R. 4410.2500.

13. Minnesota Rules also prescribe the standard format for an EIS. The EIS must include a: cover sheet; summary; table of contents; list of preparers; project description; governmental approvals; alternatives; environmental, economic, employment, and sociological impacts; mitigation measures; and appendix. If an RGU prepares an appendix to an EIS, the appendix should include, when applicable: material prepared in connection with the EIS, as distinct from material which is not prepared and which is incorporated by reference; material which substantiates any analysis fundamental to the EIS; and permit information that was developed and gathered concurrently with the preparation of the EIS. *See* Minn. R. 4410.2300.

14. An EIS must also identify and briefly discuss any major differences of opinion concerning significant impacts of the proposed project on the environment. *See* Minn. R. 4410.2300, subp. H.

15. The RGU must incorporate material into an EIS by reference to reduce the bulk of the EIS document without impeding the governmental and public review of the project. Incorporated material must be cited and briefly described in the EIS, and also be reasonably available for inspection. *See* Minn. R. 4410.2400.

16. When a project requires both federal and state environmental review the RGU shall cooperate with the federal agencies "to the fullest extent possible to reduce duplication" between environmental review required by MEPA and environmental review required by the National Environmental Policy Act ("NEPA"). Minn. R. 4410.3900, subp. 1.

B. Scoping Requirements

17. The RGU conducts a scoping process prior to preparing an EIS in order to reduce the scope and bulk of the EIS. During the scoping process, the RGU identifies those potentially significant issues relevant to the proposed project, defines the form, level of detail, content, alternatives, time table for the EIS preparation, and preparers of the EIS. The RGU also determines the permits for which information will be developed concurrently with the EIS. *See* Minn. R. 4410.2100, subp. 1.

18. For all projects requiring an EIS the RGU must prepare an Environmental Assessment Worksheet ("EAW"). The EAW is the basis for the scoping process and is used only as a scoping document. *See* Minn. R. 4410.2100, subp. 2.

19. In conjunction with the EAW the RGU prepares and circulates a draft scoping decision document that addresses the contents for a scoping decision specified by Minnesota Rules, part 4410.2100, subpart 6, to the extent that information is already available. The purpose of the draft scoping decision document is to facilitate the delineation of issues and analyses to be contained in the EIS. *See* Minn. R. 4410.2100, subp. 2.

20. The scoping decision contains: the issues to be addressed in the EIS; time limits for preparation, if they are shorter than those allowed by Minnesota Rules parts 4410.0200 to 4410.6500; identification of permits for which information will be gathered concurrently with EIS preparation; identification of the permits for which a record of decision will be required; alternatives that will be addressed in the EIS; identification of potential impact areas resulting from the project itself and from related actions which must be addressed in the EIS; and identification of necessary studies requiring compilation of existing information or the development of new data that can be generated within a reasonable amount of time and at a reasonable cost. *See* Minn. R. 4410.2100, subp. 6.

21. The information in the draft scoping decision must be considered preliminary and subject to revision based on the entire record of the scoping process. *See* Minn. R. 4410.2100, subp. 2.

22. The 30-day scoping period begins when the notice of availability of the EAW and draft scoping decision is published in accord with Minnesota Rules, part 4410.1500, items A and B. The notice and press release announcing the availability of the EAW must include the time, place, and date of the scoping meetings. *See* Minn. R. 4410.2100, subp. 3A.

23. The RGU must hold at least one scoping meeting during the scoping period. The meeting must not be held less than 15 days after publication of the notice of availability of the EAW. *See* Minn. R 4410.2100, subp. 3B.

24. Written comments suggesting issues for scoping or commenting on the EAW must be filed with the RGU during the scoping period. Interested persons may attend the scoping meeting to exercise their right to comment. Governmental units and other persons who are participating in the scoping process are required to participate within the time limits and in the manner prescribed in Minnesota Rules, parts 4410.0200 to 4410.6500. *See* Minn. R. 4410.2100, subp. 5.

25. The Environmental Review Program rules do not require the RGU to respond to comments received on the scoping EAW and draft scoping decision document, but the rules do require the RGU to consider the comments received in developing the final scoping decision. *See* Minn. R. 4410.2100, subp. 5.

26. The final scoping decision must be issued within 15 days after the close of the 30-day scoping period. *See* Minn. R. 4410.2100, subp. 3C.

27. After the scoping decision is made, the RGU may not amend the decision without the agreement of the proposer unless substantial changes are made in the proposed project that affect the potential significant environmental effects of the project or substantial new information arises relating to the proposed project that significantly affects the potential environmental effects of the proposed project or the availability of prudent and feasible alternatives to the project. If the scoping decision is amended after publication of the notice of the EIS preparation, a separate notice and summary of the amendment to the scoping decision must be published in the Environmental Quality Board (EQB) *Monitor* within 30 days of the amendment. The notice may be incorporated in the notice of availability of the draft or final EIS. *See* Minn. R. 4410.2100, subp. 8.

28. An EIS preparation notice must be published within 45 days after the scoping decision is issued. The notice shall be published in the EQB *Monitor*, and a press release must be issued to at least one newspaper of general circulation in each county where the project will occur. *See* Minn. R. 4410.2100, subp. 9. The press release must contain a summary of the scoping decision. *See* Minn. R. 4410.2100, subp. 9.

29. To facilitate the decision-making process, an RGU may require the Proposer to provide research or studies for inclusion into the EIS. RGUs are responsible for verifying the accuracy of environmental documents. *See* Minn R. 4410.2100, subp. 6G. *See* Minn. R. 4410.0400. subp. 2.

C. Draft EIS

30. A Draft EIS must be prepared consistent with Minn. R. parts 4410.0200 to 4410.6500 and in accord with the final scoping decision.

31. When the draft EIS is completed, the RGU must make the draft EIS available for public review and comment and must hold an informational meeting in the county where the project is proposed. *See* Minn. R. 4410.2600, subp. 2. The entire draft EIS with appendices must be provided to: any governmental unit which has authority to permit or approve the proposed project, to the extent known; the proposer of the project; the EQB and EQB staff; the Environmental Conservation Library; the Legislative Reference Library; the Regional Development Commission and Regional Development

Library; a public library or public place where the draft will be available for public review in each county where the project will take place, to the extent known; and, to the extent possible, to any person requesting the entire EIS. *See* Minn. R. 4410.2600, subp 3.

32. The summary of the draft EIS must be provided to all members of the EAW distribution list that do not receive the entire draft EIS, any person that submitted substantive comments on the EAW that does not receive the entire draft EIS, and any person requesting the summary. *See* Minn. R. 4410.2600, subp. 4.

33. The copy provided to the EQB staff shall serve as notification to publish notice of availability of the draft EIS in the EQB *Monitor*. *See* Minn. R. 4410.2600, subp. 5.

34. The RGU must supply a press release to at least one newspaper of general circulation within the area where the project is proposed. *See* Minn. R. 4410.2600, subp. 6.

35. The notice of availability for the EQB *Monitor* and the press release must contain notice of the date, time, and place of the information meeting, notice of the location of the copy of the draft EIS available for public review, and notice of the date of termination of the comment period. *See* Minn. R. 4410.2600, subp. 7.

36. A public information meeting must be held not less than 15 days after publication of the notice of availability in the EQB *Monitor*. A typewritten or audio-recorded transcript of the meeting must be made. *See* Minn. R. 4410.2600, supb 8.

37. The record must remain open for public comment not less than ten days after the last date of the informational meeting. Written comments on the draft EIS may be submitted any time during the comment period. *See* Minn. R. 4410.2600, subp. 9.

38. The RGU must respond to the timely substantive comments received on the draft EIS and prepare the final EIS. *See* Minn. R. 4410.2600, subp. 10.

D. Final EIS

39. The final EIS responds to the timely substantive comments on the draft and supplemental draft EIS consistent with the scoping decision. The RGU discusses, at appropriate points in the final EIS, any responsible opposing views relating to the scoped issues that were not adequately discussed in the draft EIS. The RGU must also indicate its response to the opposing views in the final EIS. *See* Minn. R. 4410.2700, subp. 1.

40. If only minor changes to the draft EIS are suggested in the comments on the draft, the written comments and the responses may be attached to the draft or bound as a separate volume and circulated as the final EIS. If other than minor changes are required, the draft text must be rewritten so that necessary changes in the text are incorporated in the appropriate places. *See* Minn. R. 4410.2700, subp. 2.

41. The RGU must provide copies of the final EIS to all persons receiving copies of the entire draft EIS. Copies are provided to any person who submitted substantive comments on the draft EIS, and to the extent possible, to any person requesting the final EIS. *See* Minn. R. 4410.2700, subp. 3.

42. The RGU must provide EQB staff with a copy of the final EIS, and this constitutes notice to the EQB to publish notice of availability of the final EIS in the EQB *Monitor*. *See* Minn. R. 4410.2700, subp. 4.

43. The RGU must issue a press release to at least one newspaper of general circulation within the area where the project is proposed. *See* Minn. R. 4410.2700, subp. 5.

44. The notice of availability in the EQB *Monitor* and the press release contains notice of the location of the copy of the final EIS available for public review and notice of the opportunity for public comment on the adequacy of the final EIS. *See* Minn. R. 4410.2700, subp. 6.

45. Interested persons may submit written comments on the adequacy of the final EIS to the RGU or the EQB, if applicable, for a period of not less than ten days following the publication in the EQB *Monitor* of the notice of availability of the final EIS. The notice of availability of the final EIS must indicate when the comment period expires. *See* Minn. R. 4410.2800, subp. 2.

46. Unlike with comments on the draft EIS, Minnesota Rule 4410.2800 imposes no requirement that a RGU respond to comments on the Final EIS. Compare Minn. R. 4410.2700 with Minn. R. 4410.2800.

47. The determination of adequacy of the final EIS must be made within 280 days after the preparation notice was published in the EQB *Monitor* unless the time is extended by consent of the Proposer and the RGU or by the governor for good cause. *See* Minn. R. 4410.2800, subp. 3.

48. The determination of adequacy of the final EIS must be made at least ten days after publication in the EQB *Monitor* of the notice of availability of the final EIS. *See* Minn. R. 4410.2800, subp. 3.

E. Adequacy Decision

49. In making an adequecy decision, the RGU applies the criteria found at Minnesota Rules, part 4410.2800, subp. 4 which states:

> The final EIS shall be determined adequate if it:
>
> A. addresses the potentially significant issues and alternatives raised in scoping so that all significant issues for which information can be reasonably obtained have been analyzed in conformance with part 4410.2300, items G and H;
> B. provides responses to the substantive comments received during the draft EIS [and supplemental draft EIS] review concerning issues raised in scoping; and
> C. was prepared in compliance with the procedures of the act and parts 4410.0200 to 4410.6500.

50. If the RGU determines that the EIS is inadequate, the RGU has 60 days in which to prepare an adequate EIS. The revised EIS must be circulated in accord with Minn. R. 4410.2700, supb 3. *See* Minn. R. 2800, subp. 5.

51. The RGU must notify all persons receiving copies of the final EIS pursuant to Minn. R. 4410.2700, subp. 3, of its adequacy decision within five days of the adequacy decision. Public notice of the decision must be published in the EQB *Monitor*. *See* Minn. R. 4410.2800, subp. 6.

NORTHMET EIS PROCESS

52. An EIS for the Project is required because the Project meets the threshold articulated in Minnesota Rules, part 4410.4400, subps. 8b and 8c. DNR, as the RGU, is responsible for assessing the adequacy of the EIS. *See* Minn. R. 4410.2800, subp. 4.

A. Joint Agency Preparation/Lead and Cooperating Agencies

53. The United States Army Corps of Engineers ("USACE"), United States Forest Services ("USFS"), the Proposer, and DNR entered into a memorandum of understanding (MOU) for the purpose of preparing a joint state/federal EIS on February 23, 2005. The joint EIS allowed evaluation of the NorthMet Mining Project in accordance with the National Environmental Policy Act (NEPA; 42 U.S.C. §-§ 4321-4347) and Minnesota Environmental Policy Act (MEPA; Minnesota Statutes Chapter 116D). Minn. R. 4410.3900.

54. The MOU identified the USACE and DNR as lead agencies for joint preparation of the scope of work for the EIS and preparation of the EIS itself. The USFS was identified as a Cooperating Agency. *See* 40 CFR § 1501.6. Shortly thereafter, on March 15, 2005, the MOU was amended to reflect changes to the conflict resolution procedures at the request of the USFS.

B. 2005 Scoping Process

55. DNR and USACE (the "Co-lead Agencies"), in consultation with the USFS, Minnesota Pollution Control Agency (MPCA) and Minnesota Department of Health (MDH), conducted public scoping for the EIS from June 6, 2005 to October 25, 2006. The Co-lead Agencies determined the breadth of environmental alternatives and impacts to be included in the EIS. The process culminated in a Final Scoping Decision Document on October 25, 2005.

56. The Co-lead Agencies prepared a Scoping EAW and draft Scoping Decision Document ("Draft Scope"). *See* Minn. R. 4410.2100. Between November 22, 2004 and February 2, 2005, DNR accepted the Proposer's completed data portions of the EAW for use in EIS scoping, (*see* Minn. R. 4410.1400), and determined the Proposer's Scoping EAW data submittal to be complete for scoping purposes. *See* Minn. R. 4410.2100. On May 30, 2005, the Co-lead Agencies finalized a Scoping EAW and Draft Scope for the Project. *See* Minn. R. 4410.2100, subps. 1 and 2.

57. Scoping EAW Item 8 listed known permits and public approvals required before the Project could proceed. The regulatory and public authorities cited included: DNR; MPCA; USACE; United States Fish and Wildlife Service ("USFWS"); MDH; City of Babbitt; and the State of Minnesota.

58. In compliance with MInn. R. 4410.2100, the Draft Scope included: an introduction and purpose; project alternatives; EIS issues; identification of phased or connected actions (none); EIS schedule; and special studies or research requiring (i) compilation of existing information or (ii) the development of new data that could be generated within a reasonable amount of time and at a reasonable cost.

59. Alternatives proposed in the Draft Scope for discussion included the proposed project alternative; no action alternative; site alternatives; technology, design and layout alternatives; and alternatives incorporating reasonable mitigation measures identified through EIS scoping and Draft EIS comment periods. *See* Minn. R. 4410.2100, subp. 6. The Draft Scope did not propose to evaluate alternative scale or magnitude alternative(s) to the Project because although there may be environmental benefits from smaller amounts of mine waste associated with a smaller scale project, the cost of operating a smaller mine and ore processing facility for the diffuse ore body would adversely impact the feasibility of the project.

60. Potentially significant EIS issues proposed for detailed treatment included: physical impacts on water resources; water appropriations; surface water runoff; wastewater; solid waste; cumulative effects; and reclamation.

61. The Draft Scope proposed that the EIS discuss some resource issues even though significant impacts were not expected to those resources These issues included: cover types; fish and wildlife resources; threatened and endangered species; erosion and sedimentation; air emissions; odor and noise; archaeology; compatibility with plans and land use regulations; infrastructure; and asbestiform fibers.

62. The Draft Scope proposed a series of issues for no further treatment in the EIS (beyond the assessment in the Scoping EAW). These issues included: land use; water-related land use management district; water surface use; geologic hazards and soil conditions; traffic; vehicle related air emissions; and visibility.

63. The Draft Scope required evaluation of cumulative effects using guidance from the Council on Environmental Quality ("CEQ"). (Handbook for considering cumulative effects under NEPA (CEQ, 1997).

1. 2005 Scoping Process—Public Review and Comment

64. The Notice of Availability of the Scoping EAW and Draft Scope was published in the EQB *Monitor* (Vol. 29, No. 14) on June 6, 2005, beginning a 30-day scoping period. The notice included the time, place, and date of the scoping meeting. *See* Minn. R. 4410.2100, subp. 3A.

65. DNR issued a statewide press release that went to numerous news outlets, including newspapers of general circulation in the vicinity of the project. The press release included the name and location of the project, a brief description of the project, the location at which copies of the Scoping EAW and

Draft Scope were available for review, the date and location of the public meeting, the date the comment period ended, and the procedures for commenting. *See* Minn. R. 4410.1500, item B.

66. DNR provided copies of the Scoping EAW and Draft Scope to all parties designated on the EQB EAW distribution list. The Scoping EAW and Draft Scope were also made available to the public via posting on the DNR's website. *See* Minn. R. 4410.2100, subp. 2. *See* Minn. R. 4410.1500, item C.

67. DNR provided public review copies of the Scoping EAW and Draft Scope to three public libraries, the regional development library for the region of the project site, the DNR library in St. Paul, Minnesota, and the DNR Northeast Regional Office in Grand Rapids, Minnesota.

68. The Co-lead Agencies held a public scoping meeting on June 29, 2005 in Hoyt Lakes, Minnesota. Approximately 70 people attended the meeting. DNR presented information, provided a comment form for submitting written comments, and a stenographer recorded oral comments on the proposed EIS scope. *See* Minn. R. 4410.2100, subp. 3B.

69. The Co-lead Agencies conducted the public scoping meeting not less than 15 days after publication of the notice of availability of the EAW in the EQB *Monitor*. *See* Minn. R. 4410.2100, subp. 3B.

70. A Notice of Intent to prepare a joint state/federal EIS was published in the *Federal Register* (Vol. 70, No. 126) July 1, 2005. The notice specified that the USACE would be the lead federal agency and that the DNR would be the lead state agency.

71. The Co-lead Agencies closed the 30-day scoping comment period on July 6, 2005.

72. The Co-lead Agencies received 29 comment letters during the 30-day review and comment period and transcribed oral comments from two individuals during the public scoping meeting on the Scoping EAW and Draft Scope.

73. The Co-lead Agencies considered the timely comments on the Scoping EAW and Draft Scope.

2. 2005 Scoping Process—Final Scoping Decision Document

74. The Co-lead Agencies considered all comments received during the EIS scoping period, made revisions to the Draft Scope as warranted, and issued the Final Scoping Decision Document ("Final Scope") on October 25, 2005. The 15-day requirement to issue the Final Scope after the close of the scoping period was extended for 90 calendar days by consent of the Proposer and RGU for good cause. *See* Minn. R. 4410.2100, subp. 3C.

75. The Co-lead Agencies responded to comments received on the Scoping EAW and Draft Scope in the document titled "*Response to Public Scoping Comments; PolyMet Mining, Inc., NorthMet Project; October 25, 2005*." The responses identified substantive comment-based revisions made by the Co-Lead Agencies to the Draft Scope for the Final Scope.

76. DNR provided copies of the Final Scope to all parties designated on the EAW distribution list, to all parties that submitted comments on the draft scoping documents, and to all parties requesting copies. The Final Scope was also made available to the public by posting the Final Scope on DNR's website.

3. 2005 Scoping Process—Content of the Final Scope

77. The Final Scope included: (1) issues to be addressed in the EIS; (2) time limits for preparation of the EIS, if they would be shorter than those allowed by parts 4410.0200 to 4410.6500; (3) a list of the permits for which information would be gathered concurrently with EIS preparation; (4) permits for which a record of decision would be required; (5) alternatives that would be addressed in the EIS; (6) potential impact areas resulting from the project itself and from related actions to be addressed in the EIS; and (7) identification of studies to be completed for the EIS, including those requiring compilation of existing information or development of new data. *See* Minn. R. 4410.2100, subp. 6.

78. In response to comments on the Draft Scope, the Co-lead Agencies made the following substantive revisions to the Final Scope:

    1.0 Introduction and Purpose. The Co-lead Agencies modified the project purpose and need statement in the Final Scope. Text identified by commenters as problematic in the consideration of alternatives was removed.

    2.0 Project Alternatives. The Final Scope identified additional alternative technologies and modified designs that would be considered during the environmental review process. One such alternative was underground mining, which would use underground mining technology, including a pressure leaching method for refining copper and nickel, to refine the NorthMet ore. Another alternative identified in the Final Scope was the use of two mine pits. One pit would be mined out before beginning the second pit, and waste rock from the second pit would be placed in the first pit, thus reducing waste rock stockpiles. The Final Scope also identified additional mitigation measures, including building a subsurface perimeter wall around the waste rock and tailings ponds, as well as monitoring wells.

    3.0 EIS Issues. Potentially significant impacts identified in Finding of Fact paragraph 60 proposed to remain for the Final Scope were: physical impacts on water resources; water appropriations; surface water runoff; wastewater; solid waste; cumulative effects; and reclamation. New issues proposed in the final scoping decision for detailed analysis in the EIS included: fish and wildlife resources; threatened and endangered species; and erosion and sedimentation.

    3.0 EIS Issues. Issues identified in Finding of Fact paragraph 61 for which potentially significant impacts were not expected but that would be augmented with information beyond the Scoping EAW proposed to remain for the Final Scope were: cover types; air emissions; odor and noise; archaeology; visibility; compatibility with plans and land use regulations; infrastructure; and other – asbestiform fibers.

New issues proposed for this EIS treatment in the Final Scope included: vehicle related air issues; visibility; and impacts on the 1854 Ceded Territory.

3.0 EIS Issues. The Final Scope also identified issues that were discussed in the Scoping EAW but would not receive additional consideration. Those topics included: land use; water-related land use management district; water surface use; geologic hazards and soil conditions; and traffic.

5.0 EIS Schedule (Tentative). The tentative EIS schedule was modified for the Final Scope.

6.0 Special Studies or Research. The Co-lead Agencies required the Proposer to provide special research or studies, subject to Co-lead Agencies review and confirmation, on the following topics: process design – tailings basin water balance; hydrology – mine water model and balance; mine wastewater management systems; mine surface water runoff systems; mine diking/trenching effectiveness; wastewater treatment options; reactive waste rock stockpile chemical modification; mine pit water quality model; mine waste management; wastewater modeling – waste rock and lean ore; water treatability – waste rock and lean ore; wastewater modeling – tailings; water treatability – tailings; and closure.

4. 2005 Scoping Process—Alternatives Identified in the Final Scope

79. In accord with Minnesota Rules 4410.2300, item G, the Co-lead Agencies considered the following alternatives for inclusion in the EIS:

Final Scope Section 2.1 – Proposed Alternative. The EIS would address the proposed project and its associated potential environmental and socioeconomic effects.

Final Scope Section 2.2 – No Action Alternative. The EIS would address the expected condition of the environment, including socioeconomic effects, if the proposed project were not developed.

Final Scope Section 2.3 – Site Alternatives. Three site alternatives related to waste rock and tailings disposal were to be addressed in the EIS:

- *In-pit Reactive Waste Rock Disposal*. The Final Scope identified that the EIS should address the sub-aqueous placement of waste rock in an existing taconite mine pit, if feasible. In order to evaluate subaqueous placement, however, land and mineral ownership issues which could affect the alternative's feasibility would need to be addressed. *See* Final Scope Section 2.3.1.

- *Off-site Non-reactive Waste Rock Disposal*. The Final Scope identified that the EIS should address reducing the total amount of land disturbance by stockpiling in existing areas already disturbed by mining activity, if feasible. In order to evaluate this alternative, the effect of land and mineral ownership issues on the feasibility of the alternative would need to be investigated. *See* Final Scope Section 2.3.1.

- *In-pit Tailings Disposal*. The Final Scope identified that the EIS should address sub-aqueous placement of tailings in existing taconite mine pits, if feasible. The document identified land and mineral ownership issues that could affect the feasibility of the alternative, and that needed further investigation. *See* Final Scope Section 2.3.2.

Final Scope Section 2.4 – Technology Alternatives. The Final Scope identified that the EIS should address the feasibility and environmental impacts associated with using underground mining techniques to mine the NorthMet ore deposit. The document identified the need for further investigation into whether this alternative could satisfy the purpose and need of the proposed project, and whether this alternative would result in significant environmental benefits. *See* Final Scope Section 2.4.1.

Final Scope Section 2.5 – Modified Designs or Layouts. The Final Scope identified a series of design and layout alternatives:

- *Project Design Components*. The Final Scope identified that the EIS should address various design components through a series of technical design evaluation reports. Aspects of the project evaluated under the alternative included: reactive residue facility and initial tailings facility; tailings basin geotechnical; wastewater treatment; air emission control; wetland mitigation; reactive waste segregation; and tailings basin modification. *See* Final Scope Section 2.5.1.

- *Two Mine Pits*. The Final Scope identified that the EIS should address the feasibility and environmental impacts of mining the NorthMet deposit as two mine pits, with one pit being completely mined out before beginning the second pit. The evaluation would consider the feasibility of mining the two pits in a phased manner and whether mining one pit first would impede access to the second pit. The evaluation would also examine the feasibility of backfilling with both reactive and non-reactive rock. *See* Final Scope Section 2.5.2.

- *Chemical Modification of Reactive Waste Rock Stockpiles*. The Final Scope identified chemical modification of reactive waste rock stockpiles as requiring further consideration in the EIS. The Final Scope prescribed that the EIS should evaluate the feasibility of geochemical modification by incorporation of material into the waste rock stockpiles to reduce reactivity or treat reactive water within the stockpile; and data gaps, including impacts of these data gaps on the evaluation of this alternative. *See* Final Scope Section 2.5.3.

- *Co-disposal of Reactive Waste Rock and Tailings on a Lined Tailings Basin*. The Final Scope identified that the EIS should address the feasibility of disposing of waste rock with tailings in a lined basin. This alternative would depend on the feasibility of employing a lined tailings basin. *See* Final Scope Section 2.5.3.

- *Wastewater*. The Final Scope identified that the EIS should address the suitability and benefits of alternative designs and layouts for wastewater treatment. *See* Final Scope Section 2.5.4.

5. 2005 Scoping Process—Alternatives Identified and Rejected in the Final Scope

80. After consideration, the Final Scope concluded that the EIS would not evaluate the following alternatives in accord with Minnesota Rules, part 4410.2300, item G:

Final Scope Section 2.3 – Site Alternatives.

- *Alternative Mine Pit Sites*. The purpose of the project is to extract the minerals located at the NorthMet Mining Site. Therefore, the Final Scope concluded that an alternative mine site would not meet the purpose and need of the project.

- *Alternative Processing Plant Sites*. The Final Scope identified that the EIS would not address alternate processing plant sites. The proposed project would locate the processing plant in a previously disturbed area. The alternative processing plant would be located on a greenfield site. The Final Scope concluded that locating the plant on a greenfield site would increase the environmental impacts of the project.

Final Scope Section 2.4 – Technology Alternatives.

- *Alternative Hydrometallurgical Technologies*. The Final Scope identified that the EIS would not address alternative hydrometallurgical technologies. The alternative hydrometallurgical technologies such as cyanide leach cause detrimental environmental effects not caused by the proposed project's technology and therefore would not provide significant environmental benefit over the proposed project's technology

Final Scope Section 2.5 – Modified Designs or Layouts.

- *Alternative Ore Transportation Designs or Layouts*. The Final Scope identified that the EIS would not address alternative designs and layouts for ore transportation from the mine to the processing plant. The proposed project includes using existing railroads and construction of a railroad spur at the mine site. This proposed project would also add approximately one mile of new railroad to connect the railroad that serves the mine site to the railroad that serves the ore processing plant. Use of this existing railroad would avoid further disturbance for the transportation corridor. Alternative designs and layouts would not likely provide significant environmental benefit over the proposed project.

- *Alternative Ore Processing Plant Designs or Layouts*. The Final Scope identified that the EIS would not address alternative designs or layouts for the ore processing plant because they would not likely provide significant environmental benefit over use of the existing facility, which would be refurbished and modified. Use of existing facilities would avoid adverse environmental effects associated with new construction of an ore processing facility.

Final Scope Section 2.6 – Scale or Magnitude Alternatives.

- *Alternative Project Scale or Magnitude*. The EIS would not address an alternative scale or magnitude for the project. Although a smaller-scale project may result in less mine waste, independent studies indicated that a small-scale project would not be economically feasible. As part of project development, the proposer evaluated various mill feed rates to estimate the economic feasibility of the project. The 32,000 tons per day (tpd) scale currently proposed was ultimately selected, however an 18,000 tpd scale was evaluated as part of the optimization process. This analysis determined that the return on investment for an 18,000 tpd operation rendered the project uneconomic. While a project greater than 18,000 tpd but smaller than 32,000 tpd may be economically feasible, such a project would not produce significant environmental benefits. Therefore, a smaller scale or magnitude that is sufficient to produce significant environmental benefits would not meet the purpose of the project.

6. 2005 Scoping Process—Mitigation Measures

81. After consideration, the Final Scope concluded that the EIS would evaluate the following mitigation measures.

    Final Scope Section 2.7 – Incorporation of Mitigation Measures Identified Through Public Comments.

    Several mitigation measures were identified through public and agency scoping comments. Though some were excluded (*see* Minn. R. 4410.2300, subp. G), the Final Scope identified that the EIS would consider the following mitigation measures.

    - *Monitoring*. The Final Scope concluded that the EIS should address the results of various monitoring programs associated with waste rock stockpiles and the tailings basin. *See* Final Scope Section 2.7.1.

    - *Strategy to Mitigate Impacts for Reactive Tailings*. The Final Scope concluded that the EIS should address the possibility that the tailings would be reactive, which would require implementation of lined tailings storage facility. The potential that long-term tests might not provide definitive answers led the Proposer to develop a strategy for mitigation that included lining a portion of the tailings basin for use in the first five years of operation, continuing waste characterization during this period, and collection of field data. If the tailings were determined to be reactive, then the remaining portions of the tailings basin to be used would need to be lined; if the tailings were determined to be non-reactive, then a liner would not be required. *See* Final Scope Section 2.7.2.

C. 2009 Draft EIS

82. At the Draft EIS phase, the project featured three separate mining pits (East, Central, and West), with the East and Central pits to be combined into one larger pit in year 13. Another project feature was waste rock stockpiles; some of the less reactive waste rock would be back-filled into the East Pit and stored subaqueously after mining was completed. Most stockpiles would be permanent surface features with liners and cover systems to prevent leaching. The Mine Site would include a wastewater treatment facility and central pumping station, and the Plant Site would include a

hydrometallurgical residue facility. There would also be a new tailings basin at the former LTV Steel Mining Company (LTVSMC) tailings basin.

1. 2009 Draft EIS—Preparation Notice

83. On April 24, 2006, the EIS Preparation Notice summarizing the Final Scope was published in the EQB *Monitor* (Vol. 30, No. 8) pursuant to the requirements of Minn. R. 4410.2100, subp.9. The DNR issued a statewide press release that went to numerous newspapers including newspapers with statewide circulation, local circulation, and at least one newspaper of general circulation in St. Louis County, Minnesota.

84. The EIS Preparation Notice identified the time to complete the EIS was longer than the 280 days identified in rule. The purpose of the extended timeframe was to account for the joint state/federal preparation of the document. The MOU identified in Finding of Facts paragraphs 53 and 54 provides the Proposer's consent to DNR exceeding the rule-designated EIS preparation timelines, which are found in Minnesota Rules parts 4410.2000 to 4410.2800.

2. 2009 Draft EIS—Interdisciplinary Preparation

85. DNR entered into a State of Minnesota Professional and Technical Services Contract with an environmental consulting firm, Environmental Resources Management (ERM) on April 4, 2006, to provide consultant services to DNR staff in preparing the EIS for the proposed Project.

86. To obtain additional assistance and expertise in the EIS preparation, the DNR entered into a State of Minnesota Interagency Agreement with the Minnesota Pollution Control Agency (MPCA) and the Minnesota Department of Health (MDH) on April 6 and April 10, 2006, respectively. Both agencies would review and assist in the development of a draft EIS and final EIS. MPCA would participate as necessary in any public information meeting.

3. 2009 Draft EIS—Cooperating Agencies and Tribal Governments

87. On August 13, 2007, the USACE invited a number of Native American tribes to become cooperating agencies for preparation of the EIS. Minnesota tribal governments invited to participate included: Bois Forte Band of Chippewa; Fond du Lac Band of Lake Superior Chippewa; Grand Portage Band of Lake Superior Chippewa; Leech Lake Band of Ojibwe; Mille Lacs Band of Ojibwe; Red Lake Nation Band of Chippewa; and White Earth Nation. The DNR deferred to the USACE for the selection of Native American tribes to invite for participation.

88. An MOU for the purpose of preparing a joint state/federal EIS among the USACE, DNR, USFS, the Bois Forte Band of Chippewa, the Fond du Lac Band of Lake Superior Chippewa, and the Proposer was created and entered into on May 19, 2008. The joint EIS allowed evaluation of the Project in accordance with the NEPA and MEPA. The prior MOU, which was initially dated February 23, 2005, and amended on March 15, 2005, expired upon execution of the revised MOU.

89. The MOU identified the USACE and DNR as lead agencies for joint preparation of the scope of work for the EIS and preparation of the EIS itself. The USFS would serve as a Cooperating Agency. Bois

Forte and Fond du Lac, federally recognized Native American Tribes that retain hunting, fishing, and gathering rights in the 1854 Treaty-ceded territory, would serve as Cooperating Agencies for the NEPA process. *See* 40 CFR § 1501.6

90. Although not a signatory to the MOU the Grand Portage Band of Lake Superior Chippewa accepted an invitation to participate as a Cooperating Agency for the EIS.

4. 2009 Draft EIS—Process

91. DNR and USACE, with the assistance of ERM, prepared a Draft EIS, which included the following components as prescribed by the EQB rules: cover sheet; summary; table of contents; list of preparers; project description; list of governmental approvals; discussion of alternatives, including a discussion of why particular alternatives were considered but eliminated; potentially significant environmental and economic impacts identified in scoping; mitigation measures; and appendices containing analysis fundamental to the EIS. The Final Scope did not require permit information to be developed and gathered concurrently with the preparation of the EIS, thus the EIS did not include this component. The Draft EIS included all of the elements prescribed by the EQB Rules. *See* Minn. R. 4410.2300.

5. 2009 Draft EIS—Alternatives Developed During Scoping Considered for the Draft EIS

92. Consistent with Minnesota Rules, part 4410.2300, item G, the Co-lead Agencies screened alternatives identified through the process of EIS scoping and/or development of the EIS against the following criteria:

    Purpose and Need. Each alternative was assessed to determine whether it would meet the purpose and need for the project.

    Technical Feasibility. Each alternative was assessed to determine whether it could be implemented using available technology based on the current level of knowledge.

    Economic Feasibility. Each alternative was assessed to determine whether it could meet economic and financial requirements to construct and operate the proposed project, including whether the alternative would be economically feasible in light of the project purpose and need.

    Availability. Each alternative was assessed to determine whether surface rights, mineral rights, technologies, and other resources required are currently available.

    Environmental or Socioeconomic Benefit. Each alternative was assessed to determine if it offered substantial environmental or socioeconomic benefits over other alternatives, including the proposed project.

93. Alternatives screened against the criteria from Finding of Fact paragraph 92 and carried forward for consideration in the Draft EIS included:

Final Scope Section 2.1 - Proposed Alternative.

Final Scope Section 2.2 - No Action Alternative.

Final Scope Section 2.5 – Modified Designs or Layouts.

- *Two Mine Pits*. This potential measure was considered pursuant to Final Scope Section 2.5.2. The first pit to be mined (East Pit) would be backfilled with the least reactive waste Category 1 and Category 2 waste rock from the later mined pit (West Pit). Because this two-pit layout (West Pit and East Pit) would result in fewer environmental impacts, the measure was integrated into the proposed project and addressed in the Draft EIS.

- *Chemical Modification of Reactive Waste Rock Stockpiles*. This potential measure was considered pursuant to Final Scope Section 2.5.3. It was carried forward for consideration in the EIS as a mitigation measure in the Mine Site Alternative.

94. After screening against the criteria set forth in Finding of Fact paragraph 92, the following alternatives from scoping were excluded from consideration in the Draft EIS:

Final Scope Section 2.3 – Site Alternatives.

- *Off-site In-pit Reactive Waste Rock Disposal*. This alternative disposal measure was considered pursuant to Final Scope Section 2.3.1. The proposed project's onsite subaqueous disposal would provide similar environmental benefits and avoid the environmental impact of transporting the waste rock to an offsite location (e.g., to LTVSMC Area 3 pit). Therefore, the Draft EIS did not address this alternative.

- *Off-site Non-reactive Waste Rock Disposal*. This alternative disposal measure was considered pursuant to Final Scope Section 2.3.1. Because it was determined that all waste rock would be reactive, this alternative was not evaluated further.

- *In-Pit Tailings Disposal*. This alternative disposal measure was considered pursuant to Final Scope Section 2.3.2. The only available location for this approach to be pursued was the LTVSMC Area 5 pits. Even if this alternative was used, a tailings basin would still be required because the Area 5 pit would not have enough capacity for all of the tailings produced. Therefore, the action did not provide significant environmental benefit over the proposed action.

Final Scope Section 2.4 – Technology Alternatives.

- *Underground Mining*. This alternative was considered pursuant to Final Scope Section 2.4.1. Mining with underground methods would reduce the overall minable tonnage of the deposit while lowering the daily production rate, effectively reducing the scale of the project. Both capital start-up costs and unit operating costs (per ton) would be greater than if the deposit were mined from the surface (as proposed). In concert, these factors would create an economic

imbalance such that the rate of return on an underground mining alternative would not be economically viable. Thus, this alternative would not meet the purpose and need of the proposed action.

Final Scope Section 2.5 – Modified Designs or Layouts.

- *Co-disposal of Reactive Waste Rock and Tailings on a Lined Tailings Basin*. This measure was considered pursuant to Final Scope Section 2.5.3. The proposed project did not include lining the tailings basin. However, even employing this approach would not eliminate the need to collect and treat stockpile drainage, and therefore this alternative would not provide significant environmental benefit compared to the project as proposed.

- *Disposal of Wastewater at Public Treatment Facilities*. This measure was considered pursuant to Final Scope Section 2.5.4. Although technically feasible, the two publicly owned treatment facilities close enough to the site (i.e., Cities of Hoyt Lakes and Babbitt) would not have sufficient capacity to handle the projected volume of water.

Other Alternatives Identified During Development of the Draft EIS.

- *West Pit Backfill of Waste Rock and/or Tailings*. After investigation of land and mineral ownership issues that could affect the feasibility of the alternative, the Draft EIS determined that additional mineral resources in the West Pit would effectively be lost (i.e. encumbered) if the pit were used for waste rock and/or tailings disposal. The alternative did not offer significant environmental benefit over the Mine Site Alternative under consideration in the Draft EIS.

6. 2009 Draft EIS—Alternatives Compared in the Draft EIS

95. The Draft EIS compared the potentially significant impacts of the proposal with those of other reasonable alternatives to the proposed project. *See* Minn. R. 4410.2300, item G.

Proposed Alternative. The proposed project was analyzed in the Draft EIS pursuant to the requirements of NEPA and MEPA. Major project components included three separate open mine pits (East, Central, and West Pits), with the East and Central combined into one large pit (East Pit) in Year 13; waste rock stockpiles, most of them permanent with liners and covers to prevent leaching, but some of the Category 1 and 2 (less reactive) waste rock would be back-filled into the East Pit and stored subaqueously after mining was completed; a wastewater treatment facility (WWTF) and central pumping station (CPS) at the Mine Site; a hydrometallurgical residue facility at the Plant Site; and a new tailings basin on the former LTVSMC tailings basin.

The alternatives to the Proposed Project addressed in the Draft EIS were:

Mine Site Alternative. The Mine Site Alternative consisted of a modified design or layout to reduce the Proposed Action's potential impacts to surface and ground water quality at the Mine Site. This alternative would have subaqueously disposed of the most reactive waste rock (Category 2, 3 and 4)

in the East Pit while the least reactive waste rock (Category 1 and overburden) would have remained as a permanent surface stockpile.

Tailings Basin Alternative. The Tailings Basin Alternative consisted of a modified design or layout to reduce the Proposed Action's potential impacts to surface and ground water quality at the Tailings Basin. The fundamental difference between this alternative and the Proposed Action was the management of seepage and geotechnical stability in the Tailings Basin. The Alternative included: groundwater pumping wells on the northern embankment of the Tailings Basin to capture seepage, with reuse of the seepage water as process make-up water and/or discharge to the Partridge River; increased rock buttress material along the toe of the northern embankment of Cell 2E to improve geotechnical stability; a partial dry cap during Closure; and demonstration testing of a permeable reactive barrier, with installation if successfully demonstrated.

No Action Alternative. The No Action Alternative was analyzed in the Draft EIS pursuant to the requirements of NEPA and MEPA. Under the No Action Alternative, the proposed Project would not be constructed and open pit mining operations would not occur. At the Mine Site, the Proposer would reclaim the surface disturbance from the exploratory and development activities and existing surface uses (e.g., logging) would continue. At the Plant Site, Cliffs-Erie LLC would complete Closure and reclamation activities required under the existing Closure Program. Additional Tailings Basin water quality impact measures may also be required.

7. 2009 Draft EIS—Impacts Addressed

96. The Draft EIS addressed the potentially significant adverse or beneficial environmental, economic, employment, and sociological impacts generated by the Proposed Action and the proposed alternatives, including direct, indirect, or cumulative impacts commensurate with their importance as identified by the scoping process. *See* Minn. R. 4410.2300, item H.

97. The Draft EIS discussion of impacts for the Proposed Project is summarized by issue area below:

Water Resources:
Significant adverse effects to water resources identified for the Proposed Action included:

- *Maximum Contaminant Levels.* Levels of antimony, manganese, and nickel in mine site groundwater were predicted to exceed USEPA primary Maximum Contaminant Levels (MCLs) or MDH Health Risk Limits, potentially for the long term at the Mine Site. Sulfate would exceed the groundwater evaluation criterion of 250 mg/L.

- *Overflow.* West Pit overflow in closure was predicted to initially exceed standards for arsenic, cobalt, copper, nickel, and selenium, but water quality was expected to improve over time and exceedances could be mitigated.

- *Groundwater Seepage.* The quantity of groundwater seepage downgradient of the Tailings Basin would exceed aquifer flux capacity resulting in significant seepage upwelling and wetland impacts. The quality of groundwater seepage downgradient from the Tailings Basin would

generally meet groundwater evaluation criteria with the exception of aluminum. Aluminum would exceed the USEPA secondary MCL standard for managing aesthetic considerations (not to protect human health), and is naturally found in elevated concentrations in the Project area.

- *Mercury.* Relatively high sulfate concentrations in seepage from the Tailings Basin would be released to wetlands north of the Tailings Basin and lakes downstream on the Embarrass River the chemical interaction between these high sulfate concentrations and wetlands pose "high risk situations" for mercury methylation. There is some uncertainty about whether the West Pit overflow would meet the Lake Superior mercury standard, but this impact could be mitigated if it occurred.

Geotechnical Stability:
After evaluating the geotechnical stability of the Proposed Action, the Draft EIS concluded that the NorthMet Tailings Basin and Hydrometallurgical Residue Facility embankments would have a low margin of safety due to fine tailings and underlying soils in the existing LTVSMC Tailings Basin.

Other Impacts:
The Draft EIS also identified impacts on wetlands, vegetation, wildlife, fish and macroinvertebrates, air quality, cultural resources, as well as the socioeconomic impacts of the Proposed Project and the Proposed Project's attendant cumulative effects.

98. Chapter 6 of the Draft EIS discussed irreversible and irretrievable commitment of resources which would be involved in the proposal should it be implemented. *See* 40 CFR § 1502.16.

99. The Draft EIS incorporated material into the Draft EIS by reference to reduce the bulk of the document without impeding governmental and public review of the project. All material incorporated by reference was made available for inspection by interested persons within the time allowed for comment. References are listed in Draft EIS Chapter 7. *See* Minn. R. 4410.2400.

8. 2009 Draft EIS—Major Differences of Opinion and Points of View

100. Chapter 4 of the Draft EIS identified and disclosed major differences of opinion and points of view of the Bois Forte Band of Chippewa, the Fond du Lac Band of Lake Superior Chippewa, and the Grand Portage Band of Lake Superior Chippewa (collectively, "Tribal Cooperating Agencies") regarding the impacts of the proposed project and alternatives. Appendix D listed Tribal Positions on the July 2009 PDEIS. *See* Minn. R. 4410.2300, item H. *See* § 40 CFR 1502.9(a).

9. 2009 Draft EIS—Public Review and Comment

101. DNR distributed the Draft EIS to all required parties, and provided an executive summary of the Draft EIS to all persons who submitted substantial comments on the Scoping EAW and Draft Scope, as well as any other person who requested the document, Minn. R. 4100.2600, subparts 3 and 4. DNR publicized the Draft EIS by other means, including publishing it in the EQB Monitor, issuing a press release to numerous newspapers at least one of which was a newspaper of general circulation, and by hosting two public informational meetings. *See* Minn. R. 4410.2600, subps. 6 and 8.

102. A notice of availability of the Draft EIS was published in the November 2, 2009, edition of the EQB *Monitor* (Vol. 33, No. 22). *See* Minn. R. 4410.2600, subp. 5.

103. The EQB *Monitor* notice included the date, time, and location of the public informational meetings, notice of where copies of the Draft EIS were available for public review, and indicated the comment period closure date and time (February 3, 2010, at 4:30 PM). *See* Minn. R. 4410.2600, subp. 7.

104. DNR issued a statewide press release on November 2, 2009, to numerous news sources including newspapers of general circulation in the vicinity of the Project. The press release included the date, time, and location of the public informational meetings, notice of where the copies of the Draft EIS were available for public review, and indicated the comment period closure date and time (February 3, 2010, at 4:30 PM). *See* Minn. R. 4410.2600, subp. 6.

105. The USACE issued a Notice of Draft EIS Availability in the November 6, 2009, *Federal Register* (Vol. 74, No. 214) indicating the comment period would end on February 3, 2010.

106. The Co-lead Agencies conducted two (2) public informational meetings on December 9, 2009 in Aurora, St. Louis County Minnesota and December 10, 2009 in Blaine, Minnesota. Both written and oral public comments were received, and a transcript of the meeting(s) was made. *See* Minn. R. 4410.2600, subp 2. *See* Minn. R. 4410.2600, subp. 8.

107. The 90-day public comment period on the Draft EIS ended on February 3, 2010, at 4:30 PM, which was not less than ten days after the second public information meeting. *See* Minn. R. 4410.2600, subp. 9.

108. The Co-lead Agencies received 3,822 submissions during the public comment period, of which 167 constituted transcribed verbal comments on the Draft EIS transcribed from comments made during the public informational meetings.

109. The U.S. Environmental Protection Agency (USEPA) reviews all federal EIS documents and publishes its review in the public record. *See* 42 U.S.C. § 7609.

110. The USEPA rated the Draft EIS as EU-3 (Environmentally Unsatisfactory – Inadequate) for impacts to wetlands, water quality, and other issues described in the agency's comments on the Draft EIS. The rating was provided in USEPA comments on the Draft EIS of February 18, 2010. *See* 42 U.S.C. § 7609.

D. 2013 Supplemental Draft EIS

111. Three factors led the Co-Lead Agencies to prepare a supplemental Draft EIS: (1) USEPA's rating of the 2009 Draft EIS as EU-3 (Environmentally Unsatisfactory — Inadequate); (2) addition of the USFS Land Exchange with the Project Proposer as a connected action; and (3) project changes identified by the Proposer, and project changes and mitigation proposed to address adverse impacts identified in the Draft EIS and comments submitted on the Draft EIS. The opportunity for public input and participation in the Supplemental Draft EIS process exceeded requirements of Minnesota law.

Minnesota Rule part 4410.3000 envisions supplementing a final EIS but no provision is made for supplementing a draft EIS. Federal law, however, permits supplementing a federal draft EIS where changes in the proposed action result in significant environmental impacts not previously evaluated or where new information or circumstances relating to the proposed action would result in significant environmental impacts not evaluated in the draft EIS. *See* 42 CFR § 1502.9 Because environmental review was intended to serve both the federal and state environmental review procedures as permitted by Minn. R. 4410.3900, the Co-lead Agencies proceeded to prepare a draft supplemental EIS

The proposed project was therefore substantially refined: (1) to address waste management and water quality concerns, including additional water treatment to control sulfate while meeting the Great Lakes Initiative mercury standard; (2) to reduce wetland impacts; and (3) to reduce waste rock stored on the land surface. The 2013 Supplemental Draft EIS also included more thorough analysis and modeling of the potential effects on groundwater and surface waters, as well as information about the land exchange between the Proposer and the USFS, and more information on Financial Assurance.

Like the 2009 Draft EIS, the proposed project would retain three mining pits. However, the operational details for the project in the 2013 Supplemental Draft EIS differed from those identified in the Draft EIS. In the design evaluated in the supplement, mining in the East and West Pits would occur simultaneously. Mining in the East Pit would finish around year 11, at which point mining in the Central Pit would begin. Ultimately, the East and Central Pits would be combined into one larger pit. Furthermore, the project would feature a permanent Category 1 waste rock stockpile with a containment system (and a cover at closure), and temporary Category 2/3 and Category 4 stockpiles with liner systems. Eventually, the Category 2/3 and Category 4 waste rock would be moved into the East Pit for subaqueous disposal after mining in the East Pit was completed in year 11. Waste rock from ongoing mining in the West Pit and Central Pit after year 11 would be deposited in the East Pit, with some Category 1 waste rock going into the Category 1 waste rock stockpile. Other features included: a wastewater treatment facility ("WWTF") at the mine site (upgraded in closure to include reverse osmosis), a waste water treatment plant ("WWTP") at the Plant Site that would use reverse osmosis, an upgraded tailings basin facility with rock buttressing on the former LTVSMC tailings basis, among many other changes.

1. 2013 Supplemental Draft EIS—Proposed Land Exchange Summary

112. A determination was made that the NorthMet Mining Project and Land Exchange are two projects that constitute connected actions and should be considered together in the Supplemental Draft EIS. *See* Minn. R. 4410.0200, subp. 9c. *See* Minn. R. 4410.2000, subp. 4.

113. The NorthMet Deposit is located on National Forest System (NFS) lands within the Superior National Forest. The mineral rights associated with these lands were reserved by the original private owner when the United States purchased the land for National Forest purposes under the authority of the Weeks Act (16 U.S.C. § 515). Those mineral interests remain privately owned and are now controlled by the Proposer. USFS contends that the mineral rights that were reserved to the owner of the mineral estate do not include the right to surface mine as proposed by the Project Proponent. Consequently, the Proposer proposed a land exchange ("Land Exchange") that would involve the

USFS conveying the land at the NorthMet mine site to the Proposer in exchange for land of at least equal value in northeastern Minnesota that would become a part of the Superior National Forest. This constituted a significant new circumstance, or information relevant to environmental concerns and bearing on the proposed action or its impacts.

114. A Notice of Intent to prepare a supplemental draft EIS was published in the *Federal Register* (Vol. 75, No. 197) on October 13, 2010. The notice specified that the USACE and USFS would both serve as the lead federal agencies. DNR would remain the lead state agency.

115. The USFS initiated a 45-day public scoping period on the proposed land exchange concurrent with the *Federal Register* Notice of Intent publication on October 13, 2010. The scoping comment period closed on November 27, 2010. The scoping comments would be used to determine significant issues associated with the land exchange, develop alternatives to the proposed exchange, determine the scope of the analysis, and refine the analysis of effects.

116. DNR published a Notice of Amendment to EIS Scoping Decision in the EQB *Monitor* (Vol. 34, No. 22) on November 1, 2010. The notice was published because substantial new information arose related to the proposed project that significantly impacted the potential effects of the proposed project or the availability of prudent and feasible alternatives to the project. Information supplied with the Notice of Intent identified in Finding of Fact paragraph 114 included a description of lands that would come into federal ownership in a proposed land exchange between the USFS and Proposer. *See* Minn. R. 4410.2100, subp. 8.

117. The USFS issued a Detailed Scoping Report for the Land Exchange in May 2011. Potentially significant issues identified included the development of exchange alternatives, tribal access rights, and federal trust obligations. Other issues included air quality, climate change, cultural/tribal concerns, cumulative effects, ecological functions and values, forest resources, hazardous materials, market value and legal implications, conformance with the USFS Forest Plan, socioeconomics, threatened and endangered species, vegetation and wildlife habitat, water resources, and wetland effects. Issues considered but eliminated from further consideration regarding the Land Exchange included mining-related effects, corporate profits resulting from the Land Exchange, land value disclosures, and adequacy of scoping materials.

2. 2013 Supplemental Draft EIS—Cooperating Agencies

118. Pursuant to Federal policy, USEPA, on June 27, 2011, entered into a MOU to become a cooperating agency to consult on the development of the joint state-federal EIS for the NorthMet Mining Project and Land Exchange. USEPA agreed to become a cooperating agency in order to participate in resolving issues identified in USEPA's February 18, 2010, comment letter on the Draft EIS (see Finding of Fact paragraph 110) and to inform the future Supplemental Draft EIS and Final EIS regarding the agency's regulatory interests. *See* 40 CFR § 1501.6

119. Because the May 19, 2008 MOU was outdated, the USACE and DNR, on June 6, 2011 terminated the MOU identified in Finding of Fact paragraph 88 with the Tribal Cooperating Agencies.

120. The Co-lead Agencies then invited the Tribal Cooperating Agencies to continue as cooperating agencies and to provide their special expertise in the preparation of the NorthMet Mining Project and Land Exchange EIS.

121. In correspondence to the USACE dated July 8, 2011, the Grand Portage Band of Lake Superior Chippewa indicated it would continue as a cooperating agency for the purpose of preparing the NorthMet Mining Project and Land Exchange Supplemental Draft EIS and Final EIS. The Fond du Lac Band of Lake Superior Chippewa also indicated it would continue as a cooperating agency in correspondence to the USACE dated July 9, 2011, and, in July 11, 2011, the Bois Fort Band of Chippewa wrote to USACE that it would continue as a cooperating agency.

122. The Co-lead Agencies prepared and approved a Project Management Coordination and Communication Plan (CCP), February 8, 2013. The Co-lead Agencies and the Tribal Cooperating Agencies mutually agreed to use the CCP in lieu of an MOU. Each of the Co-lead Agencies are signatories to the CCP. While the Co-lead Agencies consulted the Tribal Cooperating Agencies, ultimately the Tribal Cooperating Agencies did not sign the CCP. Nonetheless, the Co-lead Agencies and the Tribal Cooperating Agencies mutually agreed to be guided by the CCP.

3. 2013 Supplemental Draft EIS—Interdisciplinary Preparation

123. The DNR entered into a second State of Minnesota Professional and Technical Services Contract With ERM on April 4, 2011, so that ERM could continue to provide services to DNR staff in preparing the EIS for the proposed project. Distinct from the Cooperating Agency MOU a separate MOU was needed between the Co-lead Agencies and proposer. The Co-lead Agencies, the Proposer, entered into an MOU for the purpose of preparing a joint state/federal supplemental EIS on June 20, 2011. The MOU authorized the evaluation of the NorthMet Mining Project and Land Exchange in accordance with the NEPA and MEPA. This MOU superseded and terminated the revised MOU dated May 19, 2008.

4. 2013 Supplemental Draft EIS—Comments and Responses to Comments on the 2009 Draft EIS

124. As a first step in preparing the Supplemental Draft EIS, the Co-lead Agencies used a content-based thematic approach to respond to the large number of submissions received on the 2009 Draft EIS. Each submission and comment was grouped with other submissions and comments on the same topic. Each topic was referred to as an *issue*, and then comments on each of the 17 issues were further subdivided into the specific matter they addressed, known as a *theme.*

Following is a listing of the issues derived from substantive content of the comments on the 2009 Draft EIS to be addressed for the Supplemental Draft EIS:

Comparison of Alternatives	Project Description
Air Quality	Process
Compatibility with Plans and Land Use	Socioeconomics
Cultural Resources	Vegetation
Fish and Macroinvertebrates – Aquatic Species	Visual Resources

Geotechnical Stability	Wetlands
Hazardous Materials	Wildlife
Irreversible and Irretrievable Commitment of Resources	Water Resources
Noise	

A thematic response was provided for each comment submitted on a particular theme. The content of the thematic response was commensurate with the importance of the impact, for comparing alternatives, and for identifying mitigation. The Co-lead Agencies made changes to the proposed project and altered their analysis in response to many of the comments. Moreover, the Co-lead Agencies relied on some of the comments they received in response to the Draft EIS in preparing the Supplemental EIS.

Similar to state regulations, NEPA requires lead agencies to consider and assess comments. *See* 40 CFR § 1503.4. Possible responses on the comments submitted on Draft and Supplemental Draft EISs include:

- Modify alternatives including the proposed action.
- Develop and evaluate alternatives not previously given serious consideration by the agency.
- Supplement, improve, or modify its analyses.
- Make factual corrections.
- Explain why the comments do not warrant further agency response, citing the sources, authorities, or reasons that support the agency's position.

5. 2013 Supplemental Draft EIS—Agencies Draft Alternative

125. In considering the comments from the public and other state and federal agencies, including the USEPA, and Tribal Agencies' comments and concerns, the Co-lead Agencies established the Agencies Draft Alternative on January 10, 2011. In consultation with the Proposer, the alternative was designed to resolve major environmental concerns raised in comments on the 2009 Draft EIS by incorporating reasonable mitigation measures for the proposed project. *See* Minn. R. 4410.2300, item G.

126. The Proposer adopted the substantive elements of the Agencies Draft Alternative identified in Finding of Fact paragraph 125 that became the proposed NorthMet Mining Project. *See* Minn. R. 4410.2300, item G.

6. 2013 Supplemental Draft EIS – Material Changes

127. The Co-lead Agencies prepared the 2013 Supplemental Draft EIS, which incorporated revisions reflecting public comments on the 2009 Draft EIS which complied with Minn. R. 4410.2300 The

sections of the 2013 Supplemental Draft EIS which have substantial changes are as follows: Proposed Action and Alternatives; Affected Environment; Environmental Consequences; Cumulative Effects; Major Differences of Opinion; and Appendices, including: Appendix A - Thematic Responses to DEIS Comments; Appendix B – Underground Mining Alternative Position Paper; and Appendix C – Tribal Position Supporting Information. These changes are identified below.

128. The Supplemental Draft EIS included material changes to the proposed project based, in part, on the comments received on the Draft EIS. These changes included, but are not limited to:

- *Underwater Disposal.* In-pit underwater disposal of the most reactive waste rock to minimize chemical reactions that could affect water quality.

- *Wastewater Treatment.* The construction and operation of wastewater treatment facilities at both the mine and plant sites for active treatment of water captured on-site for as long as required to meet water quality standards.

- *Water Capture.* Enhancements of water capture systems at the rock stockpiles and tailings basin. Water captured by these systems would then be treated at the wastewater treatment facilities.

- *Tailings Basin – Water Quality Performance.* The addition of bentonite to the top and side walls of the tailings basin to reduce oxygen transfer in the waste tails to improve water quality performance.

- *Residue Facility.* The placement of the double-lined Hydrometallurgical Residue Facility on a brownfield site (next to the tailings basin).

129. The Supplemental Draft EIS included material changes to the water quality impact assessment modeling based, in part, on the comments received on the Draft EIS. Whereas the Draft EIS relied on deterministic simulations with separate uncertainty analyses, the 2013 Supplemental Draft EIS relied on probabilistic simulations that included uncertainty and variability around many of the model input assumptions. Temporally, the 2009 Draft EIS used discrete points in time with interpolation (deterministic), while the 2013 Supplemental Draft EIS was continuous through time until near steady-state conditions were reached (probabilistic). Other changes included, but were not limited to:

- *Modeling Platform.* GoldSim was selected as the probabilistic modeling platform for the assessment of water quality impacts.

- *Evaluation Threshold.* The 90th percentile probability (P90) was selected as the evaluation threshold to determine whether the model results met the evaluation criteria that had been established by the Co-lead Agencies. Relying on the P90 threshold is considered an improvement over the Draft EIS methodology because it generally equated to a low probability scenario and has been used for other mining projects where probabilistic modeling was used. However, the option of modifying the evaluation criteria to another value (other Probability values) was retained based on consideration of low-flow conditions, site-specific factors, and model predictions considering applicable permitting regulations and guidance.

- *Time Steps.* The co-lead Agencies decided that the water quality model would be run on monthly time steps for 200 years at the Mine Site and 500 years at the Plant Site.
- *Data Update.* Baseline water quality data was updated for data collected since the 2009 Draft EIS.
- *Constituents Modeled.* The number of modeled constituents was expanded from eight in the 2009 Draft EIS) to 27 in the 2013 Supplemental Draft EIS to include all inorganic constituents with drinking water standards.
- *Model Verification*. ERM independently assessed the model to confirm it used the correct parameter values and that the major model results could be reproduced using independent calculations.

7. 2013 Supplemental Draft EIS—Alternatives Considered for the Supplemental Draft EIS

130. Alternatives screened against the criteria identified in Finding of Fact 92 and carried forward to be addressed in the Supplemental Draft EIS included:

Mine Site Alternative. The Mine Site Alternative from the Draft EIS was integrated into the proposed project and addressed in the Supplemental Draft EIS in the proposed action. The Draft EIS's consideration of chemical modification of reactive waste rock stockpiles was not incorporated into the revisions made to the Proposed Project. The changes to waste rock management, which were incorporated into the Proposed Project, negated the need for chemical modifications to waste rock as a mitigation measure.

Draft EIS – Tailings Basin Alternative. Aspects of the Tailings Basin Alternative from the Draft EIS were integrated into the proposed project and addressed in the Supplemental Draft EIS in the proposed action. These elements included:

- *Northern Embankment Reinforcement.* Reinforcement of the northern embankment with a rock buttress to increase geotechnical stability.
- *Collection Systems.* Addition of a collection system to capture seepage designed to route water from the collection system back to the tailings pond for reuse as process water.
- *Closure Cover System.* A closure cover system was added to reduce the influx of water and oxygen. Instead of a partial dry cap, the proposed project relies on a bentonite amendment applied to the outer sideslopes of the embankments, along the beach areas of the tailings basin, and to the tailings under the pond.

131. The Co-lead Agencies rescreened the following alternatives against the criteria from Finding of Fact paragraph 92 and reaffirmed their exclusion from the EIS:

Underground Mining Alternative. This alternative was reconsidered in the 2013 Supplemental Draft EIS because of high level of interest from the Cooperating Agencies, comments on the 2009 Draft EIS, and because it was identified as an issue requiring further assessment during scoping for the Land Exchange. The 2013 Supplemental Draft EIS acknowledged that underground mining offered environmental benefits over the proposed project. However, in considering the technical, operational, and economic aspects of an underground mine at the NorthMet deposit, the tonnage/volume and grade (of metals) of rock would not generate sufficient revenue to pay for the costs of the mining. The Co-lead Agencies weighed the environmental benefits against the impact on technical, operation, and economic considerations and determined that the underground mining alternative was not reasonable and would not meet the purpose and need of the project.

West Pit Backfill. This alternative was reconsidered in greater detail for the Supplemental Draft EIS because it was identified by Tribal Cooperating Agencies as a potential mitigation option to minimize certain impacts at the Mine Site. The Supplemental Draft EIS acknowledged that backfilling the West Pit offered a mix of environmental benefits and new adverse impacts relative to the proposed project. The economics of backfilling, encumbrance compensation, and water treatment requirements rendered this alternative inconsistent with the project's purpose and need.

8. 2013 Supplemental Draft EIS—Alternatives Compared in the Supplemental Draft EIS

132. The Supplemental Draft EIS compared the potentially significant impacts of the proposal with those of other reasonable alternatives to the proposed project. *See* Minn. R. 4410.2300, item G.

Proposed Alternative (NorthMet Mining Project). The proposed project was analyzed in the Supplemental Draft EIS pursuant to the requirements of NEPA and MEPA. The proposed project components included:

- Three separate open mine pits (East, Central, and West Pits); mining simultaneously in East and West Pits; mining in East Pit finishes around year 11, when mining in Central Pit begins; the Central Pit would be mined between years 11 and 16, and would ultimately be combined with the East Pit into one large pit; mining would continue in the West Pit until year 20.

- Waste rock stockpiles

    - Permanent Category 1 stockpile with a containment system (and a cover in closure).
    - Temporary Category 2/3 and Category 4 stockpiles with liner systems.
    - Category 2/3 and Category 4 waste rock would be moved into the East Pit for subaqueous disposal after mining in the East Pit is complete in year 11.
    - Waste rock from ongoing mining in the West Pit and Central Pit after year 11 would be directly disposed of in the East Pit, with some Category 1 waste rock going to the Category 1 waste rock stockpile.

- Wastewater treatment facility (WWTF) at Mine Site (upgraded in closure to include reverse osmosis).

- Wastewater treatment plant (WWTP) at Plant Site that would use reverse osmosis.

- Pilot testing of non-mechanical treatment systems at both the WWTF and WWTP to achieve future water quality criteria without the need for mechanical treatment.

- Treated water would be used for stream augmentation.

- Upgraded tailings basin facility with rock buttressing on the former LTVSMC tailings basin.

- Bentonite clay incorporated into the outer side-slopes of the tailings basin to limit oxidation and reduce pollutants.

- A seepage containment system around the northern and western sides of the tailings basin.

- A hydrometallurgical residue facility at the Plant Site, double lined and separate from the tailings basin.

Proposed Alternative (Land Exchange). The Land Exchange Proposed Action would involve the transfer of 6,650.2 acres (General Land Office [GLO]) of federal lands from public to private ownership, and up to 6,722.5 acres (GLO) of land from private to public ownership, depending upon the results of the environmental analysis and real estate appraisals.

The alternatives to the proposed connected actions NorthMet Mining Project and Land Exchange addressed in the Supplemental Draft EIS are:

Land Exchange Alternative B. Proposed Connected Actions Alternative B included the NorthMet Project Proposed Action but provided a land exchange with a smaller federal parcel. Compared to the Land Exchange Proposed Action, Land Exchange Alternative B would convey fewer acres of federal land (4,900.7 [GLO] acres) for fewer acres of non-federal land (4,651.5 [GLO] acres contained within a single tract).

No Action Alternative. Under the No Action Alternative, the NorthMet Project Proposed Action would not be implemented and no land exchange would take place. The USFS would continue to manage the lands in accordance with the Forest Plan. Private lands would not be acquired in exchange for the USFS lands at the Mine Site. At the Mine Site, the Proposer would be required, under existing exploration approvals, to reclaim surface disturbance associated with exploratory and development drilling activities. No further upgrades or new segments would be constructed along the existing power transmission line, railroad, or Dunka Road, each of which would continue to be used by their private owners. At the former LTVSMC processing plant and Tailings Basin, the land owner, Cliffs Erie, would continue to complete closure and reclamation activities as specified under state permits and plans, and the Consent Decree imposing clean-up obligations on Cliffs Erie.

9. 2013 Supplemental Draft EIS—Impacts Addressed

133. The Supplemental Draft EIS addresses potentially significant adverse or beneficial environmental, economic, employment, and sociological impacts generated by the Proposed Action and the Land Exchange. The document evaluated direct, indirect, and cumulative impacts commensurate with their importance as identified by the scoping process. *See* Minn. R. 4410.2300, item H.

i. NorthMet Mining Project

134. The Supplemental Draft EIS discussion of impacts for the proposed NorthMet Mining Project is summarized by issue area below:

Water Resources.

The Supplemental EIS evaluated the proposed project's impact on Embarrass River and Partridge River watersheds water quality. It predicted that the proposed project would not cause or increase the magnitude of exceedance of the groundwater and surface water evaluation criteria at a 90 percent confidence level for any of 28 solutes at 29 evaluation locations, with two exceptions, aluminum and lead:

- *Aluminum*. Water quality model results predict concentrations would increase the existing surface water exceedance at five evaluation locations north of the Tailings Basin in the Embarrass River watershed. Containment system capture of seepage would result in less dilution, thus increasing the proportion of non-contact surface water runoff with higher natural aluminum concentrations reaching the tributary streams.

- *Lead*. Water quality model results predict an exceedance of the lead surface water evaluation criterion in Unnamed Creek and Trimble Creek north of the Tailings Basin. These exceedances would result from the capture and removal of dissolved solids by the Plant Site WWTP in concert with the associated decrease in the hardness-based lead evaluation criterion.

- *Sulfate.* The Co-lead Agencies anticipate no significant changes to sulfate concentrations in the Partridge River. Project implementation would decrease sulfate concentrations in the Embarrass River.

- *Contact Water*. Nearly all contact or process water generated by the proposed NorthMet Mining Project would be treated at the Mine Site WWTF or Plant Site WWTP before release to the environment.

- *Groundwater Seepage*. At the Mine Site, about 10 gallons per minute of untreated water would be released to groundwater during closure, which represents less than five percent of total Mine Site water releases. At the Tailings Basin, about 21 gallons per minute of untreated water would be released during closure (all related to Tailings Basin seepage that bypasses the groundwater

containment system), which represents less than one percent of total Tailings Basin water releases.

- *Water Flows*. The evaluation anticipates no significant changes to groundwater and surface water flows.

- *Mercury*. The mass balance modeling and analog data from other natural lakes and mine pit lakes in northeastern Minnesota suggest that the mercury concentration in the West Pit Lake, which is the only surface water discharge at the Mine Site, would stabilize below the Great Lakes Initiative (GLI) standard of 1.3 ng/L at approximately 0.9 ng/L. The mercury concentration in seepage to groundwater from the Tailings Basin is also anticipated to be below the GLI standard. The NorthMet Mining Project is predicted to increase mercury loadings in the Embarrass River Watershed (still within standards) but decrease mercury loadings in the Partridge River.

- *Methylmercury*. There are several factors that appear to influence mercury methylation, including total available mercury, organic carbon, temperature, micronutrients required by sulfate-reducing bacteria, sulfate loadings, and certain hydrologic conditions. The proposed project is expected to have little or no effect on most of these factors with the exception of sulfate loadings and hydrologic conditions. The proposed project would have negligible effects on hydrologic changes in the Partridge and Embarrass Rivers, would maintain relatively low sulfate loadings to the Partridge River, and would reduce sulfate loadings to the Embarrass River. These changes in sulfate loadings and hydrologic conditions are not expected to promote mercury methylation.

Wetlands.

- *Direct Impacts*. The proposed NorthMet Mining Project would directly affect 912.5 acres of wetlands located within the NorthMet Project area, mostly within the Mine Site. The wetlands at the Mine Site would be permanently lost.

- *Indirect Impacts*. The acreage of wetlands in and around the project area that could be indirectly affected by the proposed NorthMet Mining Project varies depending on the method of calculation used. Up to 7,350.7 acres of wetlands could be indirectly affected based on the analog method of assessing indirect wetland impacts.

Vegetation.

- *Vegetative Cover*. The proposed Project would disturb approximately 2,177.5 acres of vegetative cover at the Plant Site and approximately 1,718.6 acres of vegetative cover at the Mine Site.

- *Invasive Species*. Disturbances associated with the construction of the Mine Site would result in exposed soil surfaces that would have the potential for colonization by invasive species.

- *Biodiversity Significance*. The Project could affect 1,718.6 acres of Minnesota Biological Survey (MBS) Sites of High Biodiversity Significance, 698.2 acres of "imperiled-vulnerable" or "vulnerable" native plant communities, 92.6 acres of "apparently secure" native plant communities, and 178.9 acres of "widespread and secure" native plant communities.

- *Listed Species*. The Project would have direct effects to nine species of state-listed protected plants with indirect effects to two species. There would be no impacts to federally-listed plant species.

Wildlife.

- *Federally-Listed Species*. At the time of the 2013 Supplemental Draft EIS one federally listed species, the Canada lynx, could be affected by localized direct decrease and fragmentation of critical habitat and by the increased potential (albeit low) for incidental take resulting from vehicular collisions due to increased project-related traffic.

- *State-Listed Species*. Four additional state-listed species, the gray wolf, the eastern heather vole, the wood turtle, and the yellow rail, could be affected.

Fish and Macroinvertebrates.

- *Habitat*. Water flows could be lower in several tributary streams to the Partridge and Embarrass rivers, but the flows would remain within the range of annual natural variability. Therefore, changes in flow are not anticipated to result in any measurable effects on existing aquatic habitat in any streams downstream of the NorthMet Project area.

Air Quality.

- *Air Pollutants*. Criteria air pollutants would be generated during construction, mining, and processing activities, though they would be less than applicable Prevention of Significant Deterioration emissions thresholds. Air pollutants with risk guideline values for assessing human health effects were all predicted at levels below state and federal risk guidelines.

- *Visibility*. The proposed project would not adversely affect visibility in nearby Class I areas, such as the Boundary Waters Canoe Area Wilderness (BWCAW) and Voyageurs National Park.

- *Green House Gases (GHG)*. Total direct GHG emissions are less than 100,000 tons per year of CO2 and would not exceed the USEPA major source thresholds for GHGs.

Cultural Resources.

- *No Adverse Effects*. Based on preliminary evaluations, there would be no adverse effect on the Sugarbush or the Erie Mining Company Railroad Mine and Plant Track.

- *Adverse Effects*. A segment of the *Mesabe Widjiu (or Laurentian Divide)*, a segment of the Beaver Bay to Lake Vermilion Trail, and the Erie Mining Company Concentrator Building would be adversely affected by the NorthMet Project Proposed Action.

Socioeconomics.

- *Beneficial Effects*. The project would result in a local increase in employment and spending. Federal, state and local tax revenues would also increase.

Geotechnical Stability.

- *Factor of Safety*. Conceptual designs of the waste rock stockpiles, Tailings Basin, and Hydrometallurgical Residue Facility were developed and assessed, through an iterative design and model process. These project features would meet Minnesota Dam Safety standards.

Cumulative Effects.

- *Additive Effects*. The NorthMet Mining Project and Land Exchange would cause some additive effects on certain resources, such as loss of vegetation and wetlands in the project vicinity. There would be changes in water quality and use, air quality, and increased economic activity for the life of the mine.

- *Reduced Effects from the Project*. After the proposed mitigation and adaptive management measures are applied, the project's contribution to cumulative effects to water quantity and quality, air quality, wetlands, and vegetation would be reduced.

- *Listed Species*. No listed plant or animal species would be cumulatively affected.

ii. Land Exchange

The Supplemental Draft EIS discussion of impacts for the proposed Land Exchange, in terms of net changes to the federal estate (i.e. federal ownership) – the Superior National Forest – that would occur as a result of the action, is summarized by issue area below:

Land Use.

- *Federal Ownership*. The Proposed Project would produce a net increase to the federal estate of about 580 acres of publicly owned land in the 1854 Ceded Territory.

Water Resources.

- *Public Waters*. The Proposed Project would result in a net increase to the federal estate of about 95 acres of DNR-designated public water lakes (2 miles of shoreline) and 5 miles of public water streams.

- *Wild Rice*. The Proposed Project would result in a net increase to the federal estate of wild rice beds in Hay Lake which contains known wild rice beds (approximately 126 acres).

Wetlands.

- *Additional Acreage*. The Proposed Project would result in a net increase to the federal estate of about 506 acres of wetlands.

- *Floodplains*. The Proposed Project would decrease floodplains in the federal estate by about 1,401 acres; however, these floodplains are not Federal Emergency Management Agency (FEMA) regulatory floodplains. There would be no decrease in the amount of regulatory floodplain or increase in the flood damage potential.

- *Waterways*. The Proposed Project would result in a net increase in waterway acreage and frontage within the federal estate.

Vegetation.

- *Cover Type*. The Proposed Project would result in a net increase to the federal estate of about 580 acres of vegetation land cover types.

- *Landscape*. The Proposed Project would result in a net increase to the federal estate of about 625 acres of landscape ecosystems.

- *Listed Species*. The 11 listed plant species at the Mine Site are not known to occur in the lands proposed for the exchange so they would be lost to the federal estate. The lands proposed for the exchange contain two different listed plant species so they would be added to the federal estate.

Wildlife.

- *Habitat*. The Proposed Project would result in a net increase to the federal estate of about 580 acres of vegetation land cover types for wildlife habitat.

- *Canada Lynx*. The Proposed Project would have mixed effects for the Canada lynx. It would increase suitable habitat to the federal estate for lynx and for snowshoe hare (prey species),. There would be a decrease of denning habitat and a decrease of habitat within designated Lynx Analysis Units (LAUs). Designated critical lynx habitat would not change regardless of ownership.

- *Habitat-State Listed Species*. There would be a net increase to the federal estate of the number of occurrences and habitat availability for four state-listed species, which included the gray wolf, the bald eagle, the Laurentian tiger beetle, and the trumpeter swan.

- *Listed Species*. The Proposed Project would have no expected changes to three additional state-listed species, the wood turtle, the eastern heather vole, and the yellow rail.

Aquatic Species.

- *Connectivity*. There would be some increase in watershed riparian connectivity and aquatic connectivity within the federal estate.

- *Fish*. The Proposed Project would result in a potential increase to the federal estate of nine additional fish species.

  SGCN Species. There would be a potential increase to the federal estate of the habitat for six new potential aquatic Species of Greatest Conservation Need (SGCN).

Socioeconomics.

- *Economic Effects*. The Proposed Project would cause moderate positive economic effects through increased opportunity for forestry and recreation and association employment, earnings, and revenue.

- *Environmental Justice*. The proposed project would not disproportionately affect minority and low income populations including residents of the study area, as well as Band members who use the study area for subsistence. There could be a loss of subsistence resources and opportunities on the conveyed federal lands, and a gain in subsistence resource and opportunities on what are now non-federal lands.

Recreation and Visual Resources.

- *Recreational Opportunities*. There would be a net increase in opportunities for recreational activity within the federal estate.

- *Scenic Integrity*. The Proposed Project would result in a net increase in amount of land controlled by the USFS in the Superior National Forest with Moderate and High Scenic Integrity Objectives.

Wilderness and Other Special Designation Areas.

- *Wilderness Designation*. No net increase or decrease in any wilderness areas would be anticipated.

- *cRNAs*. The Proposed Project would result in a net increase to the federal estate of about 307 acres of candidate Research Natural Areas (cRNAs).

Land Exchange Alternative B. The Supplemental Draft EIS discussion of impacts for the Land Exchange Alternative B indicates that this alternative would have generally the same effects as the

proposed connected actions (NorthMet Mining Project and Land Exchange), but fewer lands would be conveyed through the land exchange. Alternative B would result in a net increase of wetlands to the federal estate, a net decrease of floodplains to the federal estate, a net increase of vegetation land cover types for wildlife habitat to the federal estate, and the remaining federal lands at the Mine Site would not have public access.

No Action. The Supplemental Draft EIS discussion of impacts for the No Action Alternative indicates this alternative would avoid the environmental and social impacts associated with the NorthMet Mining Project and Land Exchange. The social and economic benefits from the Proposed Project, in the form of increased employment and economic revenue, would not occur. Lands proposed for exchange would remain in the federal estate.

135. The Supplemental Draft EIS discussed the irreversible and irretrievable commitment of resources that would be involved in the proposal should it be implemented. *See* 40 CFR § 1502.16.

136. The Supplemental Draft EIS incorporated material into the Supplemental Draft EIS by reference to reduce the bulk of the document without impeding governmental and public review of the project. All material incorporated by reference was made available for inspection by interested persons within the time allowed for comment. References are listed in Supplemental Draft EIS end matter section. *See* Minn. R. 4410.2400.

10. 2013 Supplemental Draft EIS—Major Differences of Opinion and Points of View

137. As part of developing the Supplemental Draft EIS, the Co-lead Agencies engaged the Tribal Cooperating Agencies in efforts to resolve differing opinions and points of view. The major differences of opinion identified in Chapter 8 of the Supplemental Draft EIS represent those areas where resolution could not be achieved.

138. The Supplemental Draft EIS complied with Minnesota and federal regulations by disclosing major differences of opinion and points of view on the impacts of the proposed project and alternatives, in particular for the Tribal Cooperating Agencies in Supplemental Draft EIS Chapter 8 and Appendix C. Similarly, the thematic responses listed in Appendix A of the Supplemental Draft EIS offer major differences of opinion and points of view as provided in public comments on the Draft EIS. The Co-lead Agencies provided thematic responses to comments on the Draft EIS and responded to the Tribal Cooperating Agencies' differences of opinion. S*ee* Minn. R. 4410.2300, item H; *See* 40 CFR § 1502.9(a).

11. 2013 Supplemental Draft EIS—Public Review and Comment

139. Between December 5 and December 7, 2013, DNR distributed the Supplemental Draft EIS to all governmental units with authority to permit or approve the proposed project, the Proposer, all parties on the EQB's Draft EIS distribution list, all parties who submitted substantive comments during EIS scoping and the Draft EIS, and all parties who requested a copy. *See* Minn. R. 4410.2600, subp. 3.

140. An Executive Summary of the Supplemental Draft EIS was supplied to all persons who submitted substantive comments on the Scoping EAW, Draft Scope, and Draft EIS, and any person requesting the Executive Summary. *See* Minn. R. 4410.2600, subp. 4. The copy of the Supplemental Draft EIS provided on December 2, 2013, to the EQB staff served as notification to publish notice of availability of the Supplemental Draft EIS in the EQB *Monitor*. *See* Minn. R. 4410.2600, subp. 5.

141. A notice of availability of the Supplemental Draft EIS was published in the December 9, 2013 edition of the EQB *Monitor* (Vol. 37, No. 25). *See* Minn. R. 4410.2600, subp. 5. The EQB *Monitor* notice included the date, time, and location of the public informational meetings, notice of where copies of the Supplemental Draft EIS were available for public review, and indicated the comment period closure date and time (March 13, 2014, at 4:30 PM). *See* Minn. R. 4410.2600, subp. 7.

142. The DNR issued a statewide press release on December 6, 2013, that included at least one newspaper of general circulation in the vicinity of the Project. The press release provided the date, time, and location of the public informational meetings, notice of where the copies of the Supplemental Draft EIS were available for public review, and indicated the comment period closure date and time (March 13, 2014, at 4:30 PM). *See* Minn. R. 4410.2600, subp. 6.

143. The USACE and USFS issued a Notice of Supplemental Draft EIS Availability in the December 13, 2013, *Federal Register* (Vol. 78, No. 240) indicating the comment period ended on March 13, 2014.

144. The Co-lead Agencies conducted three (3) public informational meetings on January 16, 2014 in Duluth, St. Louis County, Minnesota, January 22, 2014, in Aurora, St. Louis County, Minnesota and January 28, 2014 in St. Paul MN. *See* Minn. R. 4410.2600, subp. 2. Both written and oral public comments were received, and a transcript of each meeting was made. The first meeting was held greater than 15 days after the EQB Monitor notice of the availability of the Supplemental Draft EIS. *See* Minn. R. 4410.2600, subp. 8.

145. The public comment period on the 2013 Supplemental Draft EIS ended on March 13, 2014, at 4:30 PM, which was not less than ten days after the third public information meeting. *See* Minn. R. 4410.2600, subp. 9.

146. The Co-lead Agencies received 57,703 submissions during the public comment period, of which 371 constitute transcribed verbal comments on the Supplemental Draft EIS taken during the public information meetings.

147. The USEPA rated the Supplemental Draft EIS as EC-2 (Environmental Concerns – Insufficient Information). The rating reflects environmental impacts that could be further avoided or mitigated, and additional analysis to assess and avoid or mitigate environmental impacts. The rating was provided in USEPA comments of March 13, 2014 on the Supplemental Draft EIS. *See* 42 U.S.C. § 7609.

E. 2015 Final EIS

148. The Co-lead Agencies determined that changes were required as suggested in the comments on the Draft EIS and Supplemental Draft EIS, thus the draft text was rewritten so that necessary changes in

the text were incorporated in the appropriate places. The changes included text edits, project design modifications, and updated analysis where deemed appropriate in the development of the Final EIS. *See* Minn. R. 4410.2700, subp. 2.

149. The project components included:

- *Mining Options.* Three separate open mine pits (East, Central, and West Pits); mining simultaneously in East and West Pits; mining in East Pit completed around year 11, when mining in Central Pit is to begin; Central Pit would be mined between years 11 and 16, and would ultimately be combined with the East Pit into one large pit; mining would continue in the West Pit until year 20.

- *Waste Rock Stockpiles.*

    - Permanent Category 1 stockpile surrounded by a water containment system and covered at closure.
    - Temporary Category 2/3 and Category 4 stockpiles with liner systems.
    - Category 2/3 and Category 4 waste rock would be moved into the East Pit for subaqueous disposal after mining in the East Pit is complete in year 11.
    - Waste rock from ongoing mining in the West Pit and Central Pit after year 11 would be directly disposed of in the East Pit, with some Category 1 waste rock going to the Category 1 waste rock stockpile.

- *Wastewater Treatment Facility.* WWTF at the Mine Site (upgraded in closure to include reverse osmosis or an equivalently performing technology).

- *Wastewater Treatment Plant.* WWTP at the Plant Site that would use reverse osmosis or an equivalently performing technology.

- *Pilot Testing*. Pilot testing of non-mechanical treatment systems at both the WWTF and WWTP to achieve future water quality criteria without the need for mechanical treatment.

- *Stream Augmentation.* Treated water would be used for stream augmentation.

- *Tailings Basin Facility.* Upgraded tailings basin facility with rock buttressing and cement deep soil mixing for increased stability on the former LTVSMC tailings basin.

- *Tailings Basin Reinforcement.* Bentonite clay incorporated into the outer side-slopes of the tailings basin to limit oxidation and reduce pollutants.

- *Containment System.* A surface and groundwater containment system around the northern, western and eastern sides of the Tailings Basin and improvements to the existing containment system along the southern side of the Tailings Basin.

- *Residue Facility.* A Hydrometallurgical Residue Facility at the Plant Site, double lined and separate from the tailings basin.

- *Coal Ash Landfill.* Removal of existing coal ash landfill in the Tailings Basin and disposal in Hydrometallurgical Residue Facility.

1. 2015 Final EIS—Comments and Response to Comments on the 2013 Supplemental Draft EIS

150. The Co-lead Agencies reviewed and considered substantive public comments received during the 2013 Supplemental Draft EIS public comment period identified in Finding of Fact paragraph 146. Rules governing the federal NEPA process permit federal agencies to consider and respond to comments both individually and collectively. 40 C.F.R. 1503.4(a). Because the volume of comments received on the Supplemental Draft was significantly large and many comments raised similar issues the Co-lead Agencies sorted the comments by content into thematic topics. By organizing comments by theme the Co-lead Agencies could obtain a deeper understanding of the nature of the public concerns around any given issue, address the comments more comprehensively, assure consistent consideration of comments, and increase public transparency through organization. The outcome of the comment review was used to prepare the Final EIS.

Cooperating Agencies provided seven submissions, within which 466 discrete comments were identified. A response was provided for each of these comments, and where applicable each Cooperating Agency comment was assigned to one or more of the themes used to organize the Co-lead Agencies' responses to other public comments.

Following is a listing of the issues assigned to the substantive content of the Supplemental Draft EIS comment letters:

Air Quality	Mercury
Alternatives	Noise and Vibration
Aquatic Species	NEPA and MEPA Considerations
Cultural Resources	Project Description
Cumulative Effects	Permitting and Regulatory Considerations
Financial Assurance	Socioeconomics
General Opinion	USACE 404 Permit
Geotechnical Stability	Vegetation
Hazardous Materials	Wetlands
Human Health	Wildlife Species (Terrestrial)
Land Exchange	Wilderness
Land Use	Water Resources

151. Using the comment review process outlined below, the Co-lead Agencies responded to the timely substantive comments received on the 2013 Supplemental Draft EIS. *See* Minn. R. 4410.2600, subp. 10.

For purposes of developing responses to comments the Co-lead Agencies defined a comment as an individual statement, question, or concern within a submission by a commenter that substantively addresses the proposed project and that contains more than just a statement of approval or disapproval of the project. For purposes of this definition, a single submission by a commenter may have more than one comment. Each comment in the submission was sorted into a thematic area. Each comment was assigned to at least one theme. A total of 580 themes were identified across 23 issue areas. Both comments received at the public informational meeting and timely written comments received during Supplemental Draft EIS public comment period were analyzed. *See* Minn. R. 4410.2700, subp. 1.

For each theme, the Co-lead Agencies developed a concise statement that paraphrased and/or summarized the intent of each group of similar comments for each theme.

152. Responses were provided for each theme statement. The content and level of detail of the responses was commensurate with the importance of the impact and used to compare alternatives, and to identify mitigation. Possible responses to the comments submitted on Draft and Supplemental EISs included:

- Modify alternatives including the proposed action.
- Develop and evaluate alternatives not previously given serious consideration by the agency.
- Supplement, improve, or modify the Co-lead Agencies' analyses.
- Make factual corrections.
- Explain why the comments do not warrant further agency response, citing the sources, authorities, or reasons that support the agencies' position. *See* 40 CFR § 1503.4.

Typically the thematic response took the form of describing how the theme was addressed in the Final EIS. Where applicable, the actual text of the Final EIS was referenced for a more complete response to comments.

2. 2015 Final EIS—Process

153. The Co-lead Agencies prepared a Final EIS which was comprised of changes to the Supplemental Draft EIS text in response to comments on the Draft EIS and Supplemental Draft EIS. The sections of the Final EIS that were substantially changed from the Supplemental Draft EIS were: Water Resources; Wetlands; Aquatic Species; Air Quality; Vegetation; Cultural Resources; and Cumulative Effects. The Final EIS comprises the complete EIS for the proposed project.

154. Changes and additions to the Final EIS based on public comments received and project refinements suggested by the Proposer, included:

- *Human Health Impacts.* A new section was added to the Final EIS that consolidates information about potential human health impacts of the proposed project.

- *Wildlife and Vegetation.* Additional information was added to the Final EIS on potential project effects to moose, northern long-eared bat, gray wolf, other plants and animals, and biodiversity sites.

- *Tailings Basin.* Addition of a seepage collection trench on the east side of the Tailings Basin and remodeling with the addition of this project feature. The Tailings Basin was also revised to include the addition of cement deep soil mixing to the existing basin to increase stability.

- *SAG Mill.* A semi-autogenous grinding (SAG) mill was added to the concentration process.

- *Sewage Treatment.* Updates were made to sanitary sewage treatment at the plant site.

- *Coal Ash Landfill.* The existing coal ash landfill at the plant site was proposed to be removed and coal ash disposal was shifted to the hydrometallurgical residue facility (HRF).

- *Water Treatment.* Pretreatment of all water used in stream augmentation at the plant site.

- *Water Modeling.* The water impact modeling at the mine and plant sites was updated.

- *Northward Flow.* New monitoring requirements and potential mitigation measures were identified to prevent the potential for northward flow of groundwater through bedrock at the mine site.

155. Section 7.3.1 of the Final EIS discussed irreversible and irretrievable commitment of resources that would be involved in the proposal should it be implemented. *See* 40 CFR § 1502.16.

156. Material was incorporated into the Final EIS by reference, and identified in Appendix A, to reduce the bulk of the responses to comments without impeding governmental and public review of the project. All material incorporated by reference in Final EIS and identified in Appendix A was made available for inspection by interested persons within the time allowed for comment. *See* Minn. R. 4410.2400.

157. The Final EIS responded to the timely substantive comments on the Draft EIS and Supplemental Draft EIS in Appendix A. *See* Minn. R. 4410.2600, subp. 10. *See* Minn. R. 4410.2700, subp. 1.

    The attachments to Appendix A of the Final EIS included:

    Draft EIS Submissions;
    Supplemental Draft EIS Submissions;
    All DEIS Comments with Theme Assignments;
    All Supplemental Draft EIS Comments with Theme Assignments; and
    Supplemental Draft EIS Form Letter List.

158. In addition, the following appendices were provided in the Final EIS: Appendix A - Response to Comments on the Draft EIS and Supplemental Draft EIS; Appendix B – Underground Mining Alternative Assessment; Appendix C - Tribal Agency Position Supporting Materials; and Appendix D – Biological Assessment and Biological Evaluation.

159. The Supplemental Draft EIS text was rewritten so that necessary changes in the text were incorporated at the appropriate places, with the Final EIS including the following components: cover sheet; summary; table of contents; list of preparers; project description; list of governmental approvals; discussion of alternatives, including a discussion of why particular alternatives were considered but eliminated; potentially significant environmental and economic impacts identified in scoping; mitigation measures; and appendices containing analysis fundamental to the EIS. The Final Scope did not require permit information to be developed and gathered concurrently with the preparation of the EIS; thus the EIS did not include this component. *See* Minn. R. 4410.2300. *See* Minn. R. 4410.2700, subp. 1.

The Final EIS's treatment of these components is detailed below:

Cover Sheet. The Final EIS has a cover sheet detailing the EIS lead agencies, agency and proposer contacts, abstract, and approvals for release for public comment.

Summary. The Final EIS contains an executive summary.

Table of contents. The Final EIS contains a table of contents.

List of preparers. The Final EIS contains a list of preparers.

List of governmental approvals. Governmental permits and approvals required for the project, including the governmental unit responsible for each action, are listed in Final EIS Section 1.4.4.

Discussion of alternatives. The topic of alternatives, including alternatives eliminated from further consideration in the EIS, is discussed in Final EIS Sections 2.2.3, 3.2.3, and 3.3.3. Additionally, section 7.2 of the Final EIS includes a discussion and comparison of the impacts of the identified reasonable alternatives and potential mitigation measures.

Potentially significant environmental and economic impacts identified in scoping. This topic is addressed in Chapters 4 and 5 of the Final EIS. These chapters detail, by topic, existing conditions and environmental consequences of the project respectively. Final EIS Section 5.2 assesses the Proposed Project and No Action Alternative. Section 5.3 assesses the Land Exchange, Land Exchange Alternative B, and Land Exchange No Action Alternative.

Potential cumulative effects of the Project are addressed in Chapter 6 of the Final EIS. Cumulative effects of the NorthMet Mining Project are assessed in Section 6.2. Cumulative effects of the Land Exchange are assessed in Section 6.3.

Mitigation measures. Measures to avoid, minimize, or compensate for potential adverse impacts are described in Final EIS Chapter 5. Specific sections dedicated to mitigation measures included: Water Resources – 5.2.2.3.5; Wetlands – 5.2.3.3; Vegetation – 5.2.4.2.4; Air Quality – 5.2.7.4; and Geotechnical Stability – 5.2.14.2.1, 5.2.14.2.2, & 5.2.14.2.3. Mitigation-related considerations are also described in Chapter 3, Project Description and Alternatives.

Appendices. The Final EIS contains four (4) appendices. Appendix A is the Response to Comments on the Draft EIS for the NorthMet Mining Project and Supplemental Draft EIS for the NorthMet Mining Project and Land Exchange. Appendix B is the Underground Mining Alternative Assessment for the NorthMet Mining Project and Land Exchange Environmental Impact Statement. Appendix C is the Tribal Agency Position Supporting Materials. Appendix D is the Biological Assessment and Biological Evaluation.

3. 2015 Final EIS—Proposer's Project Modifications

160. The Proposer adopted a series of measures identified as potential project improvements or mitigation measures to be incorporated into the proposed project. These included:

- *Ore Grinding Circuit.* Modifying the ore grinding circuit to include a SAG mill to replace an existing rod mill and ball mill circuit at the Plant Site.

- *Coal Ash Landfill.* Relocating the Coal Ash Landfill from its current location on the east side of Tailings Basin Cell 1E to the Hydrometallurgical Residue Facility, or other approved facility.

- *Tailings Basin.* Extending the Tailings Basin containment system to a portion of the east side of Tailings Basin Cell 1E to collect potential seepage in this area.

- *Stream Augmentation Plan.* Modifying the stream augmentation plan so that only treated water would be discharged to the two Embarrass River tributaries (Trimble Creek and Unnamed Creek) and Second Creek.

- *Rail Cars.* Refurbishing existing rail cars to reduce the potential for ore spillage.

- *Sewage Treatment.* Clarification that the design of the sewage treatment system would include refurbishing the existing collection system and replacing the existing LTVSMC mechanical sewage treatment plant with a stabilization pond that would discharge to the Tailings Basin.

- *Cement Deep Soil Mixing.* Incorporating cement deep soil mixing as an engineering measure to stabilize the existing tailings and peat layers in the northern dams of the LTVSMC Tailings Basin prior to the use of that facility for the NorthMet tailings.

- *Wells*. Increasing the number of bedrock monitoring wells north of the Mine Site to monitor bedrock groundwater elevations and understand bedrock groundwater flow direction.

4. 2015 Final EIS—Alternatives Considered for the Final EIS

161. Alternatives screened against the criteria from Finding of Fact paragraph 92 and carried forward to be addressed in the Final EIS included:

Final Scope Section 2.1 – Proposed Alternative (amended).

The Final EIS addressed the proposed project, defined as the NorthMet Mining Project and Land Exchange, and its associated environmental and socioeconomic effects.

Under this alternative, the Proposer would develop the NorthMet PGE mine and associated processing facilities. The mining would involve open-pit surface methods for approximately 20 years, resulting in production of approximately 32,000 tons per day of ore and 41,000 tons per day of waste rock. The proposed land exchange would involve the USFS conveying the land at the NorthMet mine site to the Proposer. As part of the exchange, the USFS would acquire land of at least equal value that would become a part of the Superior National Forest.

Final Scope Section 2.2 – No Action Alternative.

The Final EIS addressed the expected condition including potential environmental and socioeconomic effects if the proposed project were not developed.

5. 2015 Final EIS—Alternatives Compared in the Final EIS

162. The Final EIS compares the potentially significant impacts of the proposal with those of other reasonable alternatives to the proposed project. *See* Minn. R. 4410.2300, item G.

Proposed Alternative (NorthMet Mining Project). The proposed project was analyzed in the Final EIS pursuant to the requirements of NEPA and MEPA. As identified in Finding of Fact paragraph 149, the proposed project components included: three separate open mine pits (East, Central, and West Pits); waste rock stockpiles; WWTF at Mine Site; WWTP at Plant Site; stream augmentation using treated water; an upgraded tailings basin facility with rock buttressing and cement deep soil mixing for increased stability on the former LTVSMC tailings basin, and bentonite clay to limit oxidation and reduce pollutants; a containment system around the tailings basin; a double-lined hydrometallurgical residue facility at the Plant Site; and relocation of a coal ash landfill to the hydrometallurgical residue facility.

Proposed Alternative (Land Exchange). The proposed land exchange would involve the transfer of about 6,650.2 acres of federal lands from public to private ownership, and up to about 6,722.5 acres of land from private to public ownership, depending upon the results of the environmental analysis and real estate appraisals.

The alternatives to proposed connected actions NorthMet Mining Project and Land Exchange discussed in the Final EIS are:

Land Exchange Alternative B. Proposed Connected Actions Alternative B involves using a smaller federal parcel for the NorthMet Project Proposed Action Compared to the Land Exchange Proposed Action, Land Exchange Alternative B would convey fewer acres of federal land (4,833.7 [GLO] acres) for fewer acres of non-federal land (4,651.5 [GLO] acres).

No Action Alternative. Under the No Action Alternative, the NorthMet Project Proposed Action would not be implemented and no land exchange would take place. The NorthMet Project No Action Alternative would not result in 913.8 acres of direct wetland impacts. The federal government would not exchange lands with the Proposer, and the USFS would continue to manage the lands in accordance with the Forest Plan. Private lands would not be acquired in exchange for the USFS lands at the Mine Site. The Proposer would, however, be required under existing exploration approvals to reclaim surface disturbance associated with exploratory and development drilling activities at the Mine Site. No new upgrades or segments would be constructed along the existing power transmission line, railroad, or Dunka Road, which would continue to be used by their private owners. At the former LTVSMC processing plant and Tailings Basin, the land owner, Cliffs Erie, would continue to complete closure and reclamation activities as specified under state permits and plans, the LTV Bankruptcy Agreements, and the Cliffs Erie Consent Decree.

6. 2015 Final EIS—Impacts Addressed

163. The Final EIS addresses direct, indirect, and cumulative potentially significant adverse or beneficial environmental, economic, employment, and sociological impacts that would result from the project. These impacts were addressed commensurate with their importance as identified by the scoping process. *See* Minn. R. 4410.2300, item H.

i. NorthMet Mining Project

The Final EIS discussion of impacts resulting from the proposed NorthMet Mining Project, including necessary permitting and mitigation, is summarized by issue area below:

Water Resources.

- *Water Quality*. No significant water quality impacts are predicted because: 1) exceedances, within the P90 confidence threshold did not occur; 2) the NorthMet Project Proposed Action concentrations were no higher than concentrations predicted for the Continuation of Existing Conditions (No Action) scenario; 3) the frequency or magnitude of exceedances for NorthMet Project Proposed Action conditions was within an acceptable range; or 4) the effects were not attributable to mining-related discharges. Predicted frequency or magnitude of exceedances in the concentration of lead were within an acceptable range (item 3 above), and exceedances in the concentration of aluminum were not attributable to mining-related discharges (item 4 above).

- *Contact Water*. Nearly all contact or process water generated by the proposed NorthMet Mining Project would be treated at the Mine Site WWTF or Plant Site WWTP before release to the environment.

- *Sulfate*. No significant changes to sulfate concentrations are predicted in the Partridge River, but sulfate concentrations are predicted to significantly decrease in the Embarrass River.

- *Groundwater Seepage*. At the Mine Site, about 10 gallons per minute of untreated water would be released into groundwater during closure. This release represents less than five percent of total Mine Site water releases. At the Tailings Basin, about 20 gallons per minute of untreated water would be released during closure (all related to Tailings Basin seepage that bypasses the groundwater containment system). This release represents less than one percent of total Tailings Basin water releases.

- *Water Flows*. The Final EIS does not predict any significant changes to groundwater and surface water flows.

- *Mercury.* The mass balance modeling and analog data from other natural lakes and mine pit lakes in northeastern Minnesota suggest that the mercury concentration in the West Pit Lake, which is the only surface water discharge at the Mine Site, would stabilize below the GLI standard of 1.3 ng/L at approximately 0.9 ng/L. The mercury concentration in seepage from the Tailings Basin is also anticipated to be below the GLI standard. The NorthMet Project Proposed Action is predicted to increase mercury loadings in the Embarrass River Watershed (still within standards) but decrease mercury loadings in the Partridge River.

- *Methylmercury*. There are several factors that appear to influence mercury methylation, including total available mercury, organic carbon, temperature, micronutrients required by sulfate-reducing bacteria, sulfate loadings, and certain hydrologic conditions. The proposed project is expected to have little or no effect on most of these factors with the exception of sulfate loadings and hydrologic conditions. The proposed project would have negligible effects on hydrologic changes in the Partridge and Embarrass Rivers, would maintain relatively low sulfate loadings to the Partridge River, and would reduce sulfate loadings to the Embarrass River. These changes in sulfate loadings and hydrologic conditions are not expected to promote mercury methylation.

- *Protected Areas*. Regarding potential impacts to the BWCAW and Voyageurs National Park watershed, no direct, indirect, or cumulative effect for surface water flow or surficial groundwater flow are predicted.

- *North Flow Path*. During development of the Final EIS the Co-lead Agencies became aware of a potential for a north flow path of bedrock groundwater from the NorthMet Mine site to the existing Northshore Mine when both facilities are in closure. After evaluating the available information the Co-lead Agencies determined that the possibility of a north flow path induced by future operations at the Northshore Mine Site is unlikely, but cannot be ruled out completely. Potential bedrock groundwater flow from the Mine Site north to the Northshore Mine is proposed to be addressed through monitoring and contingency mitigation if needed. Monitoring requirements would be implemented, and if the possibility of a north flow of bedrock groundwater is detected, it would be prevented by contingency mitigation measures.

Wetlands.

- *Direct Effects*. The proposed NorthMet Mining Project would directly affect 913.8 acres of wetlands located within the NorthMet Project area, mostly within the Mine Site. The wetlands at the Mine Site would be permanently lost.

- *Indirect Effects*. The acreage of wetlands in and around the project area that could be indirectly affected by the proposed NorthMet Mining Project varies depending on the method of calculation used. Up to 7,694.2 acres of wetlands could be indirectly affected based on the analog method of assessing indirect wetland impacts.

Vegetation.

- *Vegetative Cover*. The Final EIS projects disturbance of 2,189.7 acres of vegetative cover at the Plant Site and 1,718.6 acres of vegetative cover at the Mine Site.

- *Biodiversity Significance*. The Project could affect 1,718.6 acres of MBS Sites of High Biodiversity Significance, 698.2 acres of "imperiled-vulnerable" or "vulnerable" native plant communities, 92.6 acres of "apparently secure" native plant communities, and 178.9 acres of "widespread and secure" native plant communities.

- *Listed Species*. The Final EIS predicts direct effects to eight species of state-listed protected plants and indirect effects to two species.

Wildlife.

- *Canada Lynx*. The Canada lynx (federally listed) would likely be affected by localized direct decrease and fragmentation of critical habitat, and by the increased potential (albeit low) for incidental take resulting from vehicular collisions due to increased project-related traffic.

- *Gray Wolf*. The gray wolf (federally listed) would likely be affected through loss of habitat and the increased potential (albeit low) for incidental take resulting from vehicular collisions due to increased NorthMet Project Proposed Action-related traffic. The Gray Wolf was delisted in Minnesota on December 28, 2011. As a result of recent litigation in the D.C. District Court and resulting court order issued in December, 2014, the gray wolf was relisted as endangered within the project area on December 19, 2014. Issues associated with the potential taking of gray wolf critical habitat will be addressed through the ESA section 7 consultation process. 16 U.S.C. §1539.

- *Northern Long-Eared Bat*. The northern long-eared bat (federally listed) would likely be affected through loss of potential summer roost habitat and foraging areas.

- *State-Listed Species*. The Final EIS recognizes that as many as eight additional state-listed species, including the eastern heather vole, moose, little brown bat, eastern pipistrelle, northern goshawk, boreal owl, wood turtle, and yellow rail, could be affected.

Fish and Macroinvertebrates.

- *Habitat.* Water flows could be lower in several tributary streams to the Partridge and Embarrass rivers, but the flows would remain within the range of annual natural variability. Therefore, changes in flow are not anticipated to result in any measurable effects on existing aquatic habitat in any streams downstream of the NorthMet Project area.

- *Water Quality*. Although all solutes except aluminum are predicted to meet evaluation criteria or not cause or add to exceedances of evaluation criteria, the project would result in changes to water quality, primarily metals, and these changes have the potential to affect aquatic biota.

Air Quality.

- *Air Pollutants*. Criteria air pollutants would be generated during construction, mining, and processing activities, though they would be less than applicable Prevention of Significant Deterioration emissions threshold.

- *GHG.* Total direct GHG emissions would be less than 100,000 tons per year of CO2 and would not exceed the USEPA major source thresholds for GHGs.

- *Human Health*. Air pollutants with risk guideline value for assessing human health effects were all predicted to be at levels below state and federal risk guidelines.

- *Visibility.* The proposed project would not adversely affect visibility in nearby Class I areas, such as the BWCAW and Voyageurs National Park.

Cultural Resources.

- *No Adverse Effect*. There would be no adverse effect from the NorthMet Mining Project on the Erie Mining Company Railroad Mine and Plant Track, Main Line Segment, and Dunka Railroad Segment; Erie Mining Company Administration Building; and the DM & IR Segment.

- *Adverse Effect*. There would be adverse effects to the Partridge River Section of the *Mesabe Widjiu* (or Laurentian Divide), the Partridge River Segment of the Beaver Bay to Lake Vermilion Trail, Spring Mine Lake Sugarbush, Erie Mining Company Concentrator Building, and the Erie Mining Company Hoyt Lakes Operation Mining Landscape Historic District.

Socioeconomics.

- *Beneficial Effects*. The Project implementation would increase local employment and spending. Federal, state and local tax revenues would also increase.

Geotechnical Stability.

- *Factors of Safety*. Conceptual designs of the waste rock stockpiles, Tailings Basin, and Hydrometallurgical Residue Facility were developed and assessed through an iterative design and model process. These project features would meet Minnesota Dam Safety required factors of safety.

Cumulative Effects.

- *Additive Effects*. The Proposed Project would cause some additive effects on certain resources, such as loss of vegetation and wetlands in the project vicinity. There would be changes in water quality and use, air quality, and increased economic activity for the life of the mine.

- *Reduced Effects from the Project*. After the proposed mitigation and adaptive management measures are applied, the project's contribution to cumulative effects to water quantity and quality, air quality, wetlands, and vegetation would be reduced.

- *Listed Species*. No listed plant or animal species would be cumulatively affected.

ii. Land Exchange

The Final EIS discussion of impacts for the proposed Land Exchange, in terms of net changes to the federal estate that would occur as a result of the land exchange required for the project, is summarized by issue area below:

Land Use.

- *Federal Ownership*. The Proposed Project would result in a net increase to the federal estate of about 580 acres of publicly owned land in the 1854 Ceded Territory.

Water Resources.

- *Public Waters*. The Proposed Project would result in a net increase to the federal estate of about 95 acres of DNR-designated public water lakes (two miles of shoreline) and five miles of public water streams.

- *Wild Rice*. The proposal would increase the net acreage of wild rice beds in the federal estate. Hay Lake contains known wild rice beds (approximately 126 acres).

Wetlands.

- *Additional Acreage*. The Proposed Project would result in a net increase to the federal estate of about 506 acres of wetlands.

- *Floodplains*. The Proposed Project would increase net acreage in the federal estate by 376.2 acres of mapped floodplain area, and the project would decrease about 1,602.2 acres of unmapped floodplain area, for a net decrease of 1,226.0 acres of overall floodplain area within the federal estate. The Final EIS projects no increase in the flood damage potential associated with the Land Exchange Proposed Action.

- *Waterways*. The Proposed Project would provide for a net increase in waterway acreage and frontage within the federal estate.

Vegetation.

- *Cover Type*. The Proposed Project would yield a net increase to the federal estate of about 580 acres of vegetation land cover classification types.

- *Landscape*. Under the proposal, there would be a net increase to the federal estate of about 625 acres of landscape-scale ecosystem types.

- *Listed Species*. The 10 listed plant species at the Mine Site are not known to occur in the lands proposed for the exchange so they would be lost to the federal estate. The lands proposed for the exchange contain three different listed plant species so they would be added to the federal estate.

Wildlife.

- *Habitat*. The Proposed Project would result in a net increase to the federal estate of about 580 acres of vegetation land cover types for wildlife habitat.

- *Canada Lynx*. There would be mixed effects for the Canada lynx. It would increase the suitable habitat in the federal estate for lynx and for snowshoe hare (prey species). There would be a decrease in denning habitat and decrease of habitat within designated Lynx Analysis Units (LAUs). Designated critical lynx habitat would not change regardless of land ownership.

- *Gray Wolf*. The Final EIS anticipates a net increase to the federal estate of about 507 acres of forage habitat for the gray wolf and a net decrease of cover habitat for the wolf.

- *Northern Long-Eared Bat*. The Final EIS projects a net decrease to the federal estate in mature forest roosting habitat for northern long-eared bat and a net increase in brushland foraging habitat for the bat.

- *State Listed Species—Increase*. The document projects a net increase to the federal estate of number of occurrences or habitat availability for three state-listed species: the Eastern heather vole, the Laurentian tiger beetle, and the trumpeter swan.

- *State Listed Species—Decrease*. The Final EIS projects a net decrease to the federal estate of occurrences or habitat availability for four state-listed species: the little brown bat, the eastern pipistrelle, the northern goshawk, and the Quebec emerald butterfly.

- *State Listed Species—Unchanged*. No changes in the federal estate for occurrences or habitat availability would be expected for seven additional state-listed species: moose; boreal owl; wood turtle; the yellow rail; and the taiga alpine, Freiza's grizzled skipper, and Nabokov's blue butterflies.

Aquatic Species.

- *Connectivity*. Watershed riparian connectivity and aquatic connectivity would increase within the federal estate.

- *Fish*. The Final EIS anticipates potential increase for nine additional fish species within the federal estate.

- *SGCN Species*. The Final EIS projects potential increase to the federal estate of six new potential aquatic Species of Greatest Conservation Need (SGCN).

Socioeconomics.

- *Economic Effects*. The Proposed Project would have moderate positive economic effects through increased opportunity for forestry and recreation and associated employment, earnings, and revenue.

- *Environmental Justice*. Effects on populations and subsistence activities are difficult to determine. There would be a loss of subsistence resources and opportunities on the current federal lands. These loses would be offset by an increase in subsistence resource and opportunities on what are currently non-federal lands that would be transferred to federal ownership.

Recreation and Visual Resources.

- *Recreational Opportunities*. There would be a net increase in opportunities for recreational activity within the federal estate.

- *Scenic Integrity*. The Proposed Project would result in a net increase in the amount of land controlled by the USFS in the Superior National Forest with Moderate and High Scenic Integrity Objectives.

Wilderness and Other Special Designation Areas.

- *Wilderness Designation*. No net increase or decrease in any wilderness areas would be anticipated.

- *cRNAs*. The Proposed Project would result in a net increase of about 307 acres of candidate Research Natural Areas (cRNAs) for the federal estate.

iii. Land Exchange Alternative B

The Final EIS discussion of impacts for the Land Exchange Alternative B indicates that this alternative would have generally the same effects as the proposed connected actions (NorthMet Mining Project and Land Exchange), but fewer lands would be conveyed through the land exchange. Alternative B would result in a net increase of wetlands to the federal estate, a net increase of mapped floodplains but a net decrease of floodplains to the federal estate, a net increase of vegetation land cover types for wildlife habitat to the federal estate, and the remaining federal lands at the Mine Site would not have public access.

iv. No Action Alternative

The Final EIS discussion of impacts for the No Action Alternative indicates this alternative would avoid the environmental and social impacts associated with the NorthMet Mining Project and Land Exchange. The social and economic benefits from the proposed project, in the form of increased employment and economic revenue, would not occur. Lands proposed for exchange would remain in the federal estate.

7. 2015 Final EIS—Mitigation Measures

164. The Final EIS identifies those mitigation measures that could reasonably eliminate, minimize or compensate for adverse environmental, economic, employment, or sociological effects of the proposed project. *See* Minn. R. 4410.2300, item I.

165. The specific mitigation measures identified for water resources included, but are not limited to:

Fixed Engineering Controls. The Proposer proposed fixed engineering controls that would decrease effects on water resources. These fixed engineering controls are not expected to be modified during the life of the NorthMet Project and would also be addressed as permit conditions and as part of the financial assurance package. The fixed engineering controls include the following:

- *Stormwater control.* Mine perimeter and pit rim ditches and sedimentation basins would be employed to separate and control stormwater and process waters. Pipes, pumps, and lined process water ponds would be used to separate and control stormwater and process waters. Haul roads would be designed and constructed to collect and separate stormwater from road surfaces.

- *Temporary Storage.* Geomembrane liners, underdrain systems, sumps, and overflow ponds would be required for temporary storage of Category 2/3, Category 4 and Ore Surge Pile rock.

- *Water Seepage.* Category 1 Stockpile hydraulic barrier and drain pipe to collect surface and groundwater seepage that would then be pumped to the Waste Water Treatment Facility ("WWTF"), enabling the capture and treatment of nearly all Category 1 Stockpile seepage. Tailings Basin containment system to collect surface and groundwater seepage on the western, northwestern northern, eastern and southern sides of the Tailings Basin and pump it back to the Tailings Basin pond or to the Plant Site Waste Water Treatment Plant ("WWTP").

- *Reuse of Water.* Treated Water Pipeline and Central Pumping Station to allow the re-use of wastewater at the processing plant and to assure a zero liquid discharge during operations at the Mine Site. The Tailings Basin will be designed to collect and control NorthMet tailings and reuse of process water.

- *Reduction of Water and Oxygen Intrusion.* Bentonite-amended tailings basin beaches and bottom (during reclamation) and embankment face (during operations) would be employed to reduce both water and oxygen intrusion into the tailings during reclamation.

- *Control of Hydrometallurgical Residue.* Hydrometallurgical Residue Facility would be employed to collect, control, and store hydrometallurgical residue and for reuse and recycling of process water. This facility would include a double geomembrane liner with a leakage collection system that would return any leachate to the Hydrometallurgical Residue Facility pond.

- *Control of Water Flows.* A Tailings Basin tributary augmentation system would be employed to maintain flows within ± 20 percent of existing flows using WWTP effluent.

Adaptive Engineering Controls. Adaptive engineering controls would be implemented as needed. The determination of need would be based on actual water quality conditions encountered during the phases of the Project or conditions on site. The conditions on site would be regularly analyzed by ongoing water quality monitoring. Data gathered from this monitoring would be regularly used to update water models on an ongoing basis. These modeling updates would be used to determine when and how to launch Adaptive engineering controls. Adaptive engineering controls would be included as part of the Permit to Mine financial assurance package and included the following:

- *Mine Site WWTF.* The WWTF would be upgraded to a reverse osmosis ("RO") process or equivalently performing technology that would meet water quality targets during closure and long-term maintenance to manage sulfate concentrations. The WWTF's operating configuration, process unit requirements and capacity could be modified to treat varying influent streams and discharge requirements. Lime could also be added to the East Pit during waste rock backfilling if additional alkalinity were needed.

- *Adaptive Management Strategies.* Adaptive management strategies for total mercury include pretreatment modifications such as use of a chemical scavenger addition ahead of the greensand filter units to obtain additional metals, the use of tighter RO membranes for the primary RO system, treatment of some portion of the Vibratory Shear Enhanced Process ("VSEP") permeate by the primary RO system to further remove some dissolved constituents, and addition of polishing treatment units for removal of trace metals (e.g., ion exchange).

- *Adaptive Mitigation Measures.* Adaptive mitigation measures would be implemented to decrease the Project's effects on the Partridge River prior to an actual effect if future monitoring and modeling, predict that the Proposed Project would not protect surface waters. Possible adaptive measures that could be implemented included:

    - Modifying the WWTF design to generate cleaner effluent.
    - Increasing the volume of WWTF discharge in closure. The Proposer could temporarily increase the volume of treated water from the WWTF during low-flow conditions, to dilute pollutant concentrations in the Partridge River.

- *Category 1 Stockpile Cover System*. The design of the Category 1 Stockpile cover system could be modified to mitigate newly discovered issues up to the point of construction. Adaptations to the Cover System could include:

    - An increase or decrease in thickness of the geomembrane material to modify the potential for defects created during installation and to extend the life of the geomembrane.
    - An increase or decrease in the soil cover thickness above the geomembrane material to modify water storage capacity.
    - An increase or decrease in the soil hydraulic conductivity of the granular drainage layer above the geomembrane to modify lateral drainage capacity.
    - An increase or decrease of uninterrupted slope length to modify lateral drainage capacity.
    - A Modification of soil type and/or thickness below the geomembrane to modify leakage rate through potential geomembrane defects.
    - Incorporation of a geosynthetic clay liner below the geomembrane to modify leakage rate through potential geomembrane defects.
    - Post-installation adjustments, such as modifying vegetation density and erosion of the cover system once the cover system has been installed.

- *Plant Site WWTP*. Adaptations in construction phases and in operating conditions can be made:

    - The WWTP is currently planned to be constructed in a phased build-out base on the capacity needed to meet maximum flow conditions. Therefore actual variations in the quantity of flow can easily be addressed by either accelerating or delaying the installation of the additional equipment planned for the phased expansion of the WWTP.
    - Treatment performance issues that could occur from changes in influent water quality can be addressed by making adjustments to operating conditions. It is expected that, at various times throughout the year, the WWTP would have excess hydraulic capacity, which could be used to improve water treatment performance. This would enable the WWTP to be used to reduce the recovery rates for the membrane separation processes

or increase the hydraulic retention times in the chemical precipitation processes. Additional Adaptive Strategies. Other adaptations to modify treatment performance include:

- Selection of alternative membranes for either the RO or the Vibratory Shear Enhanced Processing (VSEP) process units to modify the removal efficiencies of some parameters across treatment systems.
- That addition of chemicals to increase metals removal by the WWTP.
- Softening pretreatment.

- *Adaptive Management Strategies.* Adaptive management strategies for total mercury include pretreatment modifications such as the addition of a chemical scavenger to capture additional metals; the use of tighter RO membranes for the primary RO system; treatment of some portion of the VSEP permeate by the primary RO system to further remove some dissolved constituents; and addition of polishing treatment units for removal of trace metals (e.g., ion exchange).

- *Tailings Basin Pond Bottom Cover*. During reclamation, the Proposer intends to deposit granular or pelletized bentonite into the Tailings Basin pond, which would then settle and form a cover.
  - The Tailings Basin pond bottom cover thickness or the percent of bentonite in the pellets or grains or both could be changed if monitored water quantity or quality suggests that modifications were needed to meet water resource objectives. This modification could occur before or after installation of the cover to improve performance.
  - The bentonite-amended layer could also be excavated from portions of the pond bottom to modify performance.

Contingency Mitigation. Contingency mitigation measures are technically feasible options that could be undertaken should engineering controls (fixed or adaptive) be unable to ensure compliance with applicable water quality standards. If monitoring or refined modeling were to indicate that contingency mitigation would be needed, these measures would be employed as appropriate and approved. Contingency mitigation measures that could be employed to respond to or mitigate the following situations include:

- *Additional Capacity.*

  Issue: A pattern of overflows of the process water sumps or ponds develops.

  Contingency Mitigation: In all the process water sumps and ponds, there would be excess capacity designed as a safety factor ranging from approximately 30 to 270 percent of required capacity. Additional capacity could be developed by expanding the pond areas.

- *Catchment Areas.*

Issue: Streams along the railroad corridor between the Mine Site and Plant Site show degradation in water quality as a result of material spilled from the rail cars.
Contingency Mitigation: Catchment areas could be developed adjacent to the tracks at stream crossings to minimize the amount of material that reaches the streams.

- *Interception Wells.*

  Issue: Groundwater downgradient of lined infrastructure had compliance issues.
  Contingency Mitigation: Interception wells could collect groundwater flows affected by a leak from one of the liner systems or by the Overburden and Storage Laydown Area (OSLA). Interception wells would only be needed while groundwater was affected by the temporary mine features.

- *Treatment of West Pit Water.*

  Issue: West Pit water quality is not as expected.
  Contingency Mitigation: This could be addressed by reducing the contaminant load from the West Pit walls or the East Pit using methods such as low permeability soil barriers or a permeable reactive barrier to treat discharge. Other measure include adding water with lower concentrations of contaminants to the West Pit by routing additional stormwater to the West Pit, or treating the West Pit either by pumping West Pit water to the WWTF for treatment or by treating the West Pit Lake *in situ* with iron salts, fertilizer, or other methods tailored to the contaminant.

- *Grout Curtain.*

  Issue: East Pit or West Pit groundwater inflows are greater than expected due to bedrocks faults.
  Contingency Mitigation: Use of a grout curtain to control groundwater flow into pits and eventually out of pits when they are filled with water or water and rock. This measure could be implemented depending on additional evaluation with the benefit of an understanding of contemporaneous conditions.

- *Expansion of Seepage Management System.*

  Issue: New surface seepage locations emerge as the Tailings Basin develops.
  Contingency Mitigation: The surface and groundwater seepage containment system or the existing Tailings Basin south surface seepage management system could be expanded to collect seepage from any new seepage locations.

- *Improving Tailing Basin Pond Water Quality.*

  Issue: Tailings Basin pond water quality is worse than expected.
  Contingency Mitigation: There are several methods that could be used to address this issue, including:

  - Reduce solute load delivered to the Tailings Basin pond by incorporating additional treatment at the Mine Site WWTF.

- Send all or a portion of the water from the surface and groundwater seepage containment system and Tailings Basin south surface seepage management systems to the WWTP for treatment before returning it to the Tailings Basin pond.
- Send pond water to the WWTP for treatment before returning it to the Tailings Basin pond.
- Treating the Tailings Basin pond *in situ* with iron salts, fertilizer, or other methods tailored to the constituent of concern.

- *Improving Groundwater and Surface Water Quality.*

  Issue: Groundwater or surface water downgradient of the Tailings Basin has compliance issues.

  Contingency Mitigation: There are several methods that could be employed to address this issue including inspecting the containment system around the Tailings Basin for breaches and repair, by using interception wells to collect groundwater flows affected by a breach, or by improving Tailings Basin pond water quality (see above).

- *Bedrock Northward Flow*.

  Issue: Preventing a northward flow of pit water from the proposed NorthMet pits to the Northshore Mine pits.

  Contingency Mitigation: Mitigation measures to address this issue will come into play at closure. To assure that adequate information is available to address this contingency the Final EIS recommends that extensive data is collected and analyzed. Data should be collected and analyzed immediately and continue through the life of the Project. If needed, an effective engineering design could be selected to prevent any adverse impact that might be anticipated should the data suggest the potential for adverse impact at closure. The mitigation measures below could be implemented, either individually or in combination with one another, to prevent any potential adverse impact. The performance of any implemented mitigation measures would be determined by monitoring the direction of groundwater flow. The exact type, location, scale, and timing of mitigation measures cannot be known at this time. If they are needed, the mitigation measures would be required to be maintained indefinitely or until acceptable groundwater flow conditions are obtained without those measures.

  - Grouting: Industrial mining grout (commonly a mixture of bentonite, cement, and water) injection can be used to reduce the hydraulic conductivity of the fractures/faults network, thus controling bedrock groundwater flow between the mine pits. Grout curtains are a series of closely spaced drilled holes from which grout is injected into fractures, which can be used for groundwater control in both unconsolidated deposits and fractured rock.
  - Pit Lake Depression: Water levels could be managed in the NorthMet East and/or West pits so that they are equal to or lower than the Northshore Mine pits. In this instance the hydraulic heads between the mines would be reduced and the potential for northward bedrock flow is either avoided entirely, or there is sufficient reduction in the head that this strategy in conjunction with other mitigation measures could prevent the

flow. Implementation of this measure would create additional challenges for water treatment, water management and reclamation.

- Groundwater Extraction Wells: Using extraction wells, the Proposer could pump water from bedrock north of the NorthMet Mine Site to create a hydraulic depression in the bedrock groundwater system between the NorthMet and Northshore mines.
- Artificial Recharge: A bedrock groundwater mound can be artificially created between the NorthMet mine and the Northshore Mine by using bedrock wells or an infiltration trench or a combination of the two to increase aquifer recharge.

166. The specific mitigation measures for wetlands include, but are not limited to:

- *Wetlands Mitigation Strategy*. The overall wetland mitigation strategy for the NorthMet Project Proposed Action is to compensate for unavoidable wetland impacts in-place, in-kind where possible and in advance of impacts when feasible in order to replace lost wetland functions. The number of mitigation credits to be earned by replacement wetlands would be determined during permitting by the USACE and by the DNR as part of the permit to mine as required by Minn. Stat. §§ 103G.222, 103G.2243, and 93.481.

    - Compensatory mitigation is required for the 913.8 acres of wetlands that would be directly impacted. Depending on the location, type, and timing of compensatory mitigation, the minimum requirement for replacement wetlands for direct effects could potentially range from 913.8 acres up to 1,827.6 acres (i.e., compensation ratios of 1:1 up to 2:1).
    - Compensatory mitigation for the 26.9 acres of wetland fragmentation would be provided at the beginning of Project operations.

- *Off-site Wetland Mitigation.* Off-site wetland mitigation projects would be implemented to complete the requirements for compensatory mitigation:

    - Aitkin Site – 808.3 acres of wetland restoration and 83.2 acres of upland buffer;
    - Hinckley Site – 286.2 acres of wetland restoration and 91.2 acres of upland buffer; and
    - Zim Site – 508.2 acres of wetland restoration and 22.7 acres of upland buffer.

- *Establishment of Wetlands.* Establishment of approximately 101.8 acres of wetlands would likely occur during reclamation of the Mine Site; this new wetland area would not be included in the mitigation credits that would be considered during permitting.

- *Compensation Ratios.* Neither the USACE St. Paul District nor the state have made a final determination of the compensation ratios that would be required for the Project. Base compensation ratios for USACE would be either 2:1 or 1.5:1 and for the state 1.5:1 or 1:1 depending on the location, quality of the wetland, wetland type, and timeframe of the

compensation. The final decision on compensatory mitigation ratios would be determined during permitting.

- *Financial Assurances.* Financial assurances for the direct wetland impact mitigation would be required until success of the mitigation sites is assured.

- *Off-site Restoration Areas.* In general, off-site wetland restoration areas would be monitored for up to 20 years beginning in the first full growing season after completing hydrologic restoration and ending upon certification by the USACE and DNR that the wetlands have met performance standards.

- *Permitting.* Wetlands that are not filled or excavated (permanently lost), but that do have a reduced function, would be considered indirectly affected. Wetland mitigation for potential indirect wetland effects would be determined by the agencies during permitting. If the NorthMet Project Proposed Action were to be permitted, mitigation for indirectly affected wetlands would be determined through monitoring. Additional compensation would be required if determined necessary based on monitoring results.

167. The specific mitigation measures identified for vegetation include, but are not limited to:

- *Reclamation.* Impacts to vegetation would be mitigated through site reclamation. Disturbed areas would be reclaimed during operations and at closure. Reclamation objectives would include rapidly establishing a self-sustaining plant community, controlling air emissions, controlling soil erosion, providing wildlife habitat, and minimizing the need for maintenance. Seed mixes and methodologies would be designed to minimize the introduction of invasive species. Reclamation seed mixes would be approved during permitting.

- *Additional Mine Site Mitigation Measures*:

    - Reseeding with native species, provided they can perform as effectively as the non-native species.
    - Reseeding with non-native species if needed in areas where erosion control would be critical to prevent slope failures.
    - Temporary stabilization efforts using non-native species should use non-invasive plant species to minimize the long-term risk to surrounding plant communities. In the event invasive non-native species are introduced, an additional mitigation measure would be to implement a monitoring and control program for invasive species (including noxious weeds) to ensure these species do not overtake surrounding native communities.
    - Purchase of an unprotected site with a population of *Caltha natans* should be assessed as mitigation, since the statewide population is lower than the other endangered, threatened or special concern (ETSC) species affected.

- *Additional Plant Site Mitigation Measures*:

- Reseeding with native species, provided they can perform as effectively as the non-native species.
- Reseeding with non-native species if needed in areas where erosion control would be critical to prevent slope failures.
- To minimize the long-term risk to surrounding plant communities only non-invasive plant species should be used where temporary stabilization efforts allow using non-native species. In the event invasive non-native species are introduced, additional mitigation measures would be necessary. These measures include the adoption of a monitoring and control program for invasive species (including noxious weeds) to ensure these species do not overtake surrounding native communities.
- Addition of organic amendments (peat) to the top foot of the Tailings Basin to improve soil and water quality and promote the development of shoreline and near-shore wetland vegetation.

168. The specific mitigation measures identified to address air quality impacts, including greenhouse gases, include but are not limited to:

- *Hydrometallurgical Process.* Use of hydrometallurgical process, rather than a pyrometallurgical process. The hydrometallurgical process is expected to reduce the project's energy demand by 50 percent over comparable pyrometallurgical processes.

- *Efficient Motors.* Use of premium efficiency motors in selected locations rather than standard motors.

- *Gravity Transport.* Use of gravity transport of process slurries where possible, instead of pumps.

- *Minimize Electricity Consumption.* Configure the processing plant so that the overall power factor for the facility is as close to one (energy input to energy output) as practical, to help minimize electricity use.

- *Electric Power.* Primary production excavators and two of the three blast-hole drills would be electric rather than diesel powered, eliminating a direct source of GHG emissions.

- *New Locomotives.* Purchase and use new "gen-set" locomotives, which are more efficient and use less fuel than conventional locomotives.

- *Natural Gas.* Use natural gas heaters for space heating in the former LTVSMC processing plant. Per unit of useful energy, the combustion of natural gas results in lower carbon dioxide (CO2e) emissions than does the combustion of other fuels. Of the three feasible space heating options, electric heating, propane-fired heating, and natural gas-fired heating, natural gas-fired heating would result in aggregate in CO2 emissions that would be about 80 percent lower than those for electric heating and 66 percent lower than those for propane-fired heaters.

- *Compensatory Wetland Mitigation.* To mitigate GHG effects associated with a change in existing land cover (i.e., secondary effects), the Proposer would provide compensatory wetland mitigation for both direct effects on wetlands as well as for indirect effects on fragmented wetlands.

- *Anti-Idle.* Voluntary anti-idle program to reduce nitrous oxide (NOx) and sulfur dioxide (SO_2) emissions, as well as particulate matter (PM) and GHG.

- *Rail Car Ore Transport Fugitive Dust Mitigation Measures*:

    - Rail cars designed to centralize the ore fines to the central portion of the rail car to minimize the potential for spillage during transport.
    - Mine Site Fugitive Emission Control Plan includes minimizing the drop distance of the ore into the railcars, reporting dusty conditions during loading and transport, and conducting one observation per train to evaluate rail car loading conditions.
    - Annual training for all locomotive workers on methods to minimize fugitive dust during ore transport and loading.

169. The specific mitigation measures identified for geotechnical stability include, but are not limited to:

General Design. Preliminary designs of the waste rock stockpiles, Tailings Basin, and Hydrometallurgical Residue Facility were developed and shown by the Proposer, through an iterative design and modeling process, to meet required factors of safety and water quality evaluation criteria. The slope stability and liner integrity of these facilities would be monitored throughout operations and long-term closure. This approach would allow for identification of a need to implement adaptive mitigation measures such as slope modification, additional rock buttressing, and/or improving water management performance should the facilities perform differently from their design.

Waste rock stockpiles. Measures to address waste rock stockpile geotechnical stability include:

- *Ground and Surface Water Containment System.* A surface water and groundwater containment system encompassing the permanent waste rock stockpile for Category 1 waste rock to capture ground and surface water flows that may seep from the stockpile.

- *Geomembrane Cover System.* An engineered geomembrane cover system at closure for the permanent waste rock stockpile for Category 1 waste rock.

- *Composite Geomembrane Liner Systems*. Composite geomembrane liner systems for the temporary stockpiles for Category 4 waste rock, the combined Category 2/3 waste rock, and the ore surge pile. The liner systems would be composed of a foundation underdrain system, an impermeable composite liner barrier, and an overliner drainage layer.

- *Backfilling Waste Rock.* Backfilling Category 2/3 and Category 4 waste rock into the East Pit following year 11 of the project.

- *Monitoring Stockpile.* Monitoring and maintenance of the Category 1 Stockpile continuing through the postclosure period until the DNR determines that the cover is stable.

- *Adaptive Waste Management.* Ongoing monitoring would also be used to advise adaptive waste management requirements should the capacity of the Category 2/3 Stockpile, the Category 4 Stockpile, and/or the East Pit be insufficient for the mined volume of Category 2/3 and Category 4 waste rock generated by mining. Adaptive waste rock management could include expansion of the waste rock stockpiles. While moving all of the Category 1 waste rock into the West Pit as backfill was eliminated as a potential alternative, it may be possible to dispose of some excess waste rock or saturated overburden in the West Pit in areas where mining has ceased, if necessary as an adaptive measure.

Tailings Basin. Measures to address Tailings Basin geotechnical stability include:

- *Buttress.* Rock buttressing to meet the required factory of safety.

- *Cement Deep Soil Mixing.* Cementing deep soil mixing on north side of tailings basin to meet the required factory of safety.

- *Upkeep.* Repairing eroded surfaces and repair and/or replacement of damaged monitoring and operational infrastructure.

- *Modifications.* Where monitoring or model updates indicate that the factor of safety for the Tailings Basin may no longer meet design criteria, appropriate modifications to the Tailings Basin would be considered, modeled, and, if necessary, undertaken. Modifications could include, but are not limited to, modification of bench widths between lifts of the dam, modification of lift heights, and modification of slope angles. Other modifications could include increasing the size of the rock buttress, improving the performance of underdrains, and increasing mid-slope setbacks.

- *Contingency Plan*. A Contingency Action Plan has been prepared as part of the Flotation Tailings Management Plan to provide guidance to on-site personnel and emergency responders in the case of unplanned occurrences at the Tailings Basin.

- *Long-Term Maintenance.* Long-term maintenance tasks at the Tailings Basin would include:

    - Annual inspection of vegetation on the exterior dam faces and interior beaches, with erosion repaired and vegetation reseeded in accordance with requirements of plans as needed until released from these activities by the DNR.
    - Snow removal from the dam crest to allow access during winter months.
    - Reconstruction of eroded dam crest, slope or toe.

- Mulching for fugitive dust control in accordance with requirements of plans.
- Repair and/or replacement of damaged instrumentation and monitoring.

- *Mitigation Measures in Closure,* would include:

  - Bentonite augmentation of the pond area bottom to reduce infiltration to a sufficient degree to maintain desired pond water elevations at closure.
  - Slight slope grading of the interior portions for effective storm water routing into the pond area.
  - Bentonite augmentation of the exposed embankments and beach areas.
  - Mulching and planting/seeding of native vegetation of upland areas (plants would be selected and monitored to limit root growth from penetrating bentonite).

Hydrometallurgical Residue Facility. Measures to address Hydrometallurgical Residue Facility geotechnical stability include:

- *Preconstruction Design Considerations for Stability*:

  - Install a granular drainage layer at the existing LTVSMC Emergency Basin, as needed to facilitate wick drain installation and operation.
  - Install wick drains (if required).
  - Place, monitor, and remove a preload fill in the existing LTVSMC Emergency Basin to pre-consolidate existing material, thereby reducing future anticipated settlements to mitigate the potential future strains.
  - A railroad grade would also be abandoned and removed to facilitate construction.
  - A collection drain that would collect water from the seep below the proposed constructed embankment and liner systems to transmit the collected seep to the exterior of the facility.

- *Liner and Collection System*. Installation of a double liner and collection system with the following components: upper geomembrane; geocomposite (geonet) (for leakage collection and recovery); lower geomembrane; and geosynthetic clay liner.

- *During Reclamation*. Reclamation of the Hydrometallurgical Residue Facility would include removal of ponded water, removal of pore water from the residue, construction of the cover system, and establishment of vegetation and surface water runoff controls. Turf and final cover would be inspected and maintained by mowing once per year or as needed, fertilizing when visual inspection indicates poor vegetation growth, and implementing repairs. A Contingency Action Plan has been prepared as part of the Residue Management Plan to provide guidance to on-site personnel and emergency responders in the case of unplanned occurrences at the Hydrometallurgical Residue Facility.

8. 2015 Final EIS—Major Differences of Opinion and Point of View

170. The Final EIS identified and disclosed major differences of opinion and points of view on the impacts of the alternatives, including the proposed project, with the Tribal Cooperating Agencies in Final EIS Chapter 8 and Appendix C. Similarly, individual responses provided in Appendix A of the Final EIS offer major differences of opinion and points of view of the Tribal Cooperating Agencies, including the DNR, USACE, and USFS responses to these comments. *See* Minn. R. 4410.2300, item H. *See* 40 CFR §1502.9(a).

171. The Final EIS also identified and disclosed major differences of opinion and points of view on the impacts of the alternatives, including the proposed project, from public comments on the Draft EIS and Supplemental Draft EIS in Appendix A. The Co-lead Agencies provide responses to these comments. *See* Minn. R. 4410.2300, item H.

9. 2015 Final EIS—Public Review and Comment

172. Under Minnesota law, the public comment period on a Final EIS is ten days. DNR expanded the comment period on the Final EIS to 30 days from publication of the *Federal Register* Notice of Final EIS Availability. The effective comment period for the Final EIS began on November 6, 2015 and ended on December 21, 2015. *See* Minn. R. 4410.2800, subp. 2. *See* 40 CFR §1503.4(b).

173. The copy of the Final EIS provided on November 2, 2015, to the EQB staff served as notification to publish notice of availability of the Final EIS in the EQB *Monitor*. *See* Minn. R. 4410.2700, subp. 4.

174. On November 6, 2015, DNR distributed the Final EIS to all governmental units with authority to permit or approve the proposed project, to the Proposer, to all parties on the EQB's Draft EIS distribution list, to all parties who submitted substantive comments during EIS scoping, the Draft EIS, Supplemental Draft EIS, and to all parties who requested a copy. *See* Minn. R. 4410.2700, subp. 3.

175. An Executive Summary of the Final EIS was supplied to all persons who submitted substantive comments on the Scoping EAW, Draft Scope, Draft EIS, Supplemental Draft EIS, and to any person requesting the Executive Summary. *See* Minn. R. 4410.2700, subp. 4.

176. A notice of availability of the Final EIS was published in the November 9, 2015 edition of the EQB *Monitor* (Vol. 39, No. 23). *See* Minn. R. 4410.2700, subp. 4.

177. The EQB *Monitor* notice included the public locations where copies of the Final EIS were available for public review, and indicated the comment period closure date and time (December 14, 2015, 2014, at 4:30 PM). *See* Minn. R. 4410.2700, subp. 6.

178. The DNR issued a statewide press release on November 6, 2015, which was sent to numerous news outlets including at least one newspaper of general circulation in the vicinity of the Project. The press release included notice of the public locations where the copies of the Final EIS were available for public review and indicated the comment closure date and time (December 14, 2015, at 4:30 PM). *See* Minn. R. 4410.2700, subp. 5.

179. The USACE and USFS issued a Notice of Final EIS Availability in the November 13, 2015, *Federal Register* (Vol. 80, No. 219) indicating the Final EIS review period would end on December 14, 2015. A minimum of 30 days must pass after the close of the review period before a federal lead agency can make a decision on its proposed action unless the agency couples the 30 day waiting period with a formal internal appeals process. *See* 40 CFR §1506.10.

180. The Final EIS incorporated material by reference to reduce the bulk of the document without impeding governmental and public review of the project. All material incorporated by reference was made available for inspection by interested persons within the time allowed for comment. *See* Minn. R. 4410.2400.

181. On November 24, 2015, the DNR, USACE, and USFS prepared an *errata* regarding reference-related corrections to the Final EIS. The Co-lead Agencies distributed the errata to the Final EIS to all governmental units with authority to permit or approve the proposed project, to the Proposer, to all parties on the EQB's Draft EIS distribution list, to all parties who submitted substantive comments during EIS scoping, the Draft EIS, the Supplemental Draft EIS, and to all parties who requested a copy.

182. On December 10, 2015, DNR elected to extend the comment period for EIS adequacy from 4:30 PM on December 14, 2015, to 4:30 PM on December 21, 2015 and issued a press release announcing the extension. The DNR press release was sent to numerous news organizations including at least one newspaper of general circulation in the vicinity of the Project. The press release included notice of the public locations where the copies of the Final EIS were available for public review and indicated the comment closure date and time (December 21, 2015, at 4:30 PM). See Minn. R. 4410.2700, subp. 5

183. On December 11, 2015, DNR provided notice of an extension of the comment period to all governmental units with authority to permit or approve the proposed project, to the Project Proposer, to all parties on the EQB's Draft EIS distribution list, all parties who submitted substantive comments during EIS scoping, the Draft EIS, Supplemental Draft EIS, and to all parties who requested a copy. *See* Minn. R. 4410.2700, subp. 3.

184. The public comment period on the Final EIS ended on December 21, 2015, at 4:30 PM, which was not less than ten days following the publication of the EQB *Monitor* of the notice of availability of the Final EIS. The public comment period ended forty-two days following the notice of availability in the EQB *Monitor. See* Minn. R. 4410.2800, subp. 2.

185. The Co-lead Agencies received 30,539 submissions during the public comment period on the adequacy of the Final EIS.

F. 2016 Determination of Adequacy

186. As described above, the Final EIS provided an overview and described the purpose and need of the NorthMet Proposed Action and the Land Exchange; the process undertaken by the Co-lead Agencies in preparing the EIS; a description of the proposed alternatives; an evaluation of the existing

conditions, as well as the potential direct, indirect, and cumulative effects of the proposed project; and the Tribal Cooperating Agencies' major differences of opinion.

187. To determine that a Final EIS is adequate the DNR, as RGU, must find that the Final EIS: a) addresses the potentially significant issues and alternatives raised in scoping so that all significant issues for which information can reasonably be obtained have been analyzed in conformance with Minnesota Rules, part 4410.2300, items G and H; b) provides responses to the substantive comments received during the draft EIS (and supplemental draft EIS) review concerning issues raised in scoping; and c) was prepared in compliance with the procedures of MEPA and the EQB Rules, parts 4410.0200 to 4410.6500. *See* Minn. R. 4410.2800, subpart 4.

1. 2015 Final EIS—Application of the Adequacy Criteria

188. A detailed analysis of how the final EIS addresses potentially significant issues and alternatives raised during scoping and for which information can reasonably be obtained as required by Minnesota Rules, part 4410.2300, items G and H, is set forth in Finding of Facts paragraphs 189 through 221. The required components *per se* are taken from the Final Scope identified in Finding of Fact paragraph 74, with each requirement underlined at the beginning of each finding.

i. Did the 2015 Final EIS Address the Potentially Significant Issues and Alternatives Raised in Scoping?

189. Final Scope Section 2.1 – Proposed Alternative. The NorthMet Mining Project proposed action is described in Final EIS Section 3.2.2. The Land Exchange proposed action is described in Final EIS Section 3.3.2. Socio-economic effects are addressed in Final EIS Section 4.2.10, Section 4.3.10, Section 5.2.10, Section 5.3.10, Section 6.2.10, and Section 6.3.10.

190. Final Scope Section 2.2 – No Action Alternative. The NorthMet Mining Project no action alternative is described in Final EIS Section 3.2.3.2. The Land Exchange no action alternative is described in Final EIS Section 3.3.3.1. Socio-economic effects are addressed in Final EIS Section 4.2.10, Section 4.3.10, Section 5.2.10, Section 5.3.10, Section 6.2.10, and Section 6.3.10.

191. Final Scope Section 2.3 – Site Alternatives. The consideration of site alternatives for the NorthMet Mining Project is described in Final EIS Section 3.2.3.3 and Section 3.2.3.4. The consideration of site alternatives for the Land Exchange is described in Final EIS Section 3.3.3.

192. Final Scope Section 2.4 – Technology Alternatives. The consideration of technology alternatives for the NorthMet Mining Project is described in Final EIS Section 3.2.3.3.2, Section 3.2.3.4, and Section 3.2.3.4.1. The consideration of technology alternatives analogous for the Land Exchange is described in Final EIS Section 3.3.3.3.6.

193. Final Scope Section 2.5 – Modified Designs or Layouts. The consideration of modified designs or layouts alternatives for the NorthMet Mining Project is described in Final EIS Section 3.2.3.3.1, Section 3.2.3.3.2, and Section 3.2.3.4. The consideration of analogous modified designs or layouts alternatives for the Land Exchange is described in Final EIS Section 3.3.3.2 and Section 3.3.3.3.

194. Final Scope Section 2.7 – Incorporation of Mitigation Measures Identified Through Public Comments. The consideration of mitigation measures identified through public comments for the NorthMet Mining Project is described in Final EIS Section 3.2.3.4 and Section 3.2.3.6.

195. Final Scope Section 3.1 – EIS Issues / Land Use. The issue of land use is described in Final EIS Section 4.2.1, Section 4.3.1, Section 5.2.1, Section 5.3.1, Section 6.2.1, and Section 6.3.1. The Final EIS's treatment of land use is expanded beyond that proposed under the Final Scope.

196. Final Scope Section 3.1 – EIS Issues / Water-related Land Use Management District. The issue of water-related land use management district is the same as determined in the Final Scope. Treatment of the topic was not developed beyond the information analyzed in the Scoping EAW.

197. Final Scope Section 3.1 – EIS Issues / Water Surface Use. The issue of water surface use is the same as determined in the Final Scope. The treatment of the topic was not developed beyond the information analyzed in the Scoping EAW.

198. Final Scope Section 3.1 – EIS Issues / Geologic Hazards and Soil Conditions. The issue of geologic hazards and soil conditions is the same as determined in the Final Scope. The treatment of the topic was not developed beyond the information analyzed in the Scoping EAW.

199. Final Scope Section 3.1 – EIS Issues / Traffic. This issue of traffic is the same as determined in the Final Scope. The treatment of the topic was not developed beyond the information analyzed in the Scoping EAW.

200. Final Scope Section 3.2.1 – EIS Issues / Cover Types. The issue of cover types is described in Final EIS Section 4.2.3, Section 4.2.4, Section 5.2.3, Section 5.2.4, Section 6.2.3, Section 6.2.4, Section 6.3.3, and Section 6.3.4.

201. Final Scope Section 3.2.2 – EIS Issues / Vehicle Related Air Emissions. The issue of vehicle related air emissions is addressed in Final EIS Section 4.2.7 and Section 5.2.7.

202. Final Scope Section 3.2.3 – EIS Issues / Air Emissions. The issue of air emissions is addressed in Final EIS Section 4.2.7, Section 5.2.7, and Section 6.2.7.

203. Final Scope Section 3.2.4 – EIS Issues / Odor and Noise. The issue of noise is addressed in Final EIS Section 4.2.8, Section 4.3.8, Section 5.2.8, Section 5.3.8, and Section 6.2.8. Regarding the topic of odor, the treatment of the topic was no further than the information analyzed in the Scoping EAW.

204. Final Scope Section 3.2.5 – EIS Issues / Archaeology. The issue of archaeology is addressed in Final EIS Section 4.2.9, Section 4.3.9, Section 5.2.9, Section 5.3.9, and Section 6.2.9.

205. Final Scope Section 3.2.6 – EIS Issues / Visibility. The issue of visibility is addressed in Final EIS Section 4.2.11, Section 4.3.11, Section 5.2.11, Section 5.3.11, Section 6.2.11, and Section 6.3.11.

206. Final Scope Section 3.2.7 – EIS Issues / Compatibility with Plans and Land Use Regulations. The issue of compatibility with plans and land use regulations is addressed in Final EIS Section 4.2.1, Section 4.3.1, Section 5.2.1, Section 5.3.1, Section 6.2.1, and Section 6.3.1.

207. Final Scope Section 3.2.8 – EIS Issues / Infrastructure. The issue of infrastructure is addressed in Final EIS Section 3.2.2.1.3, Section 3.2.3.4, and Section 4.2.4.3.

208. Final Scope Section 3.2.9 – EIS Issues / Asbestiform Fibers. The issue of asbestiform fibers is addressed in Final EIS Section 5.2.7.5.

209. Final Scope Section 3.2.10 – EIS Issues / 1854 Ceded Territory. The issue of the 1854 Ceded Territory is addressed in Final EIS Section 1.2.2, Section 4.2.9, Section 4.3.9, Section 5.2.9, Section 5.3.9, Section 6.2.9, and Section 6.3.9.

210. Final Scope Section 3.3.1 – EIS Issues / Fish and Wildlife Resources. The issue of fish resources is addressed in Final EIS Section 4.2.6, Section 4.3.6, Section 5.2.6, Section 5.3.6, Section 6.2.6, and Section 6.3.6. The issue of wildlife resources is addressed in Final EIS Section 4.2.5, Section 4.3.5, Section 5.2.5, Section 5.3.5, Section 6.2.5, and Section 6.3.5.

211. Final Scope Section 3.3.2 – EIS Issues / Threatened and Endangered Species. The issue of threatened and endangered species is addressed in Final EIS Section 4.2.4, Section 4.2.5, Section 5.2.4, Section 5.2.5, Section 6.3.4, and Section 6.3.5, and the Biological Assessment and Biological Evaluation included as Appendix D of the Final EIS.

212. Final Scope Section 3.3.3 – EIS Issues / Physical Impacts on Water Resources. The issue of physical impacts on water resources is addressed in Final EIS Section 4.2.2, Section 4.3.2, Section 5.2.2, Section 5.3.2, Section 6.2.2, and Section 6.3.2.

213. Final Scope Section 3.3.4 – EIS Issues / Water Appropriations. The issue of water appropriations is addressed in Final EIS Section 4.2.2, Section 4.3.2, Section 5.2.2, Section 5.3.2, Section 6.2.2, and Section 6.3.2.

214. Final Scope Section 3.3.5 – EIS Issues / Surface Water Runoff and Erosion/Sedimentation. The issue of surface water runoff and erosion/sedimentation is addressed in Final EIS Section 4.2.2, Section 4.3.2, Section 5.2.2, Section 5.2.3, and Section 6.2.2.

215. Final Scope Section 3.3.6 – EIS Issues / Wastewater. The issue of wastewater is addressed in Final EIS Chapter 3 and Section 5.2.2.

216. Final Scope Section 3.3.7 – EIS Issues / Solid Waste. The issue of solid waste is addressed in Final EIS Section 4.2.13 and Section 5.2.13.

217. Final Scope Section 3.3.8 – EIS Issues / Cumulative Effects. The issue of cumulative effects is addressed in Final EIS Chapter 6 and Section 5.2.7 (for certain air analyses).

218. Final Scope Section 4.0 – Identification of Phased or Connected Actions. The issue of identification of phased or connected actions is addressed in Final EIS Chapter 1, Chapter 3, and Chapter 7.

219. Final Scope Section 6.0 – Special Studies or Research. The issue of special studies or research developed to support the assessment of environmental impacts is addressed in Final EIS List of References. The Final EIS's treatment of special studies or research is expanded beyond that proposed under the Final Scope.

220. Final Scope Section 7.0 – Mitigation and Monitoring. The issue of mitigation and monitoring is addressed in Final EIS Chapter 2, Chapter 3, and Chapter 5.

221. Final Scope Section 8.0 – Government Permits and Approvals. The issue of government permits and approvals is addressed in Final EIS Section 1.4.

ii. Did the RGU respond to comments?

222. In conformance with the requirement of Minn. R. 4410.2800 subp. 4B and as set forth in detail in these Finding of Fact paragraphs the DNR, as RGU, has responded to the substantive comments received during the Draft EIS and Supplemental Draft EIS review concerning issues raised in scoping. The Final EIS's treatment of these components is addressed in Finding of Facts paragraphs 223 and 224 below; each requirement is underlined at the beginning of each finding.

223. RGU Responses to Substantive Comments on the Draft EIS. The response to substantive comments on the Draft EIS is addressed in Final EIS Appendix A, Response to Comments on the Draft EIS for the NorthMet Mining Project and Supplemental Draft EIS for the NorthMet Mining Project and Land Exchange. The Final EIS's treatment of substantive comments on the Draft EIS is expanded beyond the scope of issues identified in the Final Scope.

224. RGU Responses to Substantive Comments on the Supplemental Draft EIS. The response to substantive comments on the Supplemental Draft EIS is addressed in Final EIS Appendix A, Response to Comments on the Draft EIS for the NorthMet Mining Project and Supplemental Draft EIS for the NorthMet Mining Project and Land Exchange. The Final EIS's treatment of substantive comments on the Supplemental Draft EIS is expanded beyond the scope of issues identified in the Final Scope.

iii. Did the RGU Comply with MEPA Procedures?

225. As required by Minn. R. 4410.2800, subp. 4C and as set forth in detail in these Findings of Fact, the DNR, as RGU, has prepared the Final EIS for the project in compliance with the procedures of MEPA and Minn. R. parts 4410.0200 to 4410.6500. The EIS's compliance with the requirements of law and rules is detailed as follows in Finding of Facts paragraphs 226 through 234; each requirement is underlined at the beginning of each finding.

226. Projects Requiring An EIS – Minn. R. 4410.2000. DNR's compliance with the requirements of Minn. R. 4410.2000 is addressed in Finding of Facts paragraphs 52, 112, and 116

227. EIS Scoping Process – Minn. R. 4410.2100. DNR's compliance with the requirements of Minn. R. 4410.2100 is addressed in Finding of Facts paragraphs 55 through 81, and Finding of Facts paragraphs 83 and 116.

228. EIS Interdisciplinary Preparation – Minn. R. 4410.2200. DNR's compliance with the requirements of Minn. R. 4410.2200 is addressed in Finding of Facts paragraphs 86 and 88, and Finding of Facts paragraph 123.

229. Content of EIS – Minn. R. 4410.2300. DNR's compliance with the requirements of Minn. R. 4410.2300 is addressed in Finding of Facts paragraphs 92 through 100, Finding of Facts paragraphs 127 through 138, and Finding of Facts paragraphs 148 through 171.

230. Incorporation by Reference in EIS – Minn. R. 4410.2400. DNR's compliance with the requirements of Minn. R. 4410.2400 is addressed in Finding of Facts paragraphs 99, 136, and 156.

231. Incomplete or Unavailable Information – Minn. R. 4410.2500. DNR's compliance with the requirements of Minn. R. 2500 is addressed in Finding of Fact paragraphs 227, 232, and 233.

232. Draft EIS – Minn. R. 4410.2600. DNR's compliance with the requirements of Minn. R. 4410.2600 is addressed in Finding of Facts paragraphs 101 through 110 and Finding of Facts paragraphs 139 through 147.

233. Final EIS – Minn. R. 4410.2700. DNR's compliance with the requirements of Minn. R. 4410.2700 is addressed in Finding of Facts paragraphs 148 through 185.

234. Determination of Adequacy – Minn. R. 4410.2800. DNR's compliance with the requirements of Minn. R. 4410.2800 is addressed in Finding of Facts paragraphs 189 through 239.

2. 2016 Determination of Adequacy—Consideration of 2015 Final EIS Comments

235. The Co-lead Agencies received 30,539 submissions during the public comment period on the adequacy of the Final EIS. Of these 29,747 were form letter/email submissions where the text was identical or substantively identical across the submissions. Of these, 29,362 were classified as form letter non-variants where the text was not substantively altered. The remaining 385 submissions were classified as form letter variants, which exhibited text that was altered by the sender by deleting standard text and/or by adding sender-composed text. Of the submissions identified in Finding of Fact paragraph 185, DNR received 792 unique submissions where the text appeared to be composed entirely by the sender and did not appear to be a form letter submission.

236. In assessing the adequacy of the Final FEIS, the DNR carefully reviewed and considered the comments received during the Final EIS public review period identified in Finding of Fact paragraph 185. Because the volume of comments received on the Final EIS was significantly large and many comments raised similar issues, the comments were again sorted by content into issue areas. By organizing comments by issue the DNR was able to obtain a deeper understanding of the nature of the public concerns around any given issue, evaluate the comments more comprehensively, assure consistent consideration of comments, and increase public transparency through organization.

Following is a listing of the issues raised in the Final EIS comment letters:

Air Quality	Mercury
Alternatives or Mitigation	NEPA
Aquatic Species	Noise and Vibration
Cultural Resources	Other
Cumulative Effects	Project Description
Editorial	Permitting and Regulatory Considerations
Financial Assurance	Objections on the USFS Draft Record of Decision
General Topic or Objection	Socioeconomics and Environmental Justice
Geotechnical Stability	USACE 404 Permit
Hazardous Materials	Vegetation
Human Health and Safety	Water Resources
Land Exchange	Wetlands
Land Use, Recreation, and Visual Resources	Wildlife
MEPA Adequacy	Wilderness and Other Special Designation Areas

237. Unlike with comments on the Draft EIS and Supplemental Draft EIS, Minnesota Rules, part 4410.2800 does not require a RGU to respond to comments on the Final EIS. *See* Minn. R. 4410.2700 and Minn. R. 4410.2800. Nonetheless, DNR documented its consideration of the comments on the adequacy of the EIS by coding the comments in terms of: issue; nature (substantive or non-substantive; new or previous; classification relative to conditions for adequacy). In addition, the coding included references to existing information. Where appropriate, DNR provided additional explanation of its consideration of the comment. This consideration of Final EIS comments is incorporated as Exhibit A ("RGU Consideration of Comments on the Final EIS") to the Record of Decision.

238. Issues of particular note and/or controversy raised in comments on the Final EIS are summarized as follows:

Thematic Responses to Comments. Some commenters expressed concern regarding a thematic approach to comment response. Commenters identified instances where they believed the response to comments on the Supplemental Draft EIS did not sufficiently address their comments or failed to respond.

DNR Consideration: It is reasonable for the RGU to group identical or similar comments together, in this instance into themes, and to prepare a single answer for each group. This is also consistent with the rules governing the federal NEPA process that permits federal agencies to consider and respond to comments both individually and collectively. *See* 40 C.F.R. 1503.4(a). By organizing comments by theme, the Co-lead Agencies could obtain a deeper understanding of the nature of the public concerns around any given issue, address the comments more comprehensively, assure consistent consideration of comments, and increase transparency and accessibility to both public comments and agency responses. To respond to comments individually in a non-thematic way would increase

confusion for both the RGU and those members of the public attempting to engage in the environmental review process.

The thematic response was particularly valuable in the case of this EIS, on which the DNR received tens of thousands of submittals (i.e. comment letters), many containing numerous comments on multiple issues in a single submission. To fully and carefully evaluate the comments, comments were assigned to 23 different issue areas that included 580 themes.

DNR believes using a thematic approach provides for better understanding of the comments and the agency's consideration. The level of detail in a thematic response varies as a function of the comment's point regarding potential impacts, choices among alternatives, or potential mitigation measures. More specific comments justified greater substance and detail in the thematic response. Thus, responses varied in level of detail across the 580 themes.

Regarding assertions that DNR did not respond to comments on the Supplemental Draft EIS, DNR acknowledges, given the vast number of comments and the breadth and volume of comments in an individual submittal, there was a limited potential where individual comments could be missed. In consideration of these assertions, DNR reevaluated its responses to comments and, in some instances, is providing additional documentation of its consideration of Final EIS comments that expressed this concern. See Exhibit A to this Record of Decision. DNR has thus satisfied both the procedural and substantive requirements of Minnesota Rules, part 4410.2800, regarding responding to comments on the Draft and Supplemental Draft EISs.

Water Resources Impact Assessment. Commenters voiced concerns with the adequacy of evaluation criteria and location, existing conditions as baseline, and impact assessment modeling for both surface water and groundwater resources. Other issues included calibration to artificially high Northshore Mine pit lake elevations and predicted efficiency of Tailings Basin seepage capture measures.

DNR Consideration: Regarding water quality evaluation criteria, it is reasonable for them to be based on applicable water quality standards in the form of a combination of health-based water quality standards for: 1) drinking water sources, and 2) mercury in surface water (fish consumption), and 3) aquatic life-based standards for surface waters. For groundwater resources, the applicable evaluation location is intended to be at the property boundaries or where groundwater intercepts surface water features, not where a pollutant may actually enter groundwater. This is consistent with MPCA permitting practices to adequately reflect the condition of the underground water and the effects of pollutants upon the specified water uses. An NPDES permit would be required for any point source discharge that adds pollutants to waters of the U.S.

Furthermore, the environmental review process envisions that not all contingencies may be known, or knowable or quantifiable, during the environmental review process without extensive speculation. In those instances for water quality impact assessment at the Plant Site, the Continuation of Existing Conditions scenario is a reasonable way from which to measure the direction, degree, and magnitude of potential future change attributed to the Proposed Project. This approach affords a means of determining the relative efficacy of impact avoidance and/or

minimization measures. The EIS addresses the No Action Alternative qualitatively. This analysis assumes that Cliffs Erie, as the owner of the former LTVSMC processing plant and Tailings Basin, would continue to complete closure and reclamation activities

DNR believes the impact assessment modeling provides a reasonable and conservative predictive basis for the project's potential adverse effects on water quality. This is accomplished by using the P90 model results (i.e., results within a 90 percent confidence) when comparing simulation results to water quality evaluation criteria. If the P90 concentration of a solute equals the evaluation criteria, then there is a 10 percent probability that the actual concentration would exceed the criteria. The P90 concentration is not a "worst-case" value, but rather a model threshold selected so that plans are based on solute concentrations that are very probably higher than will actually occur. DNR acknowledges that, while the water quality model is designed to provide a reasonable estimate for water quality effects and to help plan for water treatment, it does not a guarantee the outcomes. Actual protection of the quality of receiving waters would rely on the monitoring and contingency plans implemented during the permitting and the financial assurance process.

DNR disagrees that establishing an "artificially high" Northshore Mine pit lake water level constitutes calibrating to "an extreme event." It is reasonable and entirely consistent with the Final Scope for the Northshore Mine pit lake water levels to be modeled artificially high since such an approach would lead to conservatively high groundwater inflows to the proposed NorthMet pits during operations prior to the time the NorthMet pit refills with water during the transition to closure and reclamation. This is also consistent with the Final Scope's requirement to use hydrologic modeling to estimate the volume, timing, and outflow (i.e., overflow) from the re-filled West Pit lake post-mining in order to determine potential treatment needs for reclamation.

Regarding capture efficiency assumptions for the Plant Site seepage from the Tailings Basin, the Final EIS relied on revised cross-sectional models that included new bedrock hydraulic conductivity data and considers the presence of an upper, more permeable bedrock zone directly beneath the slurry wall. Sensitivity analyses included variable bedrock conductivity and different upper bedrock zone thicknesses up to 100 feet. These analyses estimated capture efficiencies substantially greater than 90 percent, even under the assumption that the upper zone contains more permeable bedrock.

Human Health. Commenters raised concerns with the adequacy of the human health risks analysis, including the project's affect on air quality, drinking water resources, and food sources, particularly subsistence fish consumption. Comments assert a Health Impact Assessment (HIA) should be conducted to predict and manage health effects on the community from the proposed project.

DNR Consideration: The Final EIS analyzes risks to human health, specifically how the proposed project could affect air quality, surface and ground water quality, and toxics, including effects to drinking water and food sources as required by MEPA and NEPA. The assessment of public health impacts relies on water and air evaluation criteria and regulatory standards that are protective of human health. Preparation of an HIA was not scoped into the EIS. The Final EIS does include extensive public health information relative to air and water quality, and DNR believes additional information that might be generated from such a study would not significantly inform decisions about permits for the project or materially augment the information already available to the public.

Mercury. Commenters expressed concerns with the adequacy of assessing mercury-related impacts including errors in characterizing existing concentrations at the Tailings Basin; increased potential for methylmercury production in wetlands from project-related air deposition, sulfate, and water level fluctuations; and impacts that could result from routine lapses in seepage collection at the proposed Tailings Basin. Other issues related to estimates of mercury sequestration in tailings, and Mine Site mass balance estimates for total mercury load in the West Pit.

DNR Consideration: The Final EIS addresses the primary mercury-related concern by assessing potential mercury deposition and bioaccumulation in fish using the Air Emissions Risk Assessment (AERA) method that follows USEPA guidance and is considered protective of human health.

A commenter noted an error in characterizing existing mercury concentrations at the Tailings Basin. The commenter correctly observed that mercury concentration units were not converted to ng/L (which they should have been) to produce Final EIS Table 4.2.2-4. DNR subsequently converted the mercury data and reevaluated the resulting data set. After this correction, mercury levels still remain below the GLI standard of 1.3 ng/L. DNR believes that this correction does not materially affect the characterization of existing mercury concentrations in the Tailings Basin.

It is correct that the Final EIS analysis does not include specific discussions on sulfur dioxide (SO_2) or sulfur aerosol mist (SAM) impacts to "wetlands," although it does include discussion on impacts to lakes. The Final EIS does, however, include a discussion of the impacts to wetlands from the larger source of sulfur from particulates and fugitive dust ($\geq$ approximately 80% of calculated potential sulfate additions). Considering another qualitative, but smaller, increment from SO_2 and/or SAM to the quantitative impact analysis already conducted for particulate sulfur on wetlands in the Final EIS does not change the overall conclusions of that analysis.

The Final EIS acknowledges that, under certain localized conditions, the introduction of sulfate to a water resource may contribute to the production of methylmercury. However when taken as a whole, the project would result in a reduction of the loading and concentration of sulfate within the Embarrass River watershed. This overall reduction would likely not result in adverse effects on downstream resources from mercury methylation. It is this concept that formed the basis for the MPCA strategy (MPCA 2006a) to address the indirect effects of sulfate on methylmercury production.

It is recognized that water fluctuations in wetlands and the wetting and drying of peat soils has an effect on the potential generation and export of methylmercury. The augmentation proposed for the tributary streams north of the Tailings Basin will help stabilize stream flows and minimize the degree of water fluctuation within the adjacent wetlands, and thus also minimize the generation and transport of methylmercury.

DNR's consideration of the performance of the Tailings Basin seepage collection system anticipates the need for routine maintenance or unforeseen circumstances that could influence system capture efficiency. These situations would be temporary and are not expected to result in appreciable water quality impacts, including the risk of mercury methylation. The permit to mine requires an applicant

to demonstrate plans for engineering design and methods for mining operations and reclamation. *See* Minn. R. 6132.110, subp. 6C. For the NorthMet Mining Project, the Tailings Basin would require periodic maintenance to remain effective, with details determined in permitting. If the performance is not as predicted and groundwater or surface water downgradient of the Tailings Basin has compliance issues, contingency mitigation includes installation of interception wells that would collect groundwater flows contributing to the issue.

Comments regarding the potential for mercury to be sequestered in tailings focus on the 2006 National Technical Systems, Inc. bench study. DNR notes a simple arithmetic comparison of means does not represent the processes impacting mercury concentrations as water flows through the tailings. Specifically, the mean well data are from a different time period (2007-2013) than the mean pond data (2001-2004), and therefore a direct relationship between the two cannot be drawn. It should also be noted that the pond sampling for mercury occurred from four (4) to 11 years before the toe well sampling and, depending on hydrologic properties of the tailings, may not represent the starting pond composition of the water collected in the toe wells. Thus, there may be no relationship because of the different time frames involved. It is also scientifically incorrect to compare well water in a tailings pond to water in a pore fluid environment outside the basin and conclude that mercury has been leached from the tailings along the flow path. This is because water in the tailings ponds would be affected by its own local environmental processes, with some of these environmental processes noted in the comment. In general, standing water tends to lose mercury over time as the mercury is lost to sediment or degasses Hg^0 to the atmosphere.

Regarding the estimated total mercury load for the West Pit, DNR acknowledges that the NorthMet ore and waste rock contain trace amounts of mercury. Mass balance modeling and analog data from other natural lakes and mine pit lakes in northeastern Minnesota suggest that the mercury concentration in the West Pit Lake would stabilize at approximately 0.9 ng/L. This value accounts for the mercury cycling identified in the comment.

Emissions of mercury from the mine would be addressed in permitting. MPCA would determine, in the course of its decision-making for a permit governing air emissions, what regulations or controls should be imposed upon potential sources of mercury that could impact water resources, including fugitive emissions. Similarly, potential water quality concerns associated with mercury, sulfate, and methylmercury, would be addressed in the context of NPDES permitting as well as wetlands permitting, which would address water quality monitoring requirements.

The Final EIS evaluates the potential impact of project-related mercury, sulfate, and methylmercury generation on downstream aquatic resources (i.e., fish tissue concentrations). DNR does not believe that further detailed evaluation of mercury impacts is warranted for environmental review purposes.

Tailings Basin Stability. Commenters voiced concerns about the adequacy of assessing the potential for catastrophic failure of the Tailings Basin. Specific note was made of the Mount Polley incident in British Columbia. Alternative tailings management strategies such as dry stacking were raised in the Final EIS comments.

DNR Consideration: DNR increased the level of information and analysis on tailings basin geotechnical stability in the EIS beyond that envisioned in the Final Scope. As reported in the 2009 Draft EIS, the NorthMet Tailings Basin and Hydrometallurgical Residue Facility embankments would have had a low margin of safety due to fine tailings and underlying soils in the existing LTVSMC Tailings Basin. In response, the project was modified to include additional rock buttressing. The design criteria set out in the Final EIS meet widely accepted applicable dam safety criteria and are adequate and consistent with the state of the art in the mining industry. These disclosures are commensurate with the level of risk attributable to this type of design. Additionally, the design of the proposed NorthMet Tailings Basin is sufficiently different (i.e., shallower slopes, use of buttressing, and incorporation of cement deep soil mixing technology) from the Mount Polley dam design that a direct comparison cannot be made between the Mount Polley dam and the project proposal.

Alternatives. Commenters expressed concerns with the adequacy of the EIS's consideration of alternatives. For dismissed alternatives, concerns were offered regarding the economic assumptions behind the Underground Mining Alternative, justification for dropping the West Pit Backfill Alternative, and evaluating alternative tailings basin locations for dry stacking of tails. Defining the project purpose and need too narrowly was also raised in the comments.

DNR Consideration: When evaluating project alternatives in an EIS, it is appropriate to consider economic feasibility as a function of project purpose. To verify the economic viability of the underground mining alternative, DNR independently reviewed the Proposer's cost assessment of developing and operating an underground mine at the NorthMet site. DNR acknowledges that this assessment included uncertainty but believes this is a reasonable approximation of potential economic feasibility for the purposes of alternatives screening.

DNR's consideration of the West Pit Backfill Alternative appropriately weighed the potentially significant adverse or beneficial environmental, social, and economic effects as required. *See* Minn. R. 4410.2300, subp. G. DNR acknowledges potential environmental benefits associated with this alternative, but importantly some degree of vegetation and wetland impact is unavoidable even with backfilling, and the proposed closure condition is consistent with the Mineland Reclamation Rules for this type of facility. *See* Minn. R. 6132. The environmental benefit attributed to this alternative in the comments is not significantly greater than that associated with the impact avoidance and minimization measures already identified for the proposed action.

The Final EIS notes that a dry stack tailings alternative technology does not have significant environmental benefit over the proposed project. The dry stacking tailings basin option would require a liner and thus could not be placed on the existing Tailings Basin. This would require the conversion of additional green space for this proposed project; this factor alone increases the potential impacts of the project. Additionally, alternative tailings basin locations for dry stacking, the locations considered by DNR from Final Scope Section 2.3.2, Tailings Disposal, were not available for potential acquisition and use. The sites were either controlled by another party unlikely to sell or subject to other ownership constraints. Other considerations include that installing a liner on the existing tailings basin is not feasible and implementation of this technology would not address existing tailings basin legacy issues that are addressed under the proposed project.

Some of the project commenters objected to the stated project purpose and need. The applicable rule offers the proposed project must be described with no more detail than is absolutely necessary to allow the public to identify the purpose of the project. See Minn. R. 4410.2300, item E. The project purpose, in this instance, was defined in sufficient detail to allow the public to understand the purpose and scope of the project. In addition the project definition did not preclude consideration of the full range of alternatives. Moreover, many elements of the identified project alternatives were ultimately adopted and incorporated into the NorthMet Mining Project proposed action.

Mine Site Bedrock Groundwater Northward Flowpath. Commenters raised concerns with the adequacy of the EIS's treatment of a potential northward bedrock groundwater flowpath between the NorthMet pits and Northshore Mine pits in closure. Comments urged that impacts to the Boundary Waters Canoe Area Wilderness should be assessed and claimed that proposed mitigation may be ineffective.

DNR Consideration: Although not identified as an issue for assessment in the EIS, DNR considered potential future operations at the Northshore Mine against available information. While DNR does not believe it would be likely, the agency cannot rule out the possibility that future operations at the Northshore Mine could induce northward groundwater bedrock flow from the NorthMet Mine Site. This might happen if there is insufficient natural downward leakage into bedrock from the overlying wetlands between the Northshore Mine and the NorthMet Mine from surficial materials located between the proposed NorthMet Mine (during closure) and the Northshore Mine (in future operations and closure). If there is sufficient downward leakage, then there would be a groundwater flow divide between the two mines and no continuous one-way flow between the facilities. If natural leakage is insufficient to maintain a groundwater flow divide between the two facilities, then a northward groundwater flowpath is possible.

It is possible to detect and prevent a northward flowpath before any impacts occur because conditions potentially supporting development of a northward flow path would not exist until water levels in the NorthMet pits are higher in elevation that at the Northshore Mine pits. Final EIS Section 5.2.2.3.6 details specific monitoring requirements to be initiated no later than mine year 1, including expansion of the existing system of bedrock groundwater monitoring wells. The goal of the monitoring would be to determine future bedrock flow direction immediately north of the proposed NorthMet pits in order to determine whether there is a need for engineered preventive mitigation measures. Final EIS Section 5.2.2.3.5 identifies known measures that could be applied successfully to prevent a northward flow in the event a potential for northward flow is detected. Thus, there would be no impacts to the Boundary Waters Canoe Area Wilderness from the proposed NorthMet project.

Duration of Water Treatment. Commenters raised concerns about the assumption in the EIS that mechanical water treatment would be required indefinitely at the Mine Site and Plant Site. It was argued that the EIS model should be used to provide a definitive estimate of the duration for treatment necessary to meet applicable water quality standards. Opinions were offered that indefinite water treatment is not consistent with the mineland reclamation rules at Minn. R. 6132.

DNR Consideration: The commenters correctly note the Final EIS reports that water treatment systems in some form (i.e., mechanical and/or non-mechanical) and at some scale would be needed indefinitely at the Mine Site and Plant Site. This is principally due to the effluent water quality necessary for the project to comply with the sulfate wild rice standard of 10 mg/L. Because the water models focused on predicting peak loads and were not designed to estimate treatment duration, they do not capture all the factors that might influence the duration of treatment. It is therefore inappropriate to use them for that purpose. With mechanical treatment as proposed, the project is predicted to meet applicable water quality evaluation criteria. The WWTP and WWTF operating and replacement costs would be included in long-term financial assurance estimates. Regardless, the comments submitted on the Final EIS regarding the duration of treatment request detail that goes beyond that necessary to understand potential impacts and available mitigation. Minnesota's Non-ferrous Rules contemplate that ongoing maintenance after cessation of mining activities may be required and is permissible. *See* Minn. R. 6132.0200, 6132.0300, 6132.1100, 6132.2300, 6132.2600, 6132.2200, 6132.4800.

Financial Assurance. Commenters raised concerns with the adequacy of the level of detail in the EIS on potential financial assurance provisions if the project were approved. Commenters requested greater specificity on the types of financial instruments, actual dollar estimates, and enforcement measures.

DNR Consideration: The project requires a State of Minnesota Permit to Mine that must satisfy the requirements of Minnesota Rules, part 6132.1200, regarding financial assurance. The Final EIS provides available information regarding potential financial assurance requirements under any permit to mine that may be issued for the project. The additional details requested in the comments are not available and would be addressed during permitting. Comments submitted on the Final EIS regarding potential financial assurance requirements request detail beyond that necessary to understand potential impacts and available mitigation appropriate to an EIS. Additional information on this topic would be developed for consideration during project permitting.

Land Exchange. Commenters raised concerns with the adequacy of the EIS's treatment of the proposed land exchange between the USFS and the Proposer. Issues identified in the comments included objections to the USFS proposal as defined in the EIS, impacts to federally-listed endangered species, and public policy implications.

DNR Consideration: Objections to the proposed land exchange will be considered by the USFS under that agency's regulations. USFS is complying with all federal statutes, including those that govern land exchanges and the Endangered Species Act. The Record of Decision from the USFS will contain the rationale for the selected alternative under the land exchange, as well as a discussion of how the public interest would be served under 36 CFR § 254.3(b).

Cumulative Impacts. Commenters raised concerns about the adequacy of the EIS cumulative effects analysis. Issues raised included lack of consideration of historic or forecasted trends, requests to assess speculative actions in the analysis, and criticism of limiting the assessment of cumulative

wetlands impacts only to the Partridge River and Embarrass River watersheds. Assertions were made that the EIS should have assessed cumulative effects to the 1854 Treaty Area as a historic district.

DNR Consideration: The Final EIS's cumulative effects analysis provides a reasonable basis of potential future development associated with historic or forecasted trends. This is accomplished through the Final EIS identifying 30 past, present, and/or reasonably foreseeable actions related to mining activity, and also identifying 10 speculative mining-related actions. Mining is ongoing and similar-type activity can be expected into the future.

Greater consideration of speculative actions is not required in environmental review. Minnesota rule defines "cumulative potential effects" in part to involve "the incremental effects of the proposed project in addition to other projects in the environmentally relevant area that might be reasonably expected to affect the same environmental resources." See Minn. R. 4410.0220, subp. 11. The Final EIS defines reasonably foreseeable as those actions that are included in approved planning documents and have approved funding, are in permitting, or have a currently active federal or state permit or site plan application under review.

Concern was expressed that the cumulative effects assessment area for wetland resources was limited to the Partridge and Embarrass Rivers watersheds. The overall EIS analysis area was expanded from that identified in Final Scope Section 3.3.8.7 to include both the Embarrass River watershed along with the Partridge River watershed. Addressing both watersheds was reasonable because these were the watersheds where the direct and/or indirect impacts of the project were possible. Expanding the cumulative effects assessment area to include the St. Louis River would not provide meaningful information about the potential cumulative effects attributable to the project in concert with other reasonably foreseeable actions. Similarly, expanding the wetlands cumulative effects analysis to the entire 1854 Treaty Area would not provide meaningful information.

Wetlands. Commenters raised concerns about the adequacy of the EIS's evaluation of wetland impacts because of the lack of quantitative modeling for assess of indirect wetland impacts, improper application of the Federal Mitigation Rule, and potential impacts to ombrotrophic bogs. Other issues noted in the comments included the lack of justification for agency reliance on the analog method, inadequacy of proposed compensatory mitigation, and inconsistent treatment of wetland connectivity to surficial and bedrock aquifers, especially for the 100 Mile Swamp.

DNR Consideration: The Final Scope did not require modeling for assessment of wetland impacts. The scope only identified that wetland impacts associated with the entire project be identified and discussed in the EIS. The possibility of using the EIS's groundwater flow model, which was required under Final Scope Section 6.2 to predict groundwater inflows to the mine pits, was considered for assessing potential indirect wetland impacts that might occur due to drawdown effects from pit dewatering. Ultimately, it was determined that the MODFLOW model could not reliably model the complex mix of fractured bedrock, glacial till, and wetland soils in the project area for purposes of estimating potential drawdown effects to wetlands. Thus the analog method was used to assess potential indirect wetland impacts and is appropriate.

The USACE will apply the Federal Mitigation Rule to determine the suitability of proposed compensatory mitigation for project-related direct and indirect wetland impacts. The Final EIS identifies, to the extent prudent and feasible, that the same types of wetlands are to be replaced in the same watershed, before or concurrent with the actual alteration of the wetland. Under the state Wetlands Conservation Act, for wetlands in counties where 80 percent or more of pre-settlement wetlands exist, minimum replacement ratio requirements are as determined by mitigation location and type. This would apply to St. Louis County where the proposed project is located. *See* Minn. Stat. §103G.222, subd. 1.

The Final EIS addresses impacts to both minerotrophic and ombrotrophic wetlands.

It was not necessary to expressly characterize the vertical hydraulic conductivity for wetlands and surficial deposits at the 100 Mile Swamp beyond the data already obtained. Similarly it was also not necessary to precisely determine the downward recharge flux from the 100 Mile Swamp into the bedrock groundwater system north of the Mine Site. The hydraulic conductivity values suggested by the comment are relevant to modeling maximum pit inflows only in a modeling construct.

The Final EIS addresses the potential for wetland impacts and mitigation consistent with the Final Scope.

Mitigation Strategies. Commenters raised concerns that the pollution mitigation schemes would not be affordable or effective, especially for dealing with irreversible and perpetual pollution from the project. Comments noted the problematic nature of contingency mitigations due to a lack of evidence that these measures would be effective. Commenters also raised concerns on adaptive management and monitoring as a mitigation strategy in the Final EIS.

DNR Consideration: The Final EIS extensively documents the evolution of the project and features proposed to avoid impacts altogether, or minimize impacts by limiting the degree or magnitude of potential project-related change. Considering the feasibility of an impact avoidance and/or minimization measure or strategy includes an assessment of potential effectiveness. If the project receives all required permits, state and federal agencies will monitor the actual effectiveness of any approved and implemented mitigation measures, which would be imposed as part of permit conditions. The permitting process may also lead to and require additional mitigation measures beyond those identified in the Final EIS.

DNR acknowledges that monitoring would be a critical component of any regulatory program for the proposed project. Through monitoring, regulatory agencies with oversight of the project would document actual project-related change, which in turn would inform facility operation and maintenance, and potentially the selection and implementation of adaptive or contingency mitigation measures to address unexpected impacts. For adaptive measures, these would involve modification of existing project elements to improve some aspect of system performance. Contingency measures are not part of the proposed project but could be applied if determined necessary. DNR has the authority to require remedial action for unforeseen effects, and to adjust financial assurance on at least an annual basis, when changes are necessary to address project impacts.

Wild Rice. Commenters expressed concerns that project implementation would damage wild rice resources.

DNR Consideration: The Final EIS relies on the MPCA's current regulatory structure in assessing potential project impacts to wild rice resources. This reliance is consistent with MPCA draft staff recommendations. The proposed Mine Site and Plant Site engineering controls would prevent an increase in sulfate concentrations in the Partridge River and would decrease sulfate concentrations in the Embarrass River. The Final EIS recognizes that the MPCA is evaluating the current wild rice sulfate water quality standard. Future change to the wild rice sulfate standard, if any, is unknown, and regardless can be addressed in permitting if changes are adopted by the MPCA.

Airborne Amphibole Mineral Fibers. Commenters raised concerns on the potential release of amphibole fibers and assert the analysis of this issue in the Final EIS is insufficient. Commenters advocated for human health risk assessments to be expanded to include scenarios of worker exposure to amphibole fibers, which should be based on best available information.

DNR Consideration: The Final Scope required the EIS to provide information on the presence of fibers in the NorthMet deposit, identify potential impacts, and propose mitigation to minimize impacts. The Final EIS satisfies these requirements by identifying that the vast majority of potential project-related emissions of fibers would occur from the ore-crushing operations at the Plant Site. The project incorporates fine-particulate matter emission controls to minimize potential release of fiber emissions. The Final EIS also evaluates the potential for lesser, more minor emissions from the Tailings Basin and Mine Site. The Tailings Basin facility would be operated to minimize all fugitive particulate emissions, while potential emissions at the Mine Site would be reduced by operating larger haul trucks.

Regarding expanding the EIS's human health risk assessments, the Final EIS provides sufficient analysis about the potential for project-related fibers emissions to affect human health. The EIS's analysis benefits from both the MDH study of cancer incidence rates in Northeastern Minnesota and the University of Minnesota School of Public Health's Taconite Workers Study. As evidenced in the Final EIS, both studies found an increased risk of certain respiratory cancers in Iron Range mine workers (when compared to Minnesota as a whole). But neither study was able to definitively link this observed increase in risk with exposure to occupational amphibole mineral fibers. Consistent with these reports, amphibole fiber project emissions would be addressed in permitting, where on-site worker health and safety would be regulated by other agencies such as the Mine Safety and Health Administration (MSHA), the National Institute for Occupational Safety and Health (NIOSH), and the Occupational Safety and Health Administration (OSHA).

Use of Proposer Prepared Materials. Commenters raised concerns that the underlying studies and other materials for the Final EIS were completed by the project proposer or its consultant. Commenters alleged that the information was not independently verified by the Co-lead Agencies and that modeling should have been done by an independent party. Commenters assert the Final EIS appears to be largely based on data that was provided by PolyMet.

DNR Consideration: Consistent with Minnesota Rules, 4410.2100, subp. 6G, both the Draft and Final Scope identified that EIS preparation would require many reports and studies that would be supplied by the Proposer, but that the content would be independently reviewed by state and federal agencies or the EIS contractor. No comments were received from the public objecting to this working method during the comment period for the Draft Scoping Document.

During development of the EIS, the Co-lead Agencies and/or ERM independently reviewed materials submitted by the proposer and its consultant, including data, work plans, reports, and other materials related to EIS analyses. In addition, quality assurance and quality control assessments were completed for all modeling prior to use. This review and revision process resulted in multiple versions of many of the underlying documents, as evidenced by the version number assigned to these documents (e.g.; *NorthMet Plant Site Water Modeling Work Plan, Version 6; NorthMet Project Water Modeling Data Package, Volume 1-Mine Site, Version 14).* Where applicable, version numbers are included within the reference listings contained in the Final EIS Reference List.

239. Comments received after the close of the Final EIS review period do not bear on the EIS adequacy decision. The DNR will provide, upon request, copies of any comment submissions received after the close of the comment period to all permitting agencies and the project proposer for consideration in project decision-making.

CONCLUSIONS

1. The DNR is charged with determining the adequacy of the Final EIS for the NorthMet Mining Project and Land Exchange. The Final EIS meets the content requirements of EQB Rules, part 4410.2300.

2. The DNR prepared the EIS in compliance with the procedures of Minnesota Statutes, section 116D.04 and Minnesota Rules, parts 4410.0200 to 4410.6500.

3. The public has been afforded opportunities for input to the scope of the EIS, and the content of the Draft EIS, Supplemental Draft EIS, and Final EIS, as well as the adequacy of the Final EIS in accordance with all applicable provisions of MEPA and the EQB Environmental Review Program Rules.

4. The information presented in the Final EIS adequately addresses the issues identified in the Final Scope.

5. The proposed action is described in sufficient detail.

6. The EIS adequately analyzes significant environmental impacts.

7. The EIS adequately presents alternatives to the proposed action and their impacts.

8. The EIS adequately presents methods by which adverse environmental impacts can be mitigated.

9. The EIS adequately presents the economic, employment, and sociological effects that cannot be avoided should the proposed action or an alternative be implemented.

10. The Final EIS is adequate because it meets the criteria set forth in Minnesota Rules, part 4410.2800, subpart 4, which require that it:

    a. addresses the potentially significant issues and alternatives raised in scoping so that all significant issues for which information can be reasonably obtained have been analyzed in conformance with part 4410.2300, items G and H;
    b. provides responses to the substantive comments received during the draft [and supplemental draft] EIS review concerning issues raised in the scoping process; and
    c. was prepared in compliance with the procedures of the Minnesota Environmental Policy Act and EQB Rules, parts 4410.0200 to 4410.6500.

11. Findings that might properly be termed Conclusions and any Conclusions that might properly be termed Findings are hereby adopted as such.

ORDER

Based upon the Findings of Fact and Conclusions contained herein and the entire record of the proceedings:

The Minnesota Department of Natural Resources hereby determines that the Final Environmental Impact Statement for the proposed NorthMet Mining Project and Land Exchange in St. Louis County, Minnesota is adequate.

Approved and adopted this 3rd day of March, 2016.

STATE OF MINNESOTA
DEPARTMENT OF NATURAL RESOURCES

Tom Landwehr
Commissioner