



Findings of Fact and Decision Rationale for Endangered and Threatened Species Taking Permit #23235

Project: NorthMet Project, St. Louis County, MN

Applicant: Poly Met Mining, Inc.

Date: November 1, 2018

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Division of Ecological and Water Resources
Minnesota Department of Natural Resources

History of Permit Application

1. Poly Met Mining, Inc. (“Poly Met”) has proposed to construct the NorthMet Mining Project (the “Project”) in St. Louis County, in a region that contains several existing mines. The Project is approximately 60 miles north of Duluth, Minnesota and about 5 miles north of Hoyt Lakes, Minnesota, consisting of both a mine site and a plant site. The mine site is east of the plant site, a former LTVSMC taconite plant property, and is connected by an 8-mile transportation corridor. More precisely, the Project’s location is in: Sections 5 and 6, Township 58 North, Range 14 West; Sections 1, 2, 3, 4, 9, 10, 11, 12, 16, 17, and 18, Township 59 North, Range 13 West; Sections 2, 3, 4, 5, 8, 9, 10, 11, 13, 14, 15, 16, 17, 18, 20, 23, 24, 29, and 32, Township 59 North, Range 14 West; and Sections 32, 33, and 34, Township 60 North, Range 14 West. (See *Takings Permit Application: NorthMet Project* (the “Application”), Large Figure 2). The Project seeks to develop a mine and associated processing facilities for the extraction of copper, nickel, and platinum group elements from the NorthMet Deposit within the Duluth Complex in Northeastern Minnesota.
2. The *NorthMet Mining Project and Land Exchange, Final Environmental Impact Statement (November 2015)* (the “FEIS”) and the *Wetland Replacement Plan (January 2017)* describe the Project in detail. Notably, these documents provide the purpose and need for the Project in Section 1.2 of the FEIS and in Section 4.0 of the Wetland Replacement Plan, and describe the projected activities of the mining operation in Section 3.0 of the FEIS and in Section 5.0 of the Wetland Replacement Plan.
3. On November 28, 2017, Poly Met submitted an application to the DNR for a Permit to Take Endangered or Threatened Species incidental to development of the Project. The application proposed to take a population of *Caltha natans* (floating marsh marigold) located in Section 1 of Township 59N, Range 13W, as identified in a 2004 survey. In response, recognizing that the footprint for the project had changed over time, the DNR recommended that botanical surveys be updated in 2018 in accordance with a survey plan that had been reviewed and approved by the DNR. The DNR further recommended that, if the survey results are materially different, Poly Met update its application to reflect the results of the updated survey. Finally, the DNR noted that, as a condition of obtaining a takings permit, the survey report upon which the application is based must first be reviewed and approved by the DNR.

NorthMet Mining Project / Findings of Fact & Decision Rationale

4. On May 24, 2018, Poly Met's consultant, Barr Engineering Company ("Barr"), submitted a *Poly Met Sensitive Plant Species Survey Work Plan* ("Work Plan") to the DNR for review to ensure that the 2018 botanical survey and report would comport with DNR-approved methodology.
5. In the Work Plan, Poly Met recounted previous botanical surveys and mapped the areas surveyed. (See Work Plan, Large Figure 4, for location of previous surveys; see Work Plan, References, for full citations of previous surveys) These surveys included:
 - Foth & Van Dyke Associates, Inc. conducted a sensitive plant species survey in Sections 2, 3, and 10 of Township 59N and Range 13W in 1999, prior to on-site mineral exploration by Poly Met (Foth & Van Dyke Associates, Inc. 1999). No state endangered or threatened vascular plant species were identified during this survey per Minnesota's 2013 List of Endangered, Threatened, and Special Concern Species (DNR 2013).
 - Cindy Johnson-Groh conducted a sensitive plant species survey in Sections 2, 3, 10, 11, and 16 of Township 59N and Range 13W in July 2004 to assess the presence of *Botrychium* (moonwort) species in the vicinity of the Project (Johnson-Groh 2004). No state endangered or threatened vascular plant species were identified during this survey per Minnesota's 2013 List of Endangered, Threatened, and Special Concern Species (DNR 2013).
 - Deborah Pomroy conducted a sensitive plant species survey in Sections 3, 4, 9, and 10 of Township 59N and Range 13W in spring 2004 (Pomroy and Barnes 2004). No state endangered or threatened vascular plant species were identified during this survey per Minnesota's 2013 List of Endangered, Threatened, and Special Concern Species (DNR 2013).
 - Gary Walton conducted a sensitive plant species survey in Sections 1, 2, 11, and 12 of Township 59N and Range 13W in spring 2004 (Walton 2004). This survey documented one state endangered plant species, *Caltha natans* (floating marsh marigold). *Caltha natans* was documented in five locations at the Mine Site (Sections 1 and 10 of Township 59N, Range 13W) and in eight locations adjacent to the Mine Site (Sections 1, 11, and 12 of Township 59N, Range 13W) (Table 1). *Caltha natans* was only documented in one location where there will be Project disturbance/construction (Category 2/3 Waste Rock Stockpile) within the Mine Site (Section 1 of Township 59N and Range 13W). Therefore, Barr acknowledged that adverse impacts to this *Caltha natans* population is expected from the Project.
 - Daniel Jones conducted a sensitive plant species survey for *Botrychium* species in Sections 1, 2, 3, 9, 10, and 11 of Township 59N and Range 13W along the internal road network at the Mine Site; and in Sections 1, 9, 10, and 11 of Township 59N and Range 13W along Dunka Road adjacent to the Mine Site (Barr 2007). No state endangered or threatened vascular plant species were identified during this survey per Minnesota's 2013 List of Endangered, Threatened, and Special Concern Species (DNR 2013).
 - Daniel Jones conducted a sensitive plant species survey in Sections 16, 17, and 18 of Township 59N and Range 13W and Sections 13, 14, and 15 of Township 59N and Range 14W along Dunka Road and the proposed pipeline alignment from the west end of the Mine Site to the Plant Site in June and July 2008 (Barr 2012). No state endangered or threatened vascular plant species were identified during this survey per Minnesota's 2013 List of Endangered, Threatened, and Special Concern Species (DNR 2013).

- Midwest Natural Resources Inc. conducted a sensitive plant species survey in Sections 3, 4, 5, and 9 of Township 59N and Range 13W in 2008 (Barr 2011). No state endangered or threatened vascular plant species were identified during this survey per Minnesota's 2013 List of Endangered, Threatened, and Special Concern Species (DNR 2013).
 - Daniel Jones conducted a sensitive plant species survey in Sections 3-10, 14, 15, and 17 in Township 59, Range 14 and Sections 32-34 in Township 60, Range 14W within the Plant Site in 2017 (Barr 2017). The initial survey results identified one state-endangered plant species, *Botrychium ascendens* (upswept moonwort), and one state-threatened plant species, *Botrychium lunaria* (common moonwort). Both *Botrychium* species were documented at the Plant Site (Section 33 of Township 60N, Range 14W). However, the DNR State Botanist determined that the *Botrychium ascendens* was *Botrychium pallidum* (pale moonwort; special concern), and that the *Botrychium lunaria* identification could not be conclusively verified. The survey also identified *Botrychium ascendens* in the processing area (Section 9 of Township 59N, Range 14W). However, the DNR State Botanist determined that the identification could not be conclusively verified. As a result of the survey and the DNR verifications, there were no verified presence of endangered or threatened plant species at the Plant Site per Minnesota's 2013 List of Endangered, Threatened, and Special Concern Species (DNR 2013).
6. In the Work Plan, Poly Met proposed to conduct botanical surveys in accordance with DNR standard guidance. The Work Plan identified threatened and endangered species likely to be found within the Project's area of impact. The DNR approved the Work Plan on May 30, 2018.
 7. Poly Met's contractor conducted the botanical surveys in June 2018. Barr prepared its *Sensitive Plant Species Survey Report* ("Survey Report"), which was submitted to the DNR on August 21, 2018. The report identified the presence of *Caltha Natans*, *Botrychium ascendens*, and *Botrychium spathulatum* (spatulate moonwort) within the Project's area of impact. The DNR approved the Survey Report on October 4, 2018.
 8. The FEIS addressed a range of alternatives, including a no action alternative and other alternatives that were considered but eliminated from detailed consideration. See FEIS, Section 3.0. In the course of this analysis, the FEIS considered impacts to threatened and endangered species, as well as other, related biological resources. *Id.*
 9. On September 25, 2018 the DNR received the Application. The Application includes: a summary of botanical survey work conducted in the vicinity of the Project site; a discussion of the life history, distribution, and habitat of the plant species to be taken; avoidance and minimization measures; a review of the locations of species to be taken; and the proposed mitigation measures. The Work Plan and Survey Report were included as appendices to the Application.

Justification and Scope of Proposed Taking

10. The Project uses the following minimization strategies:
 - minimize the footprint and optimize the placement of mining features;
 - maintain smaller disturbance footprint by re-using existing infrastructure, primarily at the Plant Site;
 - utilize existing facilities and structures, to the extent practicable, to support ongoing activities;
 - maintain future tailings disposal in a limited location within the facility's watershed;
 - install culverts to facilitate flow across wetland areas;
 - control stormwater to prevent site erosion and sedimentation; and
 - collect and treat contact and runoff water as appropriate.
11. The Survey Report documented locations of *Caltha Natans*, *Botrychium ascendens*, and *Botrychium spathulatum*. (See Survey Report, Large Figure 3) More specifically,
 - Within the surveyed area, botanical surveys conducted between 1999 and 2018 documented 14 clusters of *Caltha Natans*. Of these, the Project proposes to take one cluster comprised of 7 individual plants. The remaining 13 clusters are not proposed to be taken.
 - Within the surveyed area, the 2018 botanical survey documented one population of *Botrychium ascendens*. The Project proposes to take this population, comprised of 33 individual plants.
 - Within the surveyed area, the 2018 botanical survey documented one population of *Botrychium spathulatum*. The Project proposes to take this population, comprised of 6 individual plants.
12. The impacts on all of the individual plants of endangered species listed in ¶ 11 will be direct and permanent. There are no indirect or temporary impacts to other individual plants of endangered or threatened species. See Survey Report, Large Figure 3.

Justification for Permit with Compensatory Mitigation

13. *Caltha natans* is an aquatic plant of shallow, slow-moving streams, lakeshores, swamps, and ponds that reaches the southern margin of its continental range in Minnesota's northernmost counties. Despite extensive searches, only 16 populations of the species are known in the state; all are within St. Louis County. These populations typically consist of a number of small clusters of plants within a stream and wetland complex. Over time, these clusters are observed to disappear and arise within the stream and wetland complex. Given its extreme rarity, the species was listed as an endangered species in 1996.
14. *Botrychium ascendens* is a tiny fern that is usually found in the transition areas between forests and meadows or lake shores under a dense cover of grasses, forbs, and small shrubs. In Minnesota, there are 27 known locations of the species in six northern counties. Most locations consist of a small number of individuals. The species' preference for open to partially open habitats makes it vulnerable to the vegetational succession that leads to dense forest in which it cannot survive. Because the species is limited to small populations that are susceptible to habitat loss, it was listed as endangered in 2013.
15. *Botrychium spathulatum* is a small fern of grassy meadows and sand dunes that was first discovered in Minnesota 1998. Since then, it has been identified at a total of only five locations that are widely distributed across northern Minnesota, with each population

NorthMet Mining Project / Findings of Fact & Decision Rationale

comprised of only a few individuals of the species. Given its very limited distribution of small populations that are vulnerable to habitat loss, it was classified as endangered in 2013.

16. Minn. Stat. § 84.0895 and Minn. R. 6212.1800 to 6212.2300 govern the taking of endangered or threatened species in Minnesota. Under this statute and the rules, the DNR may issue permits to applicants authorizing the take of such species under specified conditions.
17. Minn. Stat. § 84.0895, subd. 1, states that “a person may not take, import, transport, or sell any portion of an endangered species of wild animal or plant, ... except as provided in subdivisions 2 and 7.” Subdivision 7 authorizes the commissioner of natural resources to issue permits and prescribe conditions for the taking of endangered and threatened species of animals and plants under any of four conditions, including if “the act enhances the propagation or survival of the affected species” or “the social and economic benefits of the act outweigh the harm caused by it.”
18. Minn. R. 6212.1800, subp. 1 states that “[a] person may not take ... a threatened or endangered species of plant or animal without a permit from the commissioner.” Subpart 2 states that “[a] permit may not be issued unless the commissioner has first determined that the permitted act will not be detrimental to the species.”
19. Minn. R. 6212.2100 states that a permit for the taking of a threatened or endangered species of plant, animal, or insect, may be issued on prescribed conditions when the commissioner has determined that “the permitted act enhances the propagation or survival of the affected species” or “the social and economic benefits of the permitted act outweigh the harm caused by it, provided that the killing of a specimen for these purposes will be permitted only after all other alternatives have been evaluated and rejected.”
20. The DNR has determined that, under some circumstances where compensatory mitigation benefits the species as a whole, it is appropriate to condition a takings permit for a proposed project that involves the take of an endangered or threatened species on compensatory mitigation that provides a net benefit to the species. Consequently, when all other conditions found in statute and rule are met, a taking may be allowed, and where a condition of a permitted take is compensatory mitigation that benefits the species as a whole, a permit can be issued for the take of an endangered or threatened species.
21. The DNR concludes that the Project as currently proposed is a reasonable and necessary action that provides a social benefit in that it is designed and intended to meet the mineral resource needs of the public. The DNR finds that Poly Met has considered and evaluated reasonable alternatives for the Project, resulting in modification to the project to minimize the impact of the Project on three endangered plant species.
22. The DNR has determined that the harm caused to *Caltha natans*, *Botrychium ascendens*, and *Botrychium spathulatum* by the project as currently proposed can be fully mitigated as set forth below.
23. With the implementation of compensatory mitigation as described below, the DNR concludes that the Project as currently proposed will not be detrimental to Minnesota’s populations of *Caltha natans*, *Botrychium ascendens*, and *Botrychium spathulatum*, but will enhance the conservation of the species in Minnesota. In addition, with the implementation of compensatory mitigation as described below, the social benefit of the Project outweighs the harm caused by the taking of the individual plants of an endangered species.

Proposed Valuation of Compensatory Mitigation

24. ***Caltha natans***: The Application summarizes the known distribution of *Caltha natans* in Minnesota. There are 16 known locations of the species in the state, eight of which are in private ownership. One of the locations in private ownership is within the mine site and is proposed to be impacted by the Project.
25. *Caltha natans* is an aquatic plant whose populations typically occurs as a number of clusters of plants within a stream and wetland complex. This is evidenced by the mine site population, where *Caltha natans* occurs as 14 clusters of plants scattered over a large area. One of these clusters of plants is proposed to be taken by the project, while 13 clusters of plants will not be disturbed by the Project. Of these remaining 13 clusters of plants, 11 (79% of the 14 clusters) lie within an area of 280 acres, and 2 clusters of plants are far outside of this 280-acre area.
26. Using the mine site population as a guide, the DNR concludes that the conservation of an entire stream and wetland complex is necessary to achieve the effective conservation of a *Caltha natans* location, and that funding the acquisition of a 280-acre area supporting a currently-unprotected *Caltha natans* location would mitigate the Project's taking of *Caltha natans* and achieve a net benefit for the species.
27. The DNR holds that the valuation of suitable mitigation for the taking of *Caltha natans* by the Project should be based upon the fee title acquisition of a site elsewhere in the state that supports a population of *Caltha natans*, and that is equal in size to the 280-acre area protecting 79% of the *Caltha natans* population in mine site.
28. The University of Minnesota's Land Economics website (landeconomics.umn.edu) is the best available source of estimated land values for Minnesota and was used to estimate the value of the habitat that will be purchased to mitigate the Project's taking of *Caltha natans*. The DNR queried this website for value per acre of land classified as "Class 2b Rural Vacant Land" under state property tax law (per the Minnesota Property Tax Administrator's Manual, July 2015). An analysis of the value of this land class for the period of 2009-2017 in the eastern St. Louis County townships of Bassett, Embarrass, and Fairbanks yields an average value of \$800 per acre.
29. Based upon the available information, the DNR concludes that a defensible mitigation estimate for the taking of *Caltha natans* is (280 acres x \$800/acre =) \$224,000. Compensatory mitigation in the amount of \$224,000 for protecting a currently unprotected population will achieve a net benefit for *Caltha natans*.
30. ***Botrychium ascendens***: The Application summarizes the known distribution of *Botrychium ascendens* in Minnesota. Since there are 27 known locations of the species in the state, the DNR holds mitigation of the proposed taking of *Botrychium ascendens* will be best achieved by conducting surveys or research to benefit this species. The valuation of suitable mitigation for the taking of *Botrychium ascendens* by the Project should employ Minnesota's restitution rules (Minn. R., Part 6133.0060), which place values (\$2,000/individual) on individuals of endangered animal species other than mammals and birds. Using that guidance, while acknowledging that it is intended to be applied to animals rather than plants, compensatory mitigation for the proposed taking is calculated as (33 x \$2,000 =) \$66,000. Compensatory mitigation in the amount of \$66,000 for conducting botanical surveys or research on *Botrychium ascendens* will achieve a net benefit for *Botrychium ascendens*.

31. ***Botrychium spathulatum***: The Application summarizes the known distribution of *Botrychium spathulatum* in Minnesota, and states that only five, widely distributed locations are known in the state. The Application also acknowledges that there are likely additional locations of the species in Minnesota. Given the need for additional botanical surveys for this species, the DNR proposes that the valuation of suitable mitigation for the taking of *Botrychium spathulatum* consist of the cost of one full time surveyor for six months, which is estimated at \$50,000. Compensatory mitigation in the amount of \$50,000 for conducting botanical surveys will achieve a net benefit for *Botrychium spathulatum*.

Based upon the above Findings of Fact, the DNR makes the following:

CONCLUSIONS

32. The DNR concludes, as set forth in ¶¶ 20 through 31, that in order to attain a net benefit to Minnesota's populations of *Caltha natans*, *Botrychium ascendens*, and *Botrychium spathulatum*, it is necessary to condition any takings permit issued under Minn. Stat. § 84.095, subd. 7 on mitigation for that taking. The DNR concludes that compensatory mitigation totaling (\$224,000 + \$66,000 + \$50,000 =) \$340,000, to be used as set forth in ¶¶ 24 through 31, is reasonable.
33. The DNR concludes, as set forth in paragraphs ¶¶ 13 through 31, that pursuant to Minn. Stat. § 84.095, subd. 1 and Subd. 7 and Minn. R. 6212.1800, subp. 1 and Minn. R. 6212.2100 C, the social and economic benefits of the Project as mitigated outweigh the harm caused by the Project to the *Caltha natans*, *Botrychium ascendens*, and *Botrychium spathulatum*, as described herein.

ORDER

Based upon all the files, records, and proceedings in this matter and upon the DNR's Findings of Fact and Conclusions, DNR Endangered and Threatened Species Taking Permit #23235 is hereby issued to Poly Met Mining Inc. subject to the conditions set forth herein and contained in the Permit.

Approved and adopted this 1st day of November, 2018.

STATE OF MINNESOTA
DEPARTMENT OF NATURAL RESOURCES

/s/ Tom Landwehr
TOM LANDWEHR
Commissioner
Minnesota Department of Natural Resources