DEPARTMENT OF NATURAL RESOURCES

Internal Memo – Division of Ecological and Water Resources

Date: 06/28/2021

To: Jill Townley, Supervisor, EWR Environmental Policy and Review Unit

From: Bill Johnson, Mining Planning Director

RE: Cleveland-Cliffs, Inc. and Northshore Mining Company Mile Post 7 Tailings Basin Progression and Clay Borrow Site Environmental Review Need Determination

On December 15, 2020, Cleveland-Cliffs, Inc. through one of its mining subsidiaries Northshore Mining Company (collectively "Proposer"), notified the Minnesota Department of Natural Resources (DNR) of the need to amend the existing Permit to Mine (Permit Amendment) for conducting future operations at its Mile Post 7 Tailings Facility in order to accommodate future tailings generated from processing ore from the Peter Mitchell Mine through the end of the mine's useful life. The proposed amendment includes extending Dams 1 and 2, relocating the materials supply rail line, continued placement of fine tailings into the basin, and development of a new borrow site to supply clay suitable for dam construction (Proposed Project). Extension of the dams and relocation of the rail line will allow the placement of tailings in portions of the basin previously inaccessible because of the existing rail line. The disposal of the tailings in that portion of the basin was covered by the Master Permit originally issued in 1977, and the Permit to Mine originally issued in 1985. No increase in the ultimate dam height of any dams is proposed. The amendment noted preliminary engineering for the proposed tailings basin modifications had been completed to delineate the approximate boundary of the dams, tailings ponds, and material supply railroad. The amendment also identified the existence of several areas on the Proposer's property that would yield clay meeting the specifications necessary for dam construction. *See* ERND Attachment 1: Permit to Mine Amendment. [See Ref. 7].

The DNR is the Responsible Governmental Unit (RGU) for assessing potential State Environmental Review Program requirements for metallic mineral mining and processing projects. *See generally* Minn. R. 4410.0500, subp. 1, Minn. R. 4410.4300, subp. 12, and Minn. R. 4410.4400, subp. 8 (designating DNR as the RGU for metallic mineral mining projects). Minnesota Statute § 116D.04, subd.2a, requires the preparation of an environmental impact statement (EIS) for any proposed metallic mineral project that has the potential for significant environmental effects. A draft EIS was prepared for the Mile Post 7 tailings facility in 1975. This draft EIS together with the Findings, Conclusions and Recommendations from the 1976 "Reserve Mining Company, On-land Tailings

Disposal," were deemed to be the Final EIS on June 2, 1976 (1975-76 EIS). [See Ref. 8 and Ref. 9]. The 1975-76 EIS was prepared jointly by the DNR and the Minnesota Pollution Control Agency (MPCA) on behalf of the State. [*Id*.]

The 1975-76 EIS envisioned and evaluated the entire tailings basin including that portion of the tailings basin subject to the currently proposed Permit to Mine Amendment (Proposed Amendment). The DNR issued a State Master Permit for the Mile Post 7 tailings facility in 1977. At the time of issuance, Reserve Mining Company (Reserve Mining) was not issued separate dam safety permits, nor was it issued a permit to mine, because the implementing dam safety rules and mineland reclamation rules, had not yet been promulgated. Rather a single State Master Permit for all of the tailing's basin attributes was issued for the Mile Post 7 tailings basin. [See Ref. 10]. Part 1.3 of this memorandum provides an overview of the early permitting history for Mile Post 7.

This Environmental Review Need Determination (ERND) analyzes whether further environmental review is required for the Proposed Project before advancing to final permitting and construction. To make this determination DNR must evaluate the 1975-76 EIS together with currently available information, including a prior need determination, in the context of the environmental review requirements set forth in Minn. R. Ch. 4410 to determine the need for additional environmental review for this Proposed Project. This Environmental Review Need Determination replaces DNR's previous determination of April 16, 2017. In making this need determination, the DNR analyzed this project in accordance with the requirements of Minn. R. 4410.1600 (setting forth the factors to consider for preparation of an environmental assessment worksheet) and Minn. R. 4410.3000 (outlining the requirements for a supplemental EIS).

1.0 Currently Permitted Operations

1.1 Existing Tailings Basin

The Proposer operates the Mile Post 7 tailings facility located approximately 5 miles west of Silver Bay, Minnesota (Project). Originally constructed in the late 1970s, the Mile Post 7 tailings basin receives and impounds fine tailings that are a byproduct of processing taconite ore extracted from the Peter Mitchell Mine. Ore from the Peter Mitchell Mine is sent by rail to a processing facility located in Silver Bay, MN (Northshore Silver Bay Operation) where they are concentrated. The waste from the processing is fine tailings that have a particle size similar to talc powder. These tailings are transported as a water slurry by pipeline to the tailings basin where they are pumped to varying locations within the basin's interior. The tailings area currently covers approximately 2,150 acres of land, out of approximately 2,800 total estimated remaining acres permitted for tailings deposition. The railroad is used to transport plant aggregate and filter sands to the tailings basin for ongoing dam construction. The tailings facility also includes an ash landfill, seepage collection ponds, and a water treatment plant among other infrastructure. See ERND Figure 1: Existing Conditions, which also depicts the 1975-76 EIS boundary.

Tailings deposited at the Mile Post 7 site are physically contained by a combination of site topography and three existing dams designated as Dams 1, 2, and 5. Tailings dams are compacted fill embankments continuously constructed (raised and expanded) over the life of the facility, typically beginning with construction of a starter dam with the main dam wall subsequently raised over time. The dams at Mile Post 7 are constructed using the modified centerline or offset upstream method, which is a combination of the upstream and centerline methods. The maximum permitted elevations for the dams and tailings basin were established in the 1977 State Master

Permit. Dam construction began in the late 1970s and has been underway since then. All three dams are classified as Class 1 or High Hazard Dams.

See ERND Table 1: Permitted Dam and Pool Elevations, for permitted current and final elevations (in feet "above mean sea level" or amsl) for the dams and ponds at the site. By definition the permitted ultimate main pond (i.e., basin) elevation is 1,305 ft amsl, while the ultimate dam height elevation is 1,315 ft amsl. The ten foot difference is the freeboard that is maintained to prevent overtopping in the event of extreme precipitation events.

Table 1: Permitted Dam and Pool Elevations (amsl)

Facility Feature	Current Dam Elevation	Ultimate Dam Elevation
Dam 1	1,242 ft	1,315 ft
Dam 2	1,244 ft	1,315 ft
Dam 5	1,255 ft	1,315 ft
	Current Tailings Pond Elevation	**Maximum Tailings Pond Elevation**
Main Pond	1,220 ft	1,305 ft
Reclaim Pond	1,205 ft	1,305 ft

1.2 Regulatory Controls

The Proposer reports that its ongoing operation at Mile Post 7 is currently subject to both federal and state permits and approvals, including but not limited to:

- USACE Permit – Section 404 Clean Water Act, with associated federal regulatory requirements – In progress
- DNR Master Permit – 2019-2023 Five Year Operation Plan – Approved by DNR; includes dam safety requirements
- DNR Permit to Mine – Amendment review in progress; includes Wetlands Conservation Act requirements
- Minnesota Pollution Control Agency (MPCA) – 5 Year Operation Plan (2019-2023) – Approved by MPCA
- DNR Water Appropriation Permit – Complete
- MPCA Air Permit – Complete
- MPCA Permit by Rule (PBR) landfills – Planned for future
- MPCA SW – 409 Permit – Planned for future
- MPCA 401 Certification – Review in progress

- MPCA Construction Stormwater Permit – Planned for future
- Northshore Stormwater Pollution Prevention Plan (SWPPP) – Planned for future
- MPCA NPDES/SDS Permit MN0055301 – Reissuance in progress

1.3 Key Milestones

Proposed operations at Mile Post 7 underwent extensive litigation, ending in 1975, in both federal and state courts challenging Reserve Mining's ongoing tailings discharge into Lake Superior and emissions of particulate matter from its at Silver Bay facility. Once the litigations were complete, the project received numerous permits and approvals as well as underwent changes in ownership. Detailing the entire chronological history of the issues and litigation is beyond the scope of this ERND. Below is a partial listing of key milestones for Mile Post 7.

1956	Reserve Mining Company began full operations at its Silver Bay taconite processing plant.
June, 1973	Reserve Mining Company's discharge to Lake Superior identified as source of asbestiform fibers in Duluth, Minnesota's, drinking water.
November, 1974	Reserve Mining Company submitted permit applications to the DNR and MPCA to build an on-land tailings basin at Mile Post 7.
May, 1975	Minnesota Environmental Quality Council notified DNR and MPCA as being designated as joint responsible agencies for preparation of an Environmental Impact Statement for Reserve Mining Company's Mile Post 7 plan.
October, 1975	DNR and MPCA issued the Draft Environmental Impact Statement for Reserve Mining Company's Proposed On Land Tailings Disposal Plan.
June, 1976	DNR deems Final Environmental Impact Statement for Reserve Mining Company's Proposed On Land Tailings Disposal Plan to be complete.
March, 1977	US Army Corps of Engineers releases Final Environmental Impact Statement for Power Plant Discharge Structure, Delta Stabilization Dike, and On-Land Taconite Tailings Disposal for Reserve Mining Company.
August, 1977	DNR issues a Master Permit to Reserve Mining Company for the Mile Post 7 On Land Tailings Disposal Plan at Silver Bay, Minnesota.
April, 1978	MPCA issues its permits for construction and operation of a disposal system (i.e., Mile Post 7).
February, 1981	Reserve Mining Company submits an Application for a Permit to Mine to DNR.
May, 1984	MPCA issues NPDES Permit MN0055301 to allow a discharge from Mile Post 7.
March, 1985	DNR issues a Permit to Mine to Reserve Mining Company Peter Mitchell Mine and Stockpiles, Reserve Railroad, E.W. Davis Works, and Milepost 7 Tailings Basin Site.
August, 1986	Reserve Mining Company filed for bankruptcy under Chapter 11.

August, 1989	Master Permit transferred to Cyprus Mineral Company.
August, 1989	NPDES Permits (x3) transferred to Cyprus Mineral Company and Cyprus Northshore Mining Company.
September, 1994	Cleveland Cliffs purchases Cyprus Mineral Company.
January, 1995	MPCA issues Air Emission Permit No. 07500003 as a Total Facility Operating Permit.
August, 1995	Master Permit renewal by DNR to Cleveland Cliffs.
September, 1996	MPCA combines three water quality permits into NPDES/SDS Permit No. MN0055301.
October, 2004	DNR assigns Cleveland Cliffs and Northshore Mining Company to the Permit to Mine.

As previously noted, the history around Mile Post 7 is extensive. This listing provides background information as context for the ERND. There have been numerous permit amendments, renewals, and re-issuances since assignment of the original permit actions. Where relevant, this is noted in the ERND.

2.0 Description of Proposed Project

DNR has identified the following set of proposed actions as constituting the Proposed Project requested with the Permit to Mine Amendment that should be evaluated to determine if further environmental review is required.

2.1 Extension of Dams 1 and 2

The Proposer intends to extend the western ends of Dams 1 and 2 to allow continued placement of tailings in the Mile Post 7 facility over the remaining permitted life of the Peter Mitchell Mine. No changes to Dam 5 are proposed. Presently 10,000 ft long, the Dam 1 extension adds 8,100 ft of new dam, principally designed to prevent tailings from being deposited on the existing ash landfill. Dam 2 is currently 6,000 ft long and is proposed to be extended an additional 4,100 ft. Similar extensions to Dams 1 and 2, which included a proposed 50-foot increase in the ultimate dam height to 1,365 ft amsl, were evaluated in 2016-17 for potential State Environmental Review and permitting requirements but were not implemented. The current amendment does not propose to change the ultimate dam height for either Dam 1 or 2; these will remain at 1,315 ft amsl as currently permitted. See ERND Figure 2: Proposed Dam Extensions.

2.2 Progressing the Area of Tailings Deposition

The Proposer intends to continue placing tailings into the Mile Post 7 facility. The currently permitted basin is 2,800 acres of which 2,150 acres have been covered to date. The Proposed Project would involve the placement of tailings in the final 650 available acres of the basin, which means the tailings footprint would continue to increase until the maximum basin elevation of 1,305 ft amsl is reached. This remaining unfilled portion of the tailings basin is west of the current location of the West Ridge Railroad; this is because the eastern and southern boundaries of the tailings deposition footprint is already physically established by local topography and operations conducted to date. Although the depth of new tails would vary according to where it is measured, much of the site would receive up to approximately 60 ft of new tails over the remaining life of the Peter Mitchell Mine. There

is however a 550-acre area in the northwest part of the basin, located inside the proposed relocated West Ridge Railroad, which would not have tailings build-up because the natural topography of the area is above 1,315 ft amsl. See ERND Figure 3: Proposed Tailings Progression.

2.3 Westward Relocation of the West Ridge Railroad

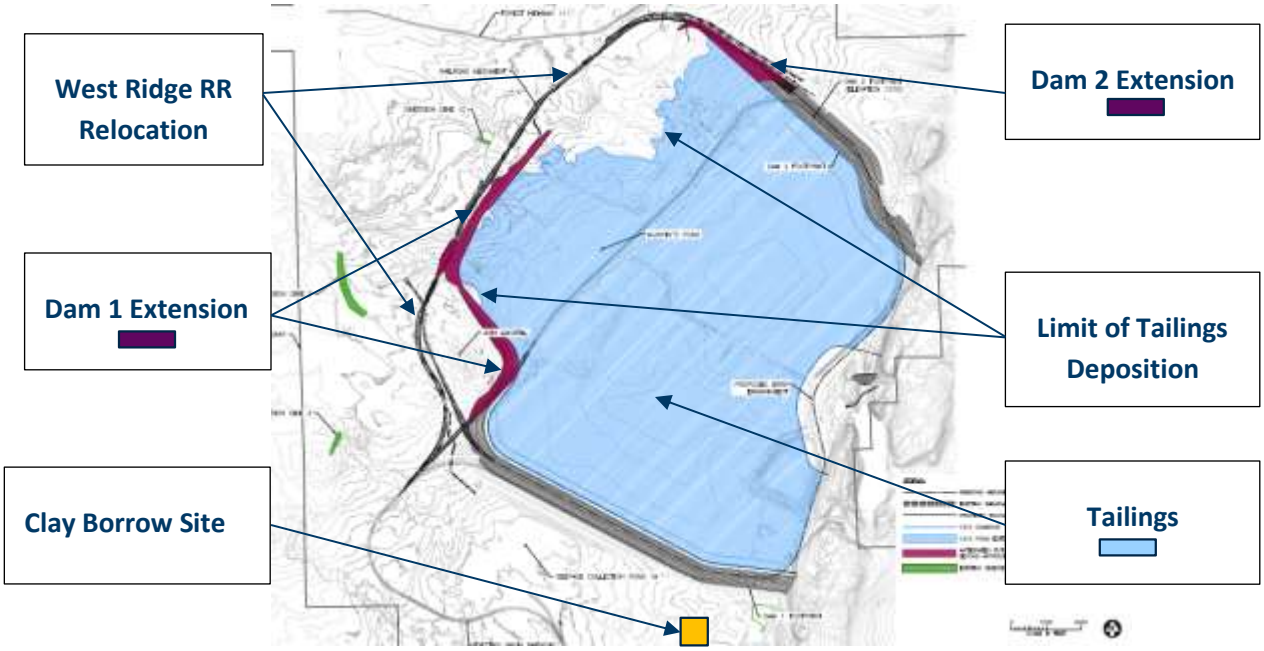
In order to use the remaining portion of the basin, the West Ridge Railroad line and corridor will need to be relocated. The relocated corridor would be placed approximately 4000 ft to the northwest of the existing rail line at an elevation above 1,315 ft amsl. This would allow the placement of tailings over the present rail corridor into the remaining 650 acres of the tailings basin. The majority of new railway embankment construction would occur separate and outside the extended dam footprints, although the new railway embankment would be constructed on a small section of the Dam 1 extension, while abutting the entire length of the Dam 2 extension. The relocated railway would be inside the existing diversion ditches that were designed and constructed at the western limit of the tailings basin permit boundary. The new railway, as does the existing railway, would be used to supply plant aggregate and filter sands as construction materials for ongoing development of the dams. The railroad has no structural function in entraining tailings; that is reserved for the dams. See ERND Figure 4: Proposed Railroad Relocation.

2.4 Development of a New Clay Borrow Site

The Proposer intends to extract clay material for ongoing construction of Dam 5 from a clay borrow pit developed on approximately 100 acres of company-owned property located south of the basin. Although no changes are proposed to Dam 5, its construction includes a clay core that requires a steady source of compatible clay materials for continued construction. [See Ref. 24 at 2]. The Proposer reports some clay removal activity has already occurred at the site, but the need for a continuous source of suitable clay as a construction material would be addressed with this part of the proposal. Once clay removal ceases, the area would be reclaimed, principally as a function of the depth of the extracted resource and whether bedrock was exposed. See ERND Figure 5: Borrow Area.

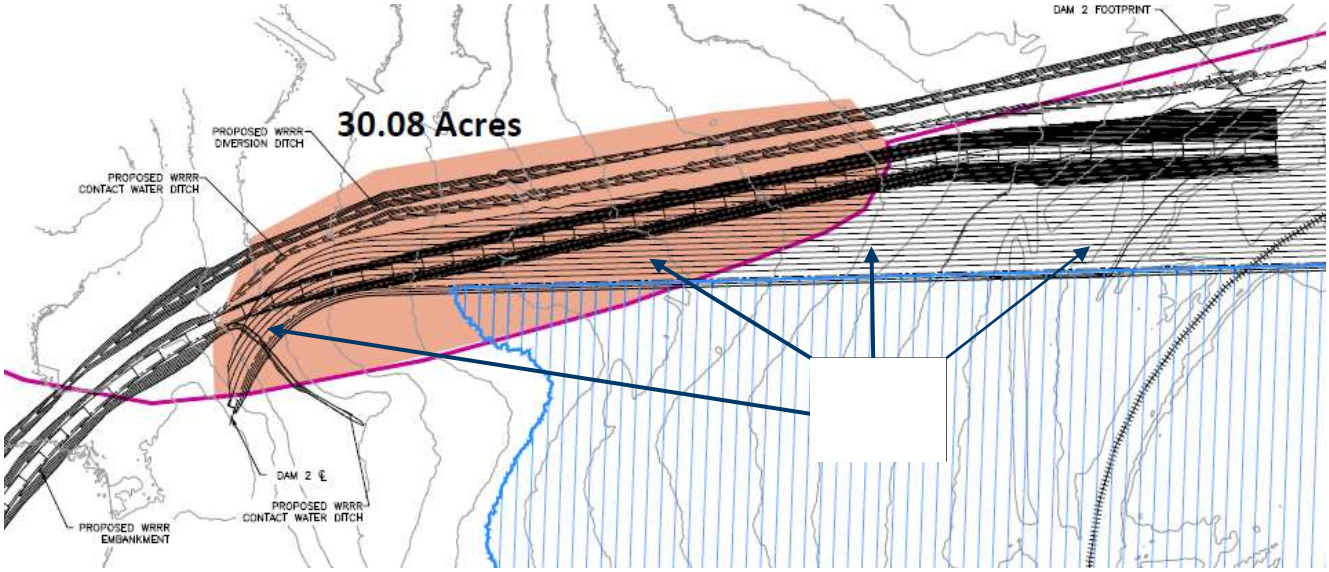
2.5 Visual Summary of the Proposed Project

The image below illustrates the Proposed Project covered by the proposed Permit to Mine Amendment.



2.6 Proposed Permit to Mine Amendment – New Acreage and Activity

The Permit to Mine Amendment also addresses those parts of the proposed dam extensions, and realignment of the West Ridge Railroad, that fall outside the current Permit to Mine area of disturbance boundary that was assessed in the 1975-76 EIS. The Proposer's summary indicates 30.08 acres of construction for Dam 2 would fall outside of the EIS study area and current permitted area of disturbance boundary; this is a preliminary estimate and would be subject to review in the Permit Amendment process. The Proposer reports the new development and impacts are required to meet the safety requirements for the railroad's curvature and percent grade over the north and west ends of Dam 2. As part of Dam 2 itself, this area is not to be covered with tailings and thus does not expand the tailings footprint beyond the maximum remaining estimated 2,800 acres already permitted. In addition, approximately 100 acres are associated with the proposed clay borrow site, which would also be evaluated under the Permit Amendment. See ERND Figure 6: New Dam 2 Construction Area.



2.7 Summary

The Proposed Project enables continued placement of tailings at the Mile Post 7 facility over the remaining operating life of the Peter Mitchell Mine. The Permit Amendment is limited to the extensions of Dams 1 and 2, the retirement and relocation of the West Ridge Railroad, continued progression of the tailings inundation area, and development of a new clay borrow site. No increase in final dam height is proposed, and no other changes to the tailings facility are proposed. There is no proposal to alter tailings production or deposition rates from current operations. If approved, the Permit to Mine area of disturbance boundary would likely need to be adjusted to accommodate dam construction, a small part of the West Ridge Railroad corridor, and the new clay borrow site. Review procedures under the Permit to Mine Amendment process will determine the final acreage potentially impacted by future development located outside the current area of disturbance boundary.

3.0 Applicable Minnesota Rules (Chapter 4410)

Minnesota Statute § 116D.04, subd. 2a, requires the DNR to undertake environmental review for projects that have the potential for a significant effect on the environment. Where environmental review in the form of an EIS has previously been completed and the project constructed, the DNR may be required to conduct supplemental environmental review in accordance with the requirements of Minn. R. 4410.3000, subp. 3B. The following provisions of Minn. R. Ch. 4410 are potentially applicable to the Proposed Project:

- Part 4410.0200, subpart 65 – Definition of Project
- Part 4410.4600, subpart 2 – Standard Exemptions
- Part 4410.4400, subpart 8B – Metallic Mineral Mining and Processing
- Part 4410.4300, subpart 11B – Metallic Mineral Mining and Processing
- Part 4410.3000, subpart 3C – Supplementing EIS, Phased and Connected Actions
- Part 4410.3000, subpart 3B – Supplementing EIS, Ongoing Governmental Action

3.1 The Proposed Project is a Project within the Meaning of Minnesota Rules 4410.0200, subp. 65.

Minnesota Rule 4410.0200, subp. 65, defines “project” as “a governmental action, the results of which would cause physical manipulation of the environment, directly or indirectly. The determination of whether a project requires environmental documents shall be made by reference to the physical activity to be undertaken and not to the governmental process of approving the project.”

As more fully described in Part 2.0 in this Determination, the Proposed Project would cause physical manipulation of the environment, through construction of the two new dam extensions, retirement/relocation of the material supply railroad, and developing the clay borrow site. An amendment to the Permit to Mine is required before the Proposed Project can proceed. Other permits and approvals are also required before the Proposed Project could proceed. Consequently, the Proposed Project is a “project” within the meaning of Minn. R. 4410.0200, subp. 65.

3.2 The Proposed Project Does Not Qualify for an Environmental Review Exemption.

Minnesota Rule 4410.4600 describes those types of projects that are exempted from environmental review. There are five standard exemptions that permit projects to be exempted from environmental review. See Minn. R. 4410.4600, subp. 2A—E. The application of these standard exemptions are analyzed below:

A. Projects for which no governmental decision are required: As outlined in Part 1.2 of this Determination, there are numerous federal and state permits required for this Proposed Project and, therefore, this exemption does not apply.
B. Projects for which all governmental decisions have been made: As outlined in Part 1.2 of this Determination, there are federal and state permits that have not begun, or are in progress, that must be completed prior to Proposed Project implementation and construction, therefore, this exemption does not apply.
C. Projects for which, and so long as, a governmental unit has denied a required governmental approval: The Proposer has not notified DNR, nor is DNR aware, of any denial of any required governmental approval(s), therefore, this exemption does not apply.
D. Projects for which a substantial portion of the project has been completed and an EIS would not influence remaining construction: Construction has not commenced on the Proposed Project, therefore, this exemption does not apply.
E. Projects for which environmental review has already been completed or for which environmental review is being conducted pursuant to part 4410.3600 or 4410.3700: The extensions of Dams 1 and 2, retirement/relocation of the West Ridge Railroad, and clay borrow site constitute changes to the Mile Post 7 Project that were not evaluated in the 1975-76 EIS, nor have been subject to subsequent environmental review, therefore, this exemption does not apply.

Additionally, Minn. R. 4410.4600, subp. 8, exempts mining projects from environmental review if the proposed project "do[es] not result in permanent alteration of the environment," if it is an "[e]xpansion of metallic mineral plant processing facilities that are capable of increasing production by less than 10% per year," or it is a "scram mining operation."

As outlined in Part 2.0 of this Determination, the Proposed Project will result in a permanent alteration of the environment, but does not expand the taconite ore processing facilities at Silver Bay. The Proposed Project also does not constitute a scram mining operation as defined in Minn. Stat. § 93.46, subd. 10. Therefore, the Proposed Project does not meet the requirements for the subpart 8 mining exemption.

Having failed to meet any of the exemption qualifications of Minn. R. 4410.4600, subp. 2 or subp. 8, the Proposed Project is not exempt from environmental review.

3.3 Application of the Metallic Mineral Mining and Processing Mandatory EIS Category Requirements to the Proposed Project.

Minnesota Rule 4410.4400, subp. 8B, requires DNR to prepare a mandatory EIS "for construction of a new facility for mining metallic minerals or for the disposal of tailings from a metallic mineral mine."

As outlined more fully in Part 2 of this Determination, the Proposed Project does not involve construction of a new tailings facility. The tailings basin in total was analyzed in the 1975-76 EIS, and subsequently permitted in 1977 and 1985 respectively. The Proposed Project modifies the previously permitted Dams 1 and 2, and removes and reconstructs the existing West Ridge Rail line, to permit the remaining 650 acres of the basin to be used for tailings storage. The Proposed Project, if permitted, would allow tailings to be deposited in this acreage to the final basin elevation of up to 1,305 ft amsl, which allows for ten feet of freeboard for Dams 1, 2, and 5. Because the Proposed Project is the modification of an existing tailings basin that was subjected to environmental review in the 1975-76 EIS, it is not a new project within the meaning of Minn. R. 4410.4400, subp. 8B.

3.4 Application of the Metallic Mineral Mining and Processing Mandatory EAW Category Requirements to the Proposed Project.

Minnesota Rule 4410.4300, subp. 11B, requires DNR to prepare a mandatory Environmental Assessment Worksheet (EAW) "[f]or [the] expansion of a stockpile, tailings basin, or mine by 320 or more acres." This rule presents two separate criteria that must be met for a mandatory EAW: (1) whether the Proposed Project is an expansion; and (2) whether the Proposed Project is 320 acres or more.

3.4.1 Expansion Threshold Test

3.4.1.1 Definition of Expansion

To determine whether a mandatory EAW must be prepared for the Proposed Project, the DNR must first determine whether the Proposed Project is an expansion of the permitted operational storage capacity at Mile Post 7, which in this instance includes consideration of information generated from the 1975-76 EIS, as well as conditions of the 1977 State Master Permit and 1985 Permit to Mine. The term expansion is defined as "an extension of the capability of a facility to produce or operate beyond its existing capacity. It excludes renovations or repairs that do not increase the capacity of the facility." See Minn. R. 4410.0200, subp. 28. The term "extension" used in the cited rule is not defined.

The term "extension" is defined in Merriam Webster as "an enlargement in scope of operation," and the Oxford English Dictionary defines the term extension as "a part that is added to something to enlarge or prolong it, a continuation."

It is in light of these definitions that the DNR has evaluated whether the Proposed Project constitutes an expansion of the permitted operational tailings storage capacity at Mile Post 7.

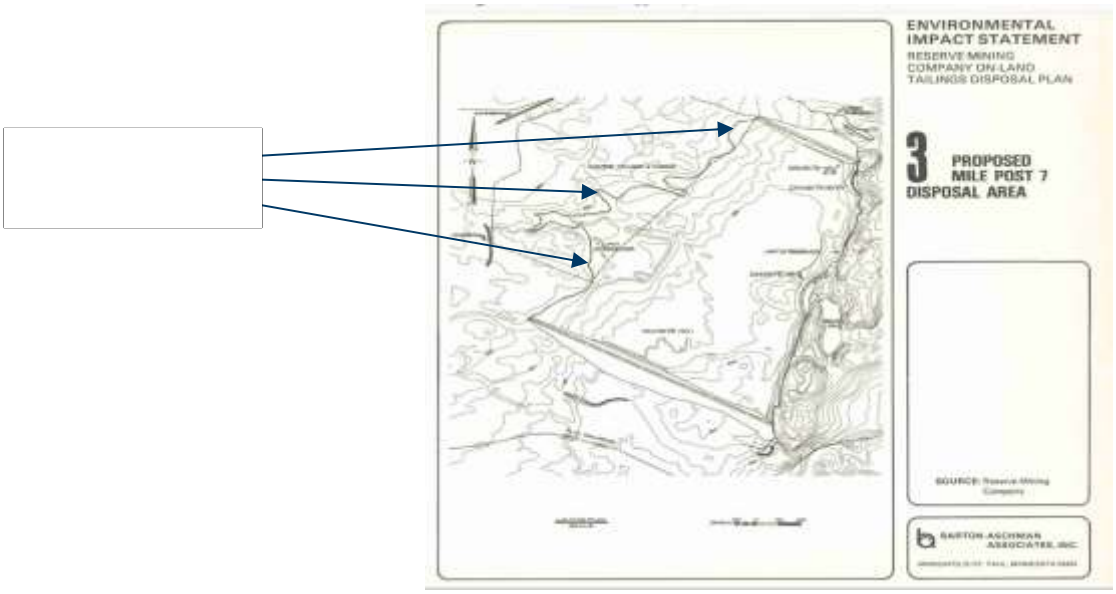
3.4.1.2 Ultimate Dam Height

One way to analyze whether the Proposed Project constitutes an expansion is to determine whether the Proposed Project changes the tailings basin footprint. The tailings basin footprint at Mile Post 7 is determined by both the deposition area and dam height(s), which is well documented from the EIS to present for Mile Post 7. The 1975-76 EIS assumed the heights and lengths of the dams would change over time as more tailings were deposited onsite. This required specifying the height and length of the dams at the end of the tailings basin's designed or useful life to appropriately assess project-related impacts.

3.4.1.2.1 Ultimate Dam Height Specified in the 1975-76 EIS and Subsequent Permits

A tailings basin is an impoundment designed to store tailings generated from the processing of ore. As explained in Part 1.1 of this Determination, the footprint of tailings entrainment at the Mile Post 7 tailings basin is controlled by site topography and three dams. For any tailings basin, the height of the dam(s) is dictated by the depth and volume of tailings that will be stored in the basin plus allowing for 10-feet of freeboard (for this facility). For Mile Post 7, this is typically reported as the dam height elevation in feet above mean sea level (i.e., ft amsl). Freeboard is defined as the vertical distance between the top of the dam and the full fill level of the reservoir, or in this case "basin." Ten feet of freeboard is necessary to accommodate increases in basin elevation associated with extreme precipitation events. The ultimate or final dam height coupled with site topography dictates the ultimate extent of where tailings will flow and settle within the basin.

- 1975 Draft EIS. The final dam height evaluated in the 1975 Draft EIS was 1,280 ft amsl. This was conceptually depicted in EIS Figure 3: Proposed Mile Post 7 Disposal Area. See the image below; also see ERND Attachment 3: EIS Figure 3. [*Id*. at 21, 35].



- 1976 Final EIS. Findings 10 through 14 from the Administrative Hearing (following development of the Draft EIS) is the "Description of Proposal." Finding 12 addresses the specifications for the dams, including construction specifications and height. Finding 12 provides:

  "The proposed tailings basin would require construction of four dams, *the designs for which have been substantially modified since the preparation of the draft environmental impact statement*. The south dam [Dam 1], the largest structure in the plan was originally designed to be about 12,600 feet along and about 150 feet high. *The most recent modifications would increase the length to nearly 14,000 feet and the height to about 180 feet*. The north dam [Dam 2] as originally designed would have been 5,200 feet long and about 120 feet high, the Bear Lake dam [Dam 5] 2,800 feet long and about 130 feet high, and the northeast saddle dam 1,700 feet long and about

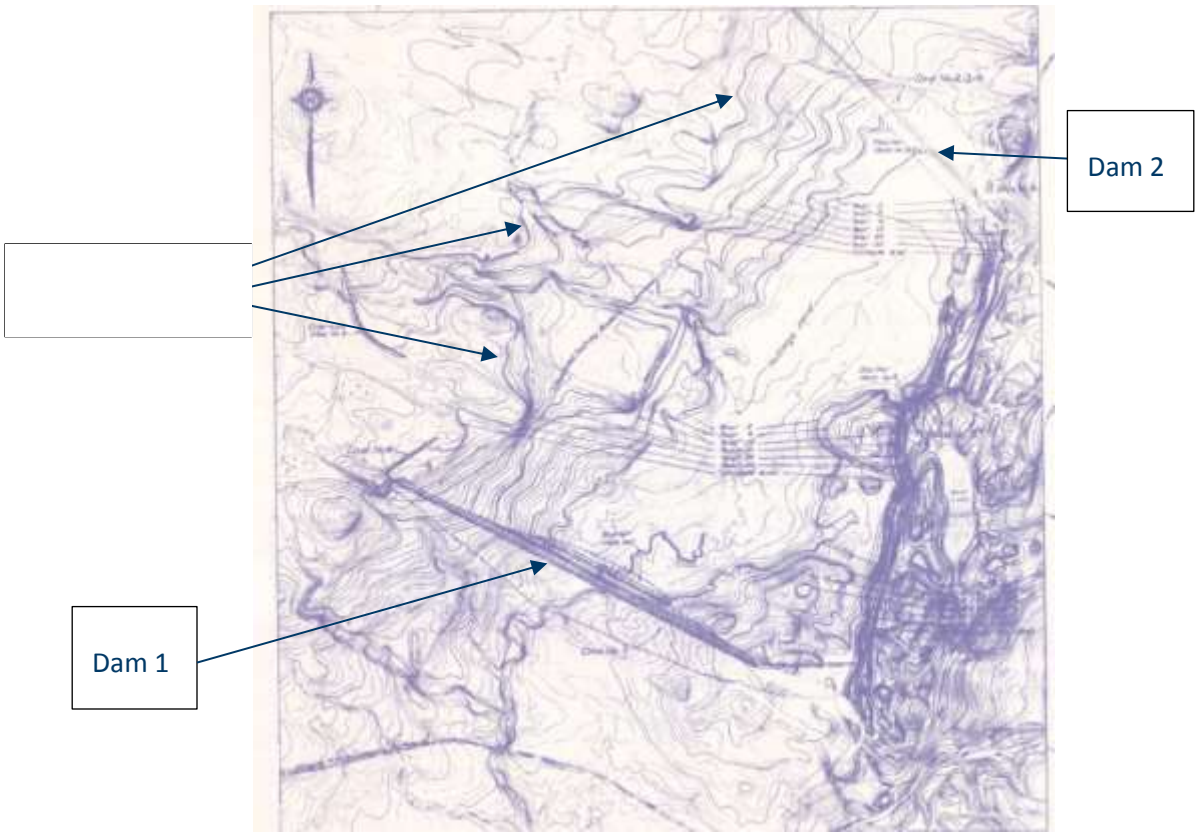
80 feet high. *The modified design would require comparable increase in the height and some adjustment in the length of these dams*. In addition, seepage recovery dams, diversion dikes and saddle dikes would be constructed." [See Ref. 9; Admin. FOF at ¶ 12 at 8]. (Emphasis added).

These modifications to dam height equate to about 30 feet, meaning the ultimate dam height under consideration by the end of environmental review was 1,310 feet amsl. As relayed in other findings, the principal reason for these and other project modifications made during environmental review was to address potential adverse air effects, especially around fugitive dust emissions that included fibers. [*Id*.; Admin. FOF at ¶ 47 at 16]. There are no figures from the Administrative Hearing showing this modification in final dam height by approximately 30 ft.

- 1977 Master Permit. The DNR 1977 Master Permit regulated "the Mile Post 7 tailings disposal system and related facilities including work on the tailings delta in Lake Superior." [See Ref. 10]. Section V of the 1977 Master Permit addressed the "Tailings Containment Dams," and specifies:

    - "Dams 1 and 2-3…will be constructed to ultimate crest elevation 1,315 mean sea level, over a period of years, according to a predetermined construction schedule.
    - Dams 4, 5, and 6 are proposed to be constructed to ultimate crest elevation 1,315 mean sea level."

  Issuance of the 1977 Master Permit set the final dam height at 1,315 ft amsl, which is consistent with the height specified, assessed, and considered in the 1975-76 EIS. [Id. at 12-13]. The dam height is equal to the maximum tailings elevation at 1,305 ft amsl plus ten feet of freeboard to ensure adequate pool capacity to handle both the total tailings at the end of project life, plus water from an extreme precipitation event. Mile Post 7 began accepting tailings (principally for dam construction) after issuance of the 1977 Master Permit. Engineering Design Figure C-18 (August 1976) captures the anticipated tailings elevations over the expected operational life of the facility. See the image below; also see ERND Attachment 4: Engineering Design Figure C-18.



- 1985 Permit to Mine. As directed by the Mineland Reclamation Act, the DNR promulgated Minn. R. Ch. 6130 in 1980. In 1981 Reserve Mining submitted an application for a Permit to Mine covering Reserve's mining, processing, and tailings disposal basin. [See Ref. 27]. DNR issued a Permit to Mine on March 1, 1985. [See Ref. 11]. Section 6 of Reserve Mining's permit application states that at closure of the Mile Post 7 tailing's basin:

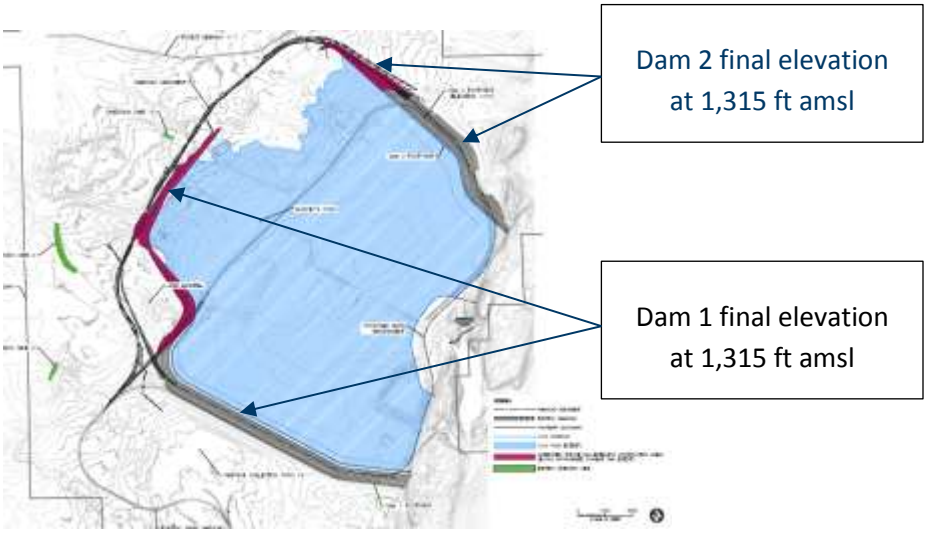
  "[T]he free water pond will be reduced in volume and area concurrently with placing the seeding of the coarse tailing topping layer. The result will be a large meadow with one or more small ponds, and the entire area protected at the extremities by the tailings dams standing several feet above the general level. *The average level in the ultimate tailing pond area will be about elevation 1,305 while the dam crests* [height] *will be elevation 1,315*." [See Ref. 27 at 48]. (Emphasis added).

  Therefore issuance of the 1985 Permit to Mine also set the final dam height at 1,315 ft amsl. The dam height presumed a final basin area elevation of 1,305 ft amsl and 10 feet of freeboard for managing extreme precipitation events. These values are consistent with the dam height and related elevations evaluated in the 1975-76 EIS.

3.4.1.2.2 Ultimate Dam Height Specified for the Proposed Project

The Proposer's current request for a Permit to Mine Amendment does not propose a change to the currently permitted final dam height of 1,315 ft amsl that was set in the 1975-76 EIS, 1977 Master Permit, and 1985 Permit to Mine. The current amendment request still presumes a 1,315 ft amsl final dam height, and a 1,305 ft. amsl

final tailings basin elevation at the close of operations allowing for 10 feet of freeboard. The image below shows the existing and proposed dams at the 1,315 ft amsl contour, which is slightly higher than tailings would actually cover; also see ERND Figure 2: Proposed Dam Extensions.



Conclusion. Thus there is no change in the final dam or basin elevations, and therefore there is no expansion in the height of the tailings basin or dams within the meaning of Minn. R. 4410.4300, subp. 11B.

3.4.1.3 Estimated Storage Volume and Remaining Capacity

As indicated above, the final dam height elevations are the principle factor controlling how much tailings can be stored at Mile Post 7. The 1975-76 EIS and 1977 Master Permit also included estimates of the total tailings storage volume of Mile Post 7. Comparison of storage capacity used to date, plus the remaining capacity of the basin covered by the Proposed Project, supports the conclusion that the Proposed Project does not represent an expansion or extension of Mile Post 7.

3.4.1.3.1 Estimated Storage Capacity Specified in the 1975-76 EIS and Subsequent Permits

The 1975-76 EIS assumed 20,417,000 long tons of tailing slurry would be pumped annually into the Mile Post 7 tailings basin over the 40-year operational life of the Project. This amounts to a total volume of 816,680,000 long tons of tailings slurry being sent to the tailings basin over the life of the project. [See Ref. 8 at 17]. Although not directly comparable to the 1975-76 EIS estimate, the 1977 Master Permit identified the facility would eventually store 733,000,000 long tons of "fine and coarse tailings. [See Ref. 10 at 14].

3.4.1.3.2 Estimated Remaining Storage Capacity for the Proposed Project

Tailings Production to Date. DNR requested that the Proposer provide information around fine tailings slurry production to date, which can be directly compared to the 1975-76 EIS estimate. The Proposer reports that actual tailings production has not met original projections of ~20 million long tons per year. From 1985 to 2005, the slurry production rate ranged from ~4.0-5.3 million long tons per year, with an estimated 88,736,000 long tons of fine tailings deposited over the period. Since 2005 to the present, production ranged from ~5.5-7.9 million long

tons per year with ~102,383,000 long tons of tailings placed in the basin. When aggregated to the present, the Proposer estimates that only 191,118,000 long tons of tailings have been deposited to date at Mile Post 7.

Remaining Available Storage. DNR also requested for the Proposer to provide an estimate for the remaining fine tailings storage capacity at the tailings facility. The Proposer estimates the remaining storage capacity, assuming a 1,315 ft amsl final dam height, to be 561,905,000 long tons of tailings. This makes the updated total estimated capacity of fine tailings volume at Mile Post 7 to be 753,023,000 long tons of tailings slurry.

Conclusion. It is not unexpected that the 1975-76 EIS and 1977 Master Permit numbers differ from today's numbers. The historic numbers represent pre-construction estimates. Unlike the past estimates, current estimates of tailings deposited to date and remaining basin capacity were calculated using actual disposal data and Lidar-based modeling. The Lidar-based modeling was used to calculate the remaining volume in the tailings basin from May 2019 to the permitted final dam height of 1,315 ft amsl. Comparing the values, the original 1975-76 EIS estimate of ~820 million long tons of capacity in the basin is greater than the current estimated total volume of ~750 million long tons of tailings capable of being stored in the basin. Thus from a volume perspective, absent any proposed change in the maximum dam height, there is no is no expansion of the tailings basin within the meaning of Minn. R. 4410.4300, subp. 11B.

3.4.2 Acreage Threshold Test for an EAW

Finally Minn. R. 4410.4300, subp. 11B, provides that an EAW is required for the expansion of a tailings basin that is 320 acres or more. To assess whether this threshold has been met the DNR must assess the area of the tailings basin examined in the 1975-76 EIS and permitted in the 1977 Master Permit, as compared to any increase in acreage proposed in the requested Permit Amendment currently pending before the DNR.

3.4.2.1 Projected Extent of Tailings Deposition in the 1975-76 EIS

The total proposed tailings disposal area for the Mile Post 7 site analyzed in the 1975-76 EIS was 7.6 square miles, of which approximately 4.6 square miles were designated for fine tailings disposal. [See Ref. 8 at 18]. The total project area is detailed in 1975-76 EIS Figure 16: Proposed Mile Post 7 Plan, Tailings Basin, and Ancillary Facilities. This was the area assessed for potential impacts in the 1975-76 EIS. See the image below, which is ERND Attachment 2: Draft EIS Figure 16. [*Id.* at 18, 42].

The 1975-76 EIS estimated the area covered by fine tailings (i.e. the tailings basin) over the life of the project would be 4.6 square miles, or approximately 2,950 acres. This was the size of the basin studied in the 1975-76 EIS and ultimately permitted. Based on Lidar-based imagery, the Proposer provided an updated estimate that indicates the tailings basin will cover approximately 2,800 acres at the end of its useful life, when tails in the basin reach the elevation of 1,305 ft. amsl.

As will be discussed below, the Proposer began filling the Mile Post 7 basin from east to west. A temporary rail line was placed running from north to south approximately midway through the permitted basin footprint to facilitate transport of construction materials for Dams 2 and 5. Because of the topography and placement of the dams, the Proposer used the eastern half of the permitted basin area first that allowed the rail line to supply dam construction materials along the western border of the tailings. By 2005 the used portion of the tailings basin covered up to ~1,680 acres. Since then, the used portion of the Mile Post 7 tailings basin increased to currently cover ~2,150 acres, which is still less than the planned capacity of 2,950 acres for the entire tailings basin evaluated in the 1975-76 EIS.

3.4.2.2 Direction of Tailings Progression

Tailings basins are designed to accommodate tailings production over extended periods of time, often over the multiple decades it takes to fully mine a mineral deposit. Consequently, the tailings footprint within the basin changes as tailings are delivered for storage at the site. The perimeter or extent of a tailings basin footprint is established by both site topography and dam elevations. Generally, the lowest parts of a basin will fill first, with the depth and area covered by tails changing over time as more tails are deposited. The planned and real change in the area covered by tailings is referred to as the tailings "progression." The tailings basin's depth and shape can also be influenced over time by features within the basin, such as existing topography and deposition planning (i.e. where tails are first placed). Simultaneously, the dam heights must also change over time to accommodate the volume of tailings that a basin is ultimately designed to accommodate.

At Mile Post 7, the combination of "high" site topography and Dam 5 on the east, and the continued construction of Dams 1, 2, and 5 to the south, north, and east, has caused tailings to "spread" or progress westward over time. This is expected to continue under the Proposed Project. The westward tailings progression of the total area covered with tailings in the basin is shown on the images below.

Westward Tailings Progression Over Operational Period

Circa 1985 to 2005	2005 to Present	Present Going Forward	1975-76 EIS
Approximate Initial Basin Area = 1,680 acres	Approximate Current Basin Area = 2,150 acres	Approximate Final Basin Area = 2,800 acres	Approximate Final Basin Area = 2,950 acres
			

3.4.2.3 Previous Relocation of the West Ridge Railroad

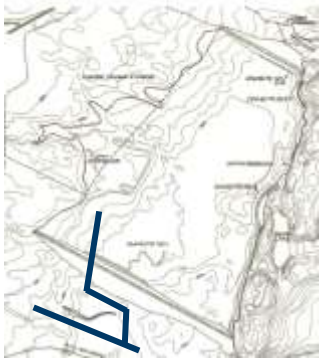
The 1975-76 EIS generally noted that the coarse tails required for dam construction would be delivered to the Mile Post 7 basin by means of Reserve Mining's existing mining railroad; see ERND Attachment 5: Possible Railroad Spur. [See Ref. 8 at 42]. It was eventually decided to provide rail access to Dams 2 and 5 to convey construction materials (i.e., coarse tails) to both dams via the "West Ridge Railroad." Of note the rail line itself is not an impoundment structure; that is reserved for the dams. Because tailings were first placed on the eastern portion of the basin, this line traversed the planned basin along the western periphery of the initial tailings deposition area. As the initial area of tailings deposition advanced westward, in 2005 it was necessary to move the West Ridge Railroad approximately 1000-2000 ft west from its original alignment to its current location. Since then, continued progression of tailings deposition to the west has resulted in the current proposal to relocate the West Ridge Railroad a second time to facilitate tailings deposition to the tailing basin's designed capacity, which is set by the planned maximum dam height of 1,315 ft amsl (remembering that the dam height is the basin elevation + freeboard).

The shifting position of the West Ridge Railroad to the west over time is detailed in the images below.

Shifting Position of West Ridge Railroad Over Operational Period

Original RR Line	RR Line Relocation #1	RR Line Relocation #2	Potential RR Spur
Circa 1985 to 2005	2005 to Present	Present Going Forward	1975-76 EIS w/Spur



Conclusion. In short, the Mile Post 7 tailings basin was designed to cover 2,950 acres. This is the Project that was studied in the 1975-76 EIS. The area covered by the tailings basin at the end of its useful life will be a projected 2,800 acres, or 150 acres less than the basin that was evaluated in the 1975-76 EIS. It cannot be said, therefore, that there will be a 320-acre expansion of an existing tailings facility such that an EAW is required.

The Permit Amendment does result in an increase in the dam footprint area, but not for purposes of increasing the extent of the tailings basin because the area of tailings authorized for placement will remain the same. The requested new acreage, which is estimated to be approximately 30 acres, is for the sole purpose of accommodating necessary construction on Dam 2 and relocation of the rail line.

3.4.3 EAW Need Determination

Minnesota Rule 4410.4300, subp. 11B, requires DNR to prepare a mandatory Environmental Assessment Worksheet (EAW) "[f]or [the] expansion of a stockpile, tailings basin, or mine by 320 or more acres." For the Mile Post 7 tailings basin, the capacity is determined as a function of the ultimate dam height, and associated storage volume, both of which were established during the 1975-76 EIS process and subsequently incorporated in the 1977 Master Permit and the 1985 Permit to Mine. While the design and parameters of the basin have not changed over the intervening period, it is now possible to more precisely calculate the remaining and total storage capacity of the basin. Current data demonstrates that the 1975-76 volume estimates were fairly accurate. The only thing that has occurred is the availability of actual data on the volume of tailings deposited into the basin to date, and better estimating tools regarding the volume capacity that remains in the basin designed, evaluated, and permitted between 1975 and 1977. This new information confirms the analysis in the 1975-76 EIS.

Furthermore the size of the basin has not increased. The size of the basin remains the same size of the basin evaluated in the 1975-76 EIS and permitted in the 1977 Master Permit. The fact that the Proposer has not used all the capacity that was permitted in the 1977 Master Permit does not mean that taking actions to do so now

constitutes an expansion within the meaning of Minn. R. 4410.4300, subp. 11B. Therefore, preparation of a mandatory EAW is not required for the Proposed Project.

3.4.4 Minnesota Rules part 4410.3000, subpart 3C – Phased and Connected Actions

No phased or connected actions pursuant to Minn. R. 4410.0200, subps. 60 and 9c, have been identified for the Proposed Project. It is noted that a tailings basin changes over the extended timeframes of actual tailings deposition. It can take decades before the final footprint and depth of tailings is realized. For Mile Post 7, tailings placement has been underway since the late 1970s, with multiple decades of deposition expected to follow, all of which was anticipated and evaluated in the 1975-76 EIS.

4.0 Application of the EIS Supplement Requirements to the Proposed Project

An RGU is required to supplement an EIS when:

1. " substantial changes have been made in the proposed project that affect the potential significant adverse effects of the project";
2. "there is substantial new information or new circumstances that significantly affect the potential environmental effects from the proposed project that have not been considered in the final EIS; or
3. "there is substantial new information or new circumstances . . . that significantly affect the availability of prudent and feasible alternatives with lesser environmental effects."

Minn. R. 4410.3000, subp. 3A.

4.1 Previous Environmental Review

As discussed more fully discussed in Part 4.1.2 below, the Mile Post 7 project was subject to environmental review in the State's "Reserve Mining Company's Proposed On Land Tailings Disposal Plan" EIS conducted over 1975-76. The Draft EIS was released in October, 1975. DNR deemed the EIS complete or final on June 2, 1976. The Final EIS (1975-76 EIS) consists of the 1975 Draft EIS and the transcript and exhibits from the administrative proceeding that occurred in 1976. [See Refs. 8 and 9].

4.1.1 Pre-EIS Litigation History

This EIS was conducted after extensive litigation in both federal and state courts challenging Reserve Mining's ongoing tailings discharge into Lake Superior and emissions of particulate matter from its at Silver Bay facility. Although documenting this litigation history is beyond the scope this ERND, the 1975 Draft EIS includes detailed information in this area, specifically:

- Chronological History;
- Background Relevant to the Preparation of the EIS; and
- References for Part I. [See Ref. 8 at 5-11].

In particular as a function of the litigation, both the water discharge and air emission were found to contain asbestiform fibers that "endangered the health of people exposed to the discharges." This finding was affirmed by the 8th Circuit court of Appeals. *Reserve Mining Co. v. EPA,* 514 F2d 492 (8th Cir. 1975). Prior to this decision, Reserve Mining had identified a potential tailings disposal site near Mile Post 7 of the company's mining railroad. In November 1974, the company submitted applications to the DNR and MPCA to construct an on-land tailings disposal facility at the Mile Post 7 site. Subsequent to these permit applications, the Minnesota Environmental Quality Council (MEQC) determined that an EIS should be prepared for Reserve's Mile Post 7 plan. On May 19, 1975, the MEQC designated the DNR and MPCA as the agencies jointly-responsible for preparation of the EIS. [*Id.* at vii-viii].

4.1.2 EIS Content

The 1975 Draft EIS, which was incorporated into and became the bulk of the final EIS adopted in 1976:

- Evaluated the proposed Mile Post 7 site and the following alternatives: Embarrass Alternative; Colvin Alternative; Snowshoe Alternative; Midway Alternative; and Mine Site Alternative; a "no build" alternative was not evaluated;
- Assessed the following impact areas: mineral potential (i.e., geology); soils; landforms; hydrology; water quality; aquatic habitat and biota; terrestrial habitat and biota; socioeconomics; land use; recreation; transportation; aesthetics; air quality; noise; and energy;
- Identified measures to mitigate adverse environmental impacts;
- Identified irreversible and irretrievable commitments of resources; and
- Disclosed short term uses of the environment versus long term productivity. [*Id.* at xxi-xxiv].

The 1976 Administrative Hearing portion of the 1975-76 EIS included:

- Findings regarding: Present Operations; Mile Post 7 Proposal Changes in Operations; Description of Proposal; Dam Construction; Effects of Dam Failure; Water Resources Effects; Air Quality Effects; Other Natural Resource Effects; Alternatives, including: In Pit Disposal, Changes in Operations for Alternatives, Comparison of Environmental Effects, Economic Feasibility of Alternatives; Effects of Termination; Time Required to Implement; Delta Stabilization; Adequacy of EIS;
- Conclusions; and
- Legal Memorandum. [See Ref. 9 at 4-48].

The EIS for the Mile Post 7 tailings basin was deemed adequate on June 2, 1976. It is relevant for this ERND to note the EIS did not assess any type of clay borrow site for the originally proposed Mile Post 7 project.

4.2 Ongoing Governmental Actions Since 1976

Minnesota Rule 4410.3000, subp. 3B, only applies to "ongoing governmental action" for which an EIS has previously been prepared. The term "ongoing governmental action" is not explicitly defined in Minn. Stat. Ch. 116 D, nor in Minn. R. Ch. 4410. A "governmental action" is defined by Minn. Stat. 116D.04, subd. 1a(d) as "activities including projects wholly or partially conducted, permitted, assisted, financed, regulated, or approved by governmental units, including the federal government." The term ongoing is defined by Merriam-Webster as "continuing or still in process."

As noted in Part 1.2 of this Determination, the Proposer's current activities at Mile Post 7 are subject to both state and federal permits and approvals. And as similarly noted in Part 1.1 of the Determination, the Proposer has continuously used the Mile Post 7 tailings basin for the disposal of tailing waste associated with the processing of ore from the Peter Mitchell Mine since the late 1970s. As discussed in Part 1.2 of this Determination, Mile Post 7 remains subject to a host of federal and state permits, including a Permit to Mine issued in 1985.

The Proposer's current proposed Permit Amendment is for a state permit modification for an ongoing governmental action for which an EIS had previously been prepared. Consequently, the DNR must determine whether a supplement to the 1975-76 EIS is required in accordance with the provisions of Minn. R. 4410.3000, subp. 3B.

4.3 Analysis of Whether Substantial Changes Have Been Made to the Project That Affect the Significant Adverse Environmental Effects of the Project.

4.3.1 Analysis of Whether There are Proposed Substantial Changes In the Project

Under the criteria set forth in Minn. R. 4410.3000, subp. A(1), an RGU is required to supplement an EIS if there has been a substantial change made to a project, and then only if that change affects the significant adverse environmental effects of the project. The term "substantial change" is not defined. The term change is defined in Meriam-Webster as: to make something different, to shift from one to another or, to replace one with another. The term substantial is defined by Meriam-Webster as: significantly great or large in amount. Thus a substantial change means to make something significantly different.

In the case of the Mile Post 7 basin, the initial question posed by Minn. R. 4410.3000, subp. A (1) is whether the Proposer seeks to alter the Mile Post 7 project in a significant way than what was proposed and studied in the 1975-76, EIS and subsequently permitted in the 1977 Master Permit and the 1985 Permit to Mine? The Permit to Mine Amendment includes four proposed actions: 1) extensions of Dams 1 and 2; 2) continued westward progression of tailings deposition; 3) relocation of West Ridge Railroad; and 4) development of a new clay borrow site.

4.3.1.1 Proposed Extensions of Dams 1 and 2

4.3.1.1.1 Dams as Analyzed in the 1975-76 EIS

Overall, tailings entrainment was to be accomplished with a mix of physical structures (i.e., dams) placed in ways to take advantage of the site's "valley" topography. Four dams were proposed, three of which were to be built during the first 10 years of operations. The dams were to primarily consist of "coarse," or cobbed, filtered tailings. Dikes were also to be constructed of coarse tailings. The 1975-76 EIS also specified the ultimate dam heights for all four main dams at 1,280 ft amsl. Dams 1 and 2 were to be the main structures to "close" the open ends of the valley and allow tailings to be entrained and build up over time. While dams would be the main means of "closing the valley" to the southwest (Dam 1) and northeast (Dam2), the general rise in elevation to the west would set the limit of tailings build-up for that part of the tailings basin. [See Ref. 8 at 35].

The main dams would be constructed using the downstream method of construction. [See Ref. 9; Admin. FOF at ¶ 16]. This meant that "[a]s the height of the dam increases, the dam is constructed in the direction away (or

downstream from) the basin. *Id.* The downstream method was thought to be safer because it "avoids placement of the dam construction materials on previously deposited fine materials, which would be unsuitable as a base for the dam." *Id*. Finally, it was noted clays were present in the substrate at Dam 1 with the need for them to consolidate over the course of dam construction; the necessary degree of clay consolidation would have to be confirmed by monitoring. [*Id*.; Admin. FOF at ¶¶ 20 through 25].

The EIS indicated a "board of independent consultants" was to be formed that, together with the DNR, would review and approve the design, and construction plans and specifications, and make periodic inspections during construction and operation. [*Id.* at 285].

4.3.1.1.2 Dam Changes in the Request for Permit Amendment

The requested Permit Amendment proposes extensions of Dams 1 and 2, by 8,100 ft and 4,100 ft respectively, to enable continued placement of tailings at Mile Post 7. As such these extensions would be a continuation of historic dam-building activities at the tailings basin. These extensions would have the same final dam elevation as the existing dams at 1,315 ft amsl. A more detailed description of these extensions follows:

- Dam 1 Extension. This modification and extension is necessitated because of the placement of an ash landfill in the south west corner of the Mile Post 7 site. The extension will protect the ash landfill from inundation by tailings to the permitted maximum elevation. The ash landfill was not a project feature at the time of the 1975-76 EIS; see Part 4.2.3.7 of this Determination for information regarding the ash landfill. To avoid the ash landfill and to progress tailings deposition to the basin's planned capacity at the ultimate dam height of 1,315 ft amsl requires extending the western end of Dam 1 around the landfill through a series of turns. Due to a drop in elevation at the jog back to the northeast, the proposed extension also limits tails from being deposited in an area that leads from the main pool up to the vicinity of Diversion Dike 2. All of this activity is within the current Permit to Mine area of disturbance boundary.

- Dam 2 Extension. This extension is the same as envisioned in the EIS and subsequent permitting. Dam 2 is already oriented northwest to southeast. The proposed Dam 2 extension would continue dam construction upslope to the ultimate dam height of 1,315 ft amsl. Now that the required engineering specifications are available for both the dam extension and rail line relocation, the Proposer has determined that an estimated 30.08 acres falls outside the current Permit to Mine area of disturbance boundary and will need to be impacted to meet Mile Post 7 Project objectives set out in the 1975-76 EIS, the 1977 Master Permit, and the 1985 Permit to Mine. This area of additional impact will be refined during the Permit Amendment process.

To accomplish these extensions the Proposer would continue to use the modified centerline construction method, which was changed from the downstream method subsequent to the EIS. This construction method is also referred to the offset-upstream method and has been in use for both dams since 2003. [See Ref. 24 at 4, 8]. The method of new dam construction is similar to the original concept, including site clearing, constructing a starter dam, and subsequent coarse tailings placement and compaction. Construction of the expanded dam segments would occur in conjunction with raises of the existing dam segments. The final engineering details for the extensions to both Dams 1 and 2, along with all subsequent raises, would be provided to DNR as part of ongoing permitting.

Finally, although there is no Dam Safety permit itself, dam safety at Mile Post 7 is regulated through DNR's review and approval of the series of facility Five Year Operation Plans. The proposed enlargement (i.e., extension) of the existing dams is considered under the relevant provisions of the dam safety requirements under Minnesota Rules parts 6115.0300 to 6115.0520. The 2019-2023 Five Year Operation Plan does not address the Proposed Project, including the extensions of Dams 1 and 2. Additional DNR review and approval would be required before the Proposed Project could proceed.

4.3.1.1.3 Do the Proposed Dam Extensions Constitute a Substantial Change in the Project?

Dam construction has been feature of Mile Post 7 operations from the start. Both the length and height of the dams has increased as amount of tailings filled the basin, and the dams are expected to get higher until they reach the final permitted dam height of 1,315 ft amsl. The proposed dam extensions would continue to rely on the modified centerline or offset upstream construction method that has been in place since 2003. While the proposed Dam 1 extension almost doubles the length of the dam, much of this length is due to the need to avoid tailings covering the ash landfill. The proposed Dam 2 extension is necessary to reach the final dam height and accommodate the relocated West Ridge Railroad. Construction proper for both dam extensions is similar to that evaluated in the 1975-76 EIS, which still involves site clearing, constructing a starter dam, and subsequent coarse tailings placement and compaction.

The proposed extensions of Dams 1 and 2 are a continuation of the historic dam building activities at Mile Post 7. The proposed extensions are necessary to facilitate ongoing tailings storage to the final basin elevation of 1,305 ft amsl. They do not require a change in dam construction methods and practices from those occurring under current operations. No increase in final dam height is proposed. Although the Proposer estimates approximately 30 acres of construction activity for Dam 2 would fall outside the EIS study area and current Permit to Mine area of disturbance, this acreage is negligible relative to the Project as a whole. Given these circumstances, the proposed extensions of Dams 1 and 2 are not significantly different from the Project and thus do not constitute a substantial change in the potential significant adverse environmental effects of the Project.

4.3.1.2 Continued Westward Progression of Tailings Deposition

4.3.1.2.1 Tailings Deposition as Analyzed in the 1975-76 EIS

The 1975-76 EIS identified an area covering 4.6 square miles, or approximately 2,950 acres, as the proposed site for fine tailings to be deposited, with an additional 3.0 square miles available as a coarse tailings storage area. The principal activity prior to tailings deposition was vegetation clearing. Tailings would be delivered via pipeline from the Silver Bay facility as a slurry consisting of 60% solids by weight. There was storage capacity available to accommodate 40 years of tailings production. [See Ref. 8 at 17, 18, 35, 45].

4.3.1.2.2 Tailings Deposition Changes in the Request for Permit Amendment

The Permit Amendment does not propose any change in the rates or volumes of tailings deposition into the Mile Post 7 tailings basin, nor does it request any change in the total permitted tailings deposition area of approximately 2,950 acres. The Proposer updated the remaining available area for tailings storage, assuming a maximum dam height of 1,315 ft amsl, down to approximately 2,800 acres. If implemented, the proposed Project

Amendment would involve the placement of tailings in the final 650 acres of the basin, which means the tailings footprint would continue to increase from its present footprint of 2,150 acres until the maximum basin elevation of 1,305 ft amsl is reached. There is however a 550-acre area in the northwest part of the basin, inside the proposed relocated West Ridge Railroad, which would not have tailings build-up because the natural topography of the area is above 1,315 ft amsl. See ERND Figure 3: Proposed Tailings Progression.

4.3.1.2.3 Does the Proposed Tailings Deposition Constitute a Substantial Change in the Project?

Tailings deposition has been a feature of Mile Post 7 operations from the start, with no change in the rate or volume of tailings deposition proposed. The actual area covered by tailings has increased over time, generally progressing westward over time. The Project Amendment facilitates tailings deposition to the final permitted dam height of 1,315 ft amsl by protecting the ash landfill from being covered by tailings. The activities around tailings management and deposition is similar to that evaluated in the 1975-76 EIS.

Tailings deposition as proposed constitutes a continuation of historic tailings placement activities at Mile Post 7. Tailings would cover approximately 650 acres that are available at a maximum dam height of 1,315 ft amsl. Given these circumstances, the proposed westward progression of tailings coverage over the remaining operation life of Mile Post 7 is not significantly different from the Project evaluated in the EIS and subsequently permitted, and thus does not constitute a substantial change in the potential significant adverse environmental effects of the Project.

4.3.1.3 Relocation of the West Ridge Railroad

4.3.1.3.1 West Ridge Railroad as Analyzed in the 1975-76 EIS

The 1975-76 EIS generally noted that the coarse tails required for dam construction would be delivered to the Mile Post 7 basin by means of Reserve Mining's existing mining railroad; see ERND Attachment 5: Possible Railroad Spur. The railroad spur would be used to transport cobbed and filtered tailings to the tailings basin to be used in dam construction over the life of the project. Although no location was specified in the EIS, an estimated 5.5 miles of new railroad construction would be necessary to connect the existing Reserve Railroad line at Mile Post 6.5 to the future operations at Mile Post 7. The railroad spurs would impact an estimated 0.08 square miles, or some 51 acres. No further details were provided. [*Id.* at 25, 31, 35].

4.3.1.3.2 West Ridge Railroad Changes in the Request for Permit Amendment

In order to use the remaining portion of the basin for tailings deposition, the West Ridge Railroad line and corridor will need to be relocated. The relocated corridor would be placed approximately 4000 ft to the northwest of the existing rail line at an elevation above 1,315 ft amsl. The majority of new railway embankment construction would occur separate and outside the extended dam footprints, although the new railway embankment would be constructed on a small section of the Dam 1 extension, while abutting the entire length of the Dam 2 extension. There will be culvert(s) placed under/through the railroad grade to allow water from western pond to flow toward the basin pond. The relocated railway would be inside the existing diversion ditches that were designed and constructed at the western limit of the tailings basin permit boundary. The new railway, as does the existing

railway, would be used to supply plant aggregate and filter sands as construction materials for ongoing development of the dams. Similar to the proposed Dam 1 extension, the proposed railroad grade corridor would be configured to avoid impacts to the existing ash landfill. Although the Proposer has not identified need for any change in the permit boundary with the new railroad alignment, this would be determined during the Permit to Mine Amendment process. See ERND Figure 4: Proposed Railroad Relocation.

A similar materials supply railroad relocation occurred in 2005. Just like then, the Proposer reports the existing rail, ties, and hardware would be removed prior to being covered with tailings. No other preparation would be required because the railroad grade itself is made of coarse tailings, which is material that is authorized to be placed within the tailings basin. Because this railroad grade is not foundation for any future dams, it can remain in place as it currently is. As tailings continue to be delivered into the basin, the railroad grade would be overtopped and covered with tailings. Because there are no plans to progress tailings deposition beyond the current permitted final dam height of 1,315 ft amsl, post-operational reclamation and closure of the relocated West Ridge Railroad must comply with provisions of Minn. R. Ch. 6300.

4.3.1.3.3 Does the Proposed Railroad Relocation Constitute a Substantial Change in the Project?

Operation of a material supply railway, located along a spur connecting the greater Reserve Mining Railroad to the tailings site, has been feature of Mile Post 7 operations from the start. The current action would represent the third railroad grade corridor to be used to supply materials for use in dam construction. Construction of the grade itself, with subsequent placement of the rails, does not require any new materials or methods beyond those associated with development and operation of the previous spur(s). Unlike the previous spurs, the relocated Western Ridge Railroad would not be overtopped by tailings but would be subject to mineland reclamation and closure procedures.

The proposed relocation of the Western Ridge Railroad is a continuation of the historic dam building activities at Mile Post 7. The proposed relocation is necessary to provide construction materials to facilitate ongoing dam construction to a final dam height of 1,315 ft amsl. Although not evaluated specifically in the 1975-76 EIS, the activity is well within the range of actions anticipated over the operational life of the Mile Post 7 tailings basin. Given these circumstances, the proposed relocation of the West Ridge Railroad is not significantly different from the Project and thus does not constitute a substantial change in the potential significant adverse environmental effects of the Project.

4.3.1.4 Development of a New Clay Borrow Site

4.3.1.4.1 A Clay Borrow Site as Analyzed in the 1975-76 EIS

The 1975-76 EIS did not assess any borrow material requirements, including clay suitable for dam core construction at Mile Post 7.

4.3.1.4.2 New Clay Borrow Site Changes in the Request for Permit Amendment

Formal development of a clay borrow site at Mile Post 7 would be a new project feature. It would supply the clay necessary for the continued construction of Dam 5, which originally included a sloping clay core. The Proposer

intends to extract clay material from a clay borrow pit developed on approximately 100 acres of company-owned property located south of the basin. Construction for Dam 5 includes a clay core that requires a steady source of compatible clay materials for continued construction. The Proposer reports some clay removal activity has already occurred at the site, but the need for a continuous source of suitable clay as a construction material would be addressed with this part of the proposal. Once clay removal ceases, the area would be reclaimed depending on depth of the resource and whether bedrock was exposed. The Permit to Mine amendment process will determine whether any adjustments to the permitted area of disturbance would be needed for approval. See ERND Figure 5: Borrow Area.

4.3.1.4.3 Does Development of a New Clay Borrow Site Constitute a Substantial Change in the Project?

Construction of Dam 5 has required suitable clay material for development of a sloping clay core from the start. The proposed clay borrow site is designed to provide a steady source of construction clay material from property controlled by the Proposer. Although not evaluated in the 1975-76 EIS, development of borrow sites are routine with all types of development, and development of this site falls within the realm of greater construction and operational activities, and related impacts, known at the time of the EIS. Given these circumstances, the proposed development of a new clay borrow site is not significantly different than the Project and thus does not constitute a substantial change in the potential significant adverse environmental effects of the Project.

4.3.2 Analysis of the Availability of New Information or Circumstances that Significantly Affect the Potential Environmental Effects from the Proposed Project that Were Not Considered in the 1975-76 EIS

Minnesota Rule 4410.3000, subp. 3A(2), requires an RGU to supplement an EIS when there is new information or new circumstances that "significantly affect the potential environmental effects from the proposed project that have not been considered in the final EIS." This standard requires the agency to determine whether there is new information or circumstances since the 1975-76 EIS, 1977 Master Permit, and 1985 Permit to Mine, or other sources and to assess whether that new information or circumstances significantly affect the potential environmental effects from the Proposed Project that were not considered in the 1975-76 EIS. The DNR has identified the following categories of new information and circumstances not considered in the 1975-76 EIS that must be analyzed in the present to assess whether they significantly affect the potential environmental effects from the EIS.

4.3.2.1 Wetlands

4.3.2.1.1 Wetland Impacts Analyzed in the 1975-76 EIS

The 1975-76 EIS was scoped to consider how construction of a tailings basin would change the surface character of the Mile Post 7 site, including "marshes." Tailings deposition was projected to cover or fill 800 acres of existing wetlands. New wet areas were expected to be created from ponds forming over certain areas that were previously wet and subsequently filled with tailings. The 1975-76 EIS concluded that filling these wetland or marshes would result in a permanent impact affecting the underlying hydrology of the basin and the watershed, especially in the ability of the hydrologic system to convey or store runoff. Although the state had yet to adopt

the Wetland Conservation Act, and wetland mitigation was not required in 1975, the 1975-76 EIS indicated that at the close of the Mile Post 7 tailings basin, there would be some degree of mitigation for these lost wetlands if a permanent settling pond was left onsite. Of all of the alternatives analyzed in the 1975-76 EIS, the alternative that was ultimately adopted and permitted in the 1977 Master Permit (i.e., Mile Post 7) had the least impact on "marshes" or wetland. [See Ref. 8 at 222, 224-225].

The Finding of Fact from the Administrative Hearing did not address wetland impacts for any project-related activities. Although there were some modifications to the Project highlighted in the Final EIS, these do not appear to substantially alter the estimated 800 acres of wetland losses at the Mile Post 7 site from the 1975-76 EIS.

Wetland impacts associated with onsite borrow site that would be "mined" to provide construction materials were not studied in the 1975-76 EIS.

4.3.2.1.2 New Information or Circumstances Regarding Wetlands Available Since the 1975-76 EIS

The ability to identify, specify the type, and delineate wetlands has improved substantially since the EIS, however the original estimate of approximately 800 acres of total direct wetland impacts associated with developing Mile Post 7 remains valid. The Proposer anticipates impacting another 264 acres of wetlands within the basin originally evaluated in the 1975-76 EIS and permitted in 1977; these impacts have been reviewed for Wetland Conservation Act compliance and permitted in May, 2019, including mitigation. These impacts result mainly from the proposed continuation of the westward tailings progression, but also from the dam extensions and relocation of the material supply railroad. Assuming the EIS's estimated 800 acres is valid, up to this time the Proposer has impacted up to 536 acres of the original 800 acres of marsh or "wetland" identified as potentially impacted wetlands by the Project.

In addition since the EIS and original permitting, it is possible to specify potential indirect wetland impacts, the sources of which can for example include changes in surface water or sediment loading, wetland fragmentation, loss of recharge area, or changes in local drainage patterns. Beyond the capability of the EIS analysis, an estimated 35 acres of indirect wetland impacts (of the total 264 acres) have been identified due to the proposed tailings impoundment. Both the estimated direct and indirect wetland impacts have been evaluated for demonstration of impact avoidance and minimization, which is a consideration in wetland permitting (described below).

At DNR's request the Proposer has identified approximately 18 acres of direct and indirect wetland impacts outside the EIS study boundary due to the proposed extensions of Dams 1 and 2. These impacts should be similar to the wetland impacts within the EIS study boundary. The Permit to Mine Amendment process will evaluate these impacts for appropriate demonstration of impact avoidance and minimization, and identify any need for mitigation if not already required.

As noted far greater specificity around wetland impacts is available today than was available at the time when the 1975-76 EIS was prepared. As discussed in Part 4.3.2.1.1 of this Determination, at the time of the EIS the state had yet to adopt the Wetland Conservation Act and wetland mitigation was not required. The yet unused portion of the tailings basin contains the approximately 264 acre balance of the 800 acres of wetland that were anticipated to be impacted in total by the 1975-76 EIS. Because none of these wetlands are public water wetlands within the meaning of Minn. Stat. § 103G.105, subd. 15a, a work in public waters permit is not required to fill these remaining

264 acres of wetlands. *See generally,* Minn. Stat. § 103G.245, subd. 245 (requiring a work in public waters permit to drain a public waters wetland).

Pursuant to the Wetlands Conservation Act, which was adopted in 1991, all other wetlands that are not designated as public water wetlands may be drained by the party owning the property on which the wetland is situated provided the owner has developed an a wetland replacement plan, and all wetlands that have been drained and/or filled have been replaced by wetlands that provide at least equal public value pursuant to a plan approved the appropriate local unit of government. Minn. Stat. §§ 103G.221 and 103G.222. In the case of mining operations, the DNR operates as the local government authority for purposes of wetland regulation. Minn. R. 8420.0930.

Thus while the Wetland Conservation Act was not adopted until after the 1977 General Permit and the 1985 Permit to Mine, after 1991 the Proposer has been required to classify wetlands, develop a wetland replacement plan, and provide wetland replacement to replace wetlands that were filled in the course of the ongoing deposition of the tailings in the Mile Post 7 tailings basin. For example, the Proposer was required to comply with the requirements of the Wetland Conservation Act in 2005 when it relocated the West Ridge Railroad and a diversion ditch. A total of 22.21 acres of wetlands were impacted with that activity, which included impacts to the following wetland types: shrub swamps (Type 6); forested swamps (Type 7); tamarack and cedar bogs (Type 8); shallow marshes (type 3); and wet meadows (Type 2). Mitigation was accomplished through purchase of wetland banking credits from the Embarrass River Wetland Mitigation Bank. DNR approved the Wetland Replacement Plan in August, 2005. [See Ref. 1].

As part of its plan to extend Dams 1 and 2 in order to use the remaining capacity of the Mile Post 7 tailings basin, the Proposer has characterized the 264 acres of wetland located in the unfilled portion of the basin that will be filled over the next several years. Table 4a of the 2019 Joint Wetland Replacement Plan is provided below, which characterizes the plant community types of the approximately 264 acres of wetland that will be filled under the Proposed Project to the final previously permitted capacity of the basin. [See Ref. 4 at 32].

Table 4a: Wetland Plant Community Impact Summary

Plant Community Type	**Direct Wetland Impacts (ac)**				**Potential Indirect Wetland Impacts[1] (ac)**
	Railroad and Dams	Tailings Basin Progression	Fragmentation	Total Project Wetland Impacts	
Hardwood Swamp	23.78	71.88	0.00	95.66	35.00
Shallow Marsh	0.60	43.10	0.10	43.80	0.00
Alder Thicket	9.05	31.57	3.90	44.52	0.00
Coniferous Swamp	8.72	29.30	0.56	38.58	0.00

Sedge Meadow	0.0	1.48	0.02	1.50	0.00
Fresh (Wet) Meadow	0.0	2.66	0.00	2.66	0.00
Riverine	0.58	0.99	0.00	1.56	0.97
Total	**42.73**	**180.98**	**4.58**	**228.30**	**35.97**

As a condition of using this unused capacity of the tailings basin and filling the wetlands that are not yet filled within the tailings basin, the DNR through ongoing regulatory activity, reviewed and approved a wetland replacement plan in accordance with Minn. R. 8420.0930[1]; this is discussed in detail below. The Permit to Mine Amendment process will confirm any new, unaccounted impacts being subject to wetland avoidance/minimization sequencing and mitigation requirements from the Proposed Project. The fact that the sum total of these wetlands will need to be filled is not new information nor do they represent new circumstances. Both the regulated party and the DNR have known since completion of the 1975-76 EIS that these wetlands will need to be filled, and both parties have known of and complied with the wetland replacement requirements as the basin is filled since the passage of the Wetland Conservation Act in 1991. The DNR has, therefore, concluded that wetland impacts and associated replacement requirements associated with filling the basin do not constitute significant new information or circumstances.

The extension of Dam 2 will, however, impact an estimated 30 new acres of land outside of the EIS analysis footprint, but immediately adjacent to the Mile Post 7 Project area studied in the 1975-76 EIS and subsequently permitted. Any wetlands proposed to be impacted will be reviewed in the Permit to Mine Amendment process subject to the impact sequencing and mitigation requirements of the Wetlands Conservation Act. Similarly, although the Proposer indicates wetlands can be avoided at the clay borrow site, project activity will be monitored for potential wetland impacts and applicable regulatory requirements. Although these impacts were not identified in the EIS, they are not expected to reach any environmental review threshold, and are considered

[1] The wetland impacts associated with both the new elements of the Mile Post Tailings Project and the use of the remaining capacity of the tailings basin are subject to DNR and USACE permitting requirements. In support of USACE permitting, the MPCA noticed its draft Section 401 Water Quality Certification on December 31, 2020. This was issued under authority of Section 401 of the Clean Water Act (CWA), Minnesota Statutes Chapters 115 and 116, and Minnesota Rules parts 7001.1400 to 7001.1470, Chapters 7050, 7052, and 7053. The purpose of the certification is to document whether the discharge will comply with state water quality standards. The draft decision determines the activities subject to review would be conducted in a manner that will not violate applicable water standards, subject to a list of conditions. [See Ref. 21 at 7].

minor, thus not rising to the level of new information or new circumstances that would yield significant environmental effects.

The known wetland impacts associated with the extensions of Dams 1 and 2, relocation of the railway, and continued progression of the tailings area, were evaluated in a Joint Wetland Replacement Plan (WRP) submitted on June 18, 2018. The application set out a wetland mitigation proposal for the 264.27 WCA jurisdictional wetland impacts associated with using the remaining capacity in the tailings basin. After review of the application and a site visit, a final application including a wetland replacement plan was submitted to the DNR on April 29, 2019. The proposed wetland replacement plan includes the purchase of wetland credits at a 1:1 ratio from the Lake Superior Wetland Bank Account #1609, which is located in the same BSA (#1) as the wetland impacts. The Wetland Replacement Plan was approved on May 9, 2019. [See Ref. 4 at Sections 7.3 and 7.4]. For the plan to be approved, the Proposer was required to demonstrate impact avoidance and minimization as required and as addressed through conditions of the 2019 WCA decision.

The Wetland Replacement Plan was approved with the following two conditions:

1. Prior to wetland impacts, a monitoring plan for potential indirect wetland impacts must be submitted for review and be approved by DNR.
2. Prior to wetland impacts, a plan for engineering controls to avoid and minimize the potential for indirect wetland impacts must be submitted for review and be approved by DNR.

DNR understands actions on these two conditions are underway, as the associated impacts have not yet occurred (i.e., new basin infrastructure construction has not started). A monitoring plan as required by condition 1 (above) has been received and review is underway.

Conclusion. The 1975-76 EIS identified that if implemented, the Mile Post 7 Project would result in approximately 800 acres of marshland loss as a function of basin construction and operation, principally due to being covered by fine tails discharged over the life of the Project to an elevation of 1,305 ft amsl. The current Proposed Project involves installation of infrastructure so that the unused capacity of the tailings basin studied in 1975-76, and subsequently permitted in 1977, can be used for the deposition of tails resulting from ore mined from the Peter Mitchell Pit and processed in Silver Bay. The wetland impacts and associated wetland regulations adopted after Mile Post 7 was evaluated and permitted do not constitute new information or changed circumstances. It was always understood that 800 acres of wetland would be filled by the Mile Post 7 Project. Likewise, the regulatory requirements of the 1991 Wetland Conservation Act have been applied to the Mile Post 7 Project since as early as 1991. Consequently, it cannot reasonably be said that the wetland requirements constitute new information or circumstances that affect the significant environmental effects of the Mile Post 7 Project. If anything, the actions taken after 1991 to apply the requirements of the Wetland Conservation Act to the Mile Post 7 Project have served to mitigate the potential adverse impacts to wetlands articulated in the 1975-76 EIS. Thus the DNR concluded that the wetland developments that have occurred after the publication of the 1975-76 EIS do not give rise to the need to supplement the 1975-76 EIS.

4.3.2.2 Dam Safety

Overall, tailings entrainment was to be accomplished with a mix of physical structures placed in ways to take advantage of the site's "valley" topography, with Dams 1 and 2 as the main structures to "close" the open ends of

the valley and allow tailings to be entrained and build up over time. While dams would be the main means of "closing the valley" to the southwest (Dam 1) and northeast (Dam2), the general rise in elevation to the west would set the limit of tailings build-up for that part of the tailings basin. The construction materials railroad provides no tailings entrainment function; this is reserved for the dams.

4.3.2.2.1 Dam Safety Impacts Analyzed in the 1975-76 EIS

As reflected in the Finding of Fact from the Administrative Hearing, there was substantial testimony taken regarding the construction, operation, and safety of the three main project dams (Dam 1, Dam 2, and Dam 5). This included testimony and exhibits addressing potential catastrophic dam failure. [See Ref. 9; Admin. FOF at ¶¶ 15 through 25 at 9-12]. Of significant concern was the fact that the Mile Post 7 dam site was 600 feet vertically above and 3 miles away from Lake Superior. [*Id.* at 12]. Accordingly dam safety was a significant focus of the EIS Administrative Hearing. Consequently the main dams would be constructed using the downstream method of construction. This meant that "[a]s the height of the dam increases, the dam is constructed in the direction away (or downstream from) the basin. [*Id.*; Admin. FOF at ¶ 16]. The downstream method was thought to be safer because it "avoids placement of the dam construction materials on previously deposited fine materials, which would be unsuitable as a base for the dam." *Id*. Finally, it was noted that clays were present in the substrate at Dam 1 that would need to consolidate over the course of dam construction; this would have to be confirmed by testing and monitoring. [*Id*.; Admin. FOF at ¶¶ 20 through 25].

The dams at Mile Post 7 are classified as High Hazard or Class 1 dams. As is true for any EIS analyzing a Class 1 dam, the potential consequences of a dam breach was considered for Dams 1, 2, and 5. A Class 1 dam is a dam in which "failure, mis-operation, or other occurrences or conditions would probably result in…any loss of life or serious hazard, or damage to health, main highways, high-value industrial or commercial properties, major public utilities, or serious direct or indirect, economic loss to the public." Minn. R. 6115.0340, subp. A. The FOF found that a breach of a 1000 ft section of Dam 1:

- Would produce a 28-foot wall of water traveling 20 miles per hour down the Beaver River Valley to Lake Superior.
- The breach discharge would impact eight residences.
- Tailings would be deposited into Lake Superior with no opportunity for recapture.
- Risk of failure would be perpetual.

[*Id.*; Admin. FOF at ¶¶ 26-31].

A number of project alternative sites were evaluated but it was determined that "[d]ams of the same design and construction would have higher safety factors at each alternative site than at Mile Post 7. The consequences of dam failure would be significantly lower at each alternative than at Mile Post 7." [*Id*.; Admin. FOF at ¶ 86].

4.3.2.2.2 New Information or Circumstances Regarding Dam Safety Impacts Available Since the 1975-76 EIS

Dam construction at Mile Post 7 commenced in 1977-78 under the DNR 1977 Master Permit. The tailings dams are composed of coarse and cobbed tails. Development involves construction of starter dams followed by construction of multiple raises to increase the dam height over time. Because of an economic downturn in the

late 1970s and early 1980s, Reserve Mining had insufficient construction materials to build the dams as originally proposed, which called for use of the "downstream construction method" for Dam 1 and a "centerline construction method" for Dam 2. [See Ref. 22 at 19]. Consequently, the dam construction method was modified to allow fine tailings to be spigotted behind the two starter dams, and after about 60 feet of elevation gain, the process switched to the modified centerline or offset upstream construction method in 2003. Modified centerline is a combination of upstream and centerline methods, which is often done to reduce the volume of construction material required to be placed within the embankment. [See Ref. 26 at 4, 8].

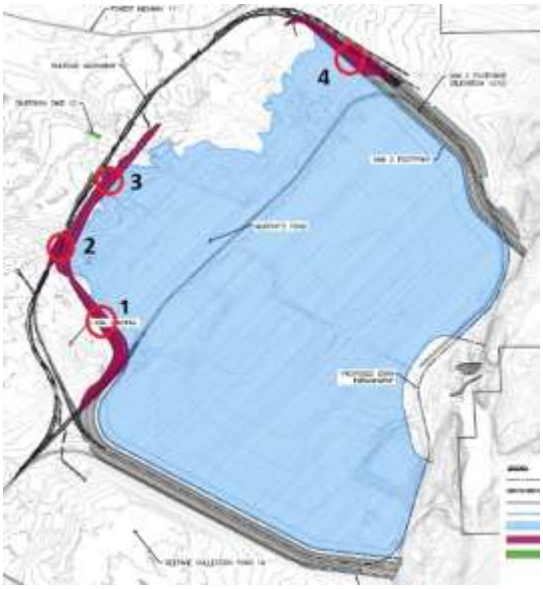
As Class 1 dams, the Mile Post 7 dams are monitored daily by the basin engineer and other employees working on the dam. A qualified engineering firm is required to perform a dam safety inspection in the spring of each year, with a thorough detailed inspection conducted over several days in October. The purpose of the annual inspection is to review the performance and condition of the dams. The information is compiled in an Annual Report. This inspection includes a thorough analysis of the monitoring data system. [See Ref. 26 at Appendix B]. In addition, the Proposer must prepare an Emergency Action Plan (EAP) to define responsibilities and provide procedures to be followed in the event of a flood, potential failure, or actual failure of the Dams 1, 2, or 5; the EAP is currently being updated for DNR review and approval later in 2021 according to schedule.

A Five Year Operation Plan is required for the Mile Post 7 dams every five years. Professional engineers review the Five Year Operation Plan for compliance with current dam safety standards, including the inspection for field verification of the design. The current Five Year Operation Plan for the dams covers 2019-2023, where Part 4.7.2 reports the results of updated analyses since 2013. The Factors of Safety consistently assessed at the Mile Post 7 dams include various scenarios for Effective Stress Stability Analysis (ESSA) and Undrained Strength Stability Analysis (USSA); these scenarios include various iterations around block failure, fine tailings yield strength, and liquefied strength. DNR accepts the following values for minimum Factors of Safety: ESSA = 1.50; USSA = 1.30; and liquefied = 1.10. Tables 3, 4, and 5 of the 2019-2023 Five Year Operation Plan provide the Computed Factors of Safety for Various Scenarios for Dams 1, 2, and 5 respectively. [See Ref. 26 at 19-26]. The current Factors of Safety for the Mile Post 7 dams exceed the DNR minimum values. For the most recent computed Factors of Safety for Dams 1, 2, and 5 under a variety of pond stability scenarios, see ERND Attachment 8: Computed Factors of Safety. DNR's review of the most recent round of geotechnical evaluation of Dams 1 and 2 indicate that both dams are robust with Factors of Safety well above recommended levels.

DNR currently conducts annual site visits and reviews the Annual Report provided in the Five Year Operation Plan; this would continue over the operational life of the facility. The most recent DNR dam safety inspection results indicate the dams are well maintained and in good condition, with no major dam safety issues being noted. [See Ref. 14].

To better understand the proposed dam extensions, DNR sought additional project details from the Proposer, including preliminary cross-sections and dam heights at four (4) select locations depicted below. See ERND Attachment 6: Select Locations X-Sections, and ERND Attachment 7: Simplified X-Sections, for the preliminary cross sections corresponding to these locations. The approximate dam heights at these locations would be as follows:

X-Section 1 Height = **30 ft** **X-Section 2 Height** = **60 ft** **X-Section 3 Height** = **30 ft** **X-Section 4 Height** = **20 ft**



DNR's preliminary review of the cross-sections indicates geotechnical performance would likely be within industry standards. Because both of these dams are Class 1 dams, the DNR would continue to conduct ongoing inspection of the dams and their extensions.

Regarding the 1975-76 EIS's attention to the lacustrine clays beneath the proposed Dam 1 site, the evaluations reviewed by DNR appear in line with the assessment of the clay foundation detailed in the EIS. If the clay met the appropriate design specifications, then there is no need for further testing. The clay was monitored with settlement plates early on and is retested regularly. Review of the supporting documents does not suggest a problem with dam stability due to the presence of lacustrine clays at Dam 1.

Conclusion. The calculated stability of the Mile Post 7 dams are reviewed every five years as part of the DNR's Five Year Operation Plan approval process. As part of this Permit to Mine Amendment, the Proposer would be required to demonstrate in the facility design report that Dams 1 and 2 as modified will continue to meet stability requirements. In light of tailings dam failures in other countries such as Canada and Brazil, the DNR has evaluated new information available about the dams at Mile Post 7 since the 1975-76 EIS, including the methods of construction, calculated Factors of Safety for the existing dams, and the likely geotechnical stability of the proposed extensions, based on the latest science. There is no substantial change in construction techniques proposed with the extensions of Dams 1 and 2. The Proposer will continue to use the modified centerline method to build all of the dams, including the extensions. Available evidence indicates the existing dams at Mile Post 7 are exceeding minimum Factors of Safety, and there is no reason to expect the proposed extensions of Dams 1 and 2, nor the continued deposition of tailings within the basin, would compromise that situation. Considering the Proposed Project in terms of dam safety, there is no substantial new information or new circumstances that significantly affect the potential environmental effects of the Project that have not been considered in the 1975-76 EIS.

4.3.2.3 Water Quality

4.3.2.3.1 Water Quality Impacts Analyzed in the 1975-76 EIS

The 1975-76 Draft EIS analyzed water quality impacts associated with the various tailings basin alternatives as well as those specific to the Mile Post 7 Project.

Tailings Basin Alternatives Water Quality Analysis. The 1975-76 EIS indicated that any of the tailings basin alternatives could have impacts on the water quality of surrounding waters during construction, operations, reclamation, and closure.

Construction impacts included:

- Increased turbidity from site preparation activities, where vegetation removal would expose the soil thus increasing potential erosion into natural waters.
- Offsite transport of dissolved substances from exposed mineral soils.
- A potential change in pH of downstream river water, which would depend on the characteristics of the pre-project, undisturbed condition of the subwatersheds at the site (i.e., bog versus upland). This impact was not anticipated to be significant.

Operations impacts included:

- Effects on groundwater and surface water caused by seepage of impounded waters, where the proposed capture and recycling of seepage was expected to result in dissolution of many ore-bound substances, including calcium, magnesium, sodium, manganese, and silica that would eventually reach an equilibrium state for concentrations.
- Effects to adjacent watercourses caused by the accidental release of impounded waters.
- Effects on receiving surface waters in the event that tailings were released as a result of minor pipeline ruptures.
- Effects on receiving surface waters caused by the deposition of asbestiform fibers from either fugitive dust or uncollected seepage.

Reclamation and Closure impacts included:

- Effects from overflow, runoff, and seepage, which could reflect the equilibrium concentrations of dissolved constituents as well as be a source of asbestiform fibers (in overflow). [See Ref. 8 at 227].

Mile Post 7 Water Quality Analysis Impacts. The potential water quality impacts associated specifically with the Mile Post 7 alternative analyzed in the 1975-76 EIS included:

- Turbidity Impacts from Stream Diversion. Big Thirtynine Creek, Little Thirtynine Creek, and an unnamed creek would have to be diverted if the Mile Post 7 site were selected. This diversion was projected to cause turbidity impacts to downstream water resources, principally during construction. [*Id*., Table 88 at 228].

- Introduction of Chlorides. It was anticipated that chloride would be used on the site for winter road maintenance activities, and that the use of this chemical could result in degraded water quality. [*Id.*].

- Pipeline Breakage Impacts. Across the respective alternatives considered in the EIS, the pipeline length, gradient, and number of crossings was greatest for the Mile Post 7 alternative. This pipeline configuration would result in adverse water quality impacts should a pipeline break. [*Id.*] To address the potential for spillage from pipelines, a series of collection facilities were incorporated into the design, automatic flow monitoring and pipeline inspections were recommended, and a dual-pipeline design employed. [See Ref. 9; Admin. FOF ¶¶ 41 and 42]. This system would also mitigate fishery impacts associated with any spillage. [*Id.*; FOF ¶78].

- Coarse Tailings Storage Area Impacts. It was determined that the storage of coarse tailings outside of the tailings basin itself could lead to adverse water quality impacts as leached constituents reached surface water and groundwater resources. [See Ref. 8, Table 88 at 228].

- Seepage. A fundamental water quality concern was seepage and the associated damage to water quality and downstream fisheries. Preliminary analysis estimated seepage rate losses from both construction and operation at Mile Post 7 at 180 gal/minute. [*Id*., Table 87 at 227-228]. Reserve Mining proposed to address this seepage by incorporating a seepage collection system (i.e., catchment areas) at the toe of the dams. [*Id.* at 45]. Despite proposed efforts to collect seepage from the tailings basin, it was determined during the EIS Administrative Hearing that some amount of uncollected seepage would continue to occur. Consequently, the construction of seepage recovery dams and modification in dam construction were advanced in an effort to reduce seepage through the dams and to capture said seepage. [See Ref. 9; Admin. FOF ¶¶ 10, 12, and 14]. Nonetheless, it was anticipated that some amount of water, largely runoff from Dams 1, 2, and 5, would make its way to Lake Superior by way of the Beaver River. It was also believed that some seepage would enter the groundwater and remain uncollected, and some degree of filtering through the soils was possible. It was also anticipated "a relatively small amount of water would seep through the ground underlying the tailings basin and be transported slowly with the groundwater beyond the seepage collection system and remain uncollected." [*Id.*; Admin. FOF at ¶ 38]. Therefore, water diversions were proposed downstream of the Dam 1 seepage recovery dam and additional studies were required to assess the water quality of uncollected seepage. [*Id.*; See Admin. FOF at ¶¶ 33,and 37-40].

- Fibers. The 1975-76 EIS indicates that fibers can be released to surface waters during operations and construction of the Mile Post 7 Project. [See Ref. 8 at 227].

- Dam Failure. A final, although not insignificant concern was the impact on water associated with catastrophic dam failure. Such a failure would significantly impact both the surrounding basin, the Beaver River downstream watershed, and Lake Superior principally from the flow of tailings-laden water resulting from such a release. [See Ref. 9; Admin. FOF at ¶ 41 and 42]. See Part 4.3.2.2.2 of this Determination for information around dam construction and safety at Mile Post 7.

4.3.2.3.2 New Information or Circumstances Regarding the Water Quality Impacts Available Since the 1975-76 EIS

The proposed dam extensions, retirement/relocation of the West Ridge Railroad, and continued westward progression of tailings, do not in and of themselves provide any potential for adverse water quality impacts different than those identified in the 1975-76 EIS. The implementation of the Proposed Project, if the proposed actions occur, do not require any new water quality measures or management infrastructure, but rely on continuation of, and potential additions to, the existing measures and systems already in place. This is also the case for the proposed clay borrow site, which is not expected to generate any substantial adverse water quality effects with implementation of best management practices.

Potential Water quality impacts are regulated under MPCA's National Pollutant Discharge Elimination System or NPDES permit. Originally three separate permits regulated water resources at Reserve Mining's Northshore facilities: one for the operation of the Mile Post 7 tailings disposal system; a second to regulate the Mile Post 7 water treatment plant and discharge to the Beaver River; and a third to regulate the non-contact cooling water discharge to Lake Superior and the discharge of process wastewaters to the Mile Post 7 Tailings basin from the Silver Bay Power Plant. These permits were reissued and/or transferred to new ownership under the Cyprus Mineral Company and Cyprus Northshore Mining Company jointly in August, 1989. The three permits were combined into NPDES/SDS Permit No. MN0055301, which was issued in September, 1996. [See Ref. 16 at 3].

In 2005, the MPCA re-issued NPDES/SDS Permit No. MN0055301 to the Proposer. [See Ref. 17]. The permit established eight (8) surface discharge stations, seven (7) of which are the sites where the Proposer is required to conduct water quality monitoring of effluent and stormwater coming from Mile Post 7. In addition to the surface discharge stations, the permit established 14 surface water stations, with 13 dedicated to monitoring water quality in streams and the Beaver River in the vicinity of the tailings basin. The specific mix of monitoring parameters at each station varies, but in general targets the constituents predicted to be present in tailings basin effluent and subject to treatment at the water treatment plant. MPCA anticipates initiating the permit reissuance process later in 2021. [See ERND Figure 7: Monitoring Locations].

Impacts Specific to Mile Post 7. In considering the current Proposed Project, it is necessary to understand any differences in anticipated water quality impacts compared to what was considered in the 1975-76 EIS. [See Ref. 8 at 227, 228]. Specifically:

- *Seepage.* At DNR's request the MPCA reviewed reports for all seepage monitoring locations. Monitoring at surface water location SW003 in the Beaver River downstream of the Mile Post 7 basin, as well as seepage recovery pond 1B, show relatively small increases in some constituents relative to upstream locations. It is possible that this is due to the discharge and/or potential seepage from the tailings basin. Though increased from upstream concentrations for some parameters, MPCA reports concentrations at SW003 remain well below water quality standards.

  The MPCA also reviewed groundwater monitoring data because groundwater could be impacted by seepage of impounded water at seepage recovery pond 1B. Parameters of note include specific conductance, concentrations of chloride, and Total Dissolved Solids or TDS, which are elevated relative to other seepage recovery wells at Mile Post 7. For TDS, instances do occur where concentrations slightly exceed groundwater standards, but in general these values are similar in magnitude to the values of the

same parameters in the basin water that would not be impacted by Mile Post 7. MPCA reports the TDS levels in wells immediately adjacent to the seepage recovery pond source are at times just above the secondary drinking water standards applicable to groundwater, but concentrations would decrease downgradient due to dispersion and dilution prior to reaching the property boundary and/or other locations where groundwater may discharge to surface water. Groundwater monitoring at seepage recovery ponds 1A, and downgradient of Dam 2, do not show the same elevated values.

The Proposer has identified that new seepage will result and require capture along the dam extensions, in particular along Dam 1, but anticipates infrastructure similar to existing features would accomplish the necessary impact control. In general, given that seepage will continue to be directed to the existing seepage recovery ponds under the Proposed Project, concern over groundwater concentrations associated with the extension of Dams 1 and 2 would remain commensurate with current levels at seepage recovery pond 1B. MPCA also reports little additional concern is expected at the other existing seepage recovery ponds, nor with the future west side seepage pond because the inferred hydrology along the proposed extension of Dam 1 should result in any seepage there behaving similar to existing sources. Monitoring will continue on the Mile Post 7 site and the Proposer plans to provide additional, limited seepage control infrastructure (similar to that already employed) once the elevation of deposited tailings reaches the area of the dam extensions. Overall, seepage from the basin/seepage recovery ponds would not be expected to substantially increase with the dam construction.

In considering the current Proposed Project, the MPCA indicates that the agency has not conducted an updated assessment of projected uncollected seepage rates since the EIS. However, given that the dam height remains consistent with the ultimate dam height in the EIS evaluation, MPCA would not expect that implementation of the Proposed Project to result in a substantial increase in uncollected seepage, or raise additional concerns about seepage water quality impacts to groundwater or receiving waters beyond existing conditions.

- *Stream Turbidity*. Implementation of the project would impact portions of Little Thirtynine Creek and Big Thirtynine Creek, both of which occur within the permitted tailings basin footprint originally evaluated in the 1975-76 EIS. A total of 8,570 linear feet of stream resource would be impacted, specifically:

    - Construction of the relocated railroad embankment, the Dam 1 extension and Dam 1 rail switchback would, result in 1,675 linear ft of stream impact.
    - Progression of the tailings basin would impact 3,368 linear ft of stream.
    - Portions of the two streams would be impacted by impoundment or the seepage pond pumphouse for 3,527 linear ft. [See Ref. 30 at 1-2].

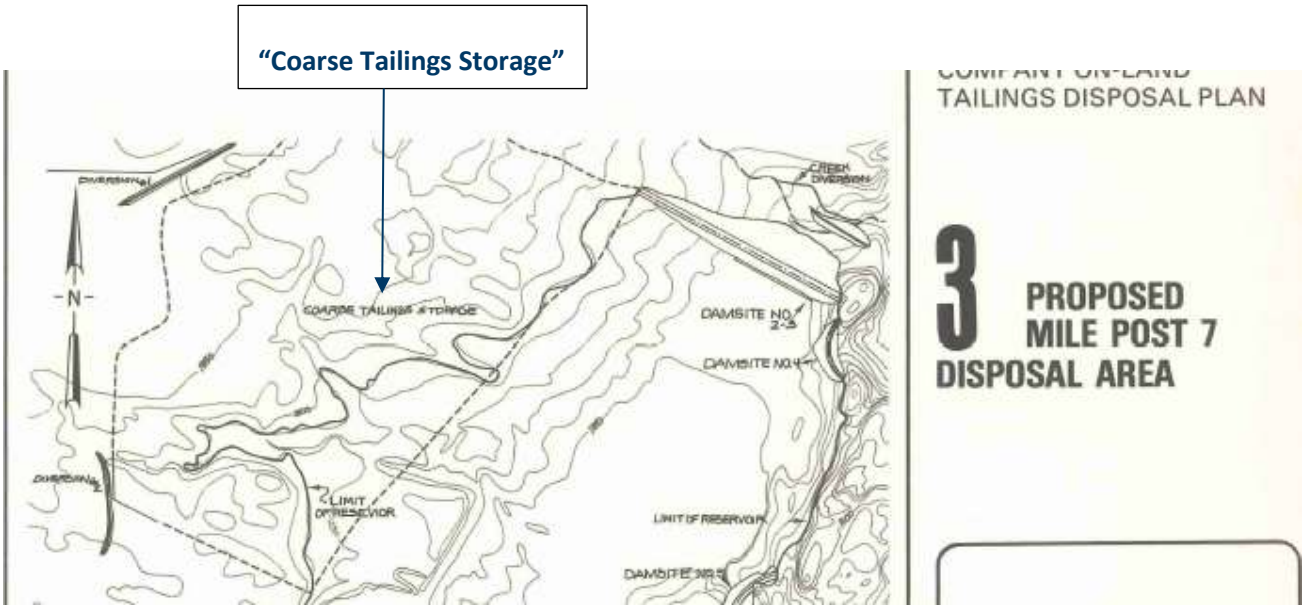
Before the Proposed Project can proceed, the MPCA is required to undertake a Section 401 Water Quality Certification. This is a component of the United States Army Corps of Engineers' (USACE) 404 permit also required for the Proposed Project. [See Refs. 29, 30, 31]. As part of the 401 certification process, the MPCA evaluated potential stream-related water quality impacts. A draft certification was placed on public notice in late 2020. The draft certification included requirements to: address total suspended solids (TSS) and turbidity; update stormwater pollution prevention plans (SWPPPs); identify and implement best management practice (BMP) mitigation measures to prevent water quality impairments; conduct

"diversion-related" water quality sampling; and implement a Stream Mitigation Plan. The MPCA has not identified any substantial concern with any diversion-related impacts with the Proposed Project. [See Ref. 21 at 1-7].

- Introduction of Chlorides. MPCA reports current chloride levels in the main tailings basin discharge are consistently in the 95-115 mg/L range, which is well below the applicable Class 2A Water Quality Standard of 230 mg/L. Because no new substantial sources of chloride will be used at the site (i.e. no changed circumstance), and there is no new information regarding the impact of chloride at the site, it is not necessary to determine whether the application of chloride may significantly affect the environmental effects of the Project.

- Pipeline Breakage. The Proposer has not identified the need for any other infrastructure, including pipelines. Because no new pipeline is proposed at the site, there is no potential for the Proposed Project to significantly affect the environmental effects of the Project regarding pipeline breaks and spills.

- Coarse Tailings Storage. The Project as originally conceived and evaluated in the 1975-76 EIS envisioned the storage of coarse tailings as depicted in the image below:



The Proposer reports coarse tailings storage has never occurred at the tailings basin and is not expected to occur as a result of the Proposed Project. The Proposer does indicate the possibility of some storage of coarse tailings above the physical tailings limit once dam construction comes to an end, but this will be addressed at the end of operations going into reclamation and closure. Because there is no new data, and there is not a change in circumstance pertaining to the storage of coarse tailings, it is not necessary to determine whether changes related to some amount of coarse tailings storage may significantly affect the environmental effects of the Project as studied in the 1975-76 EIS.

- *Fibers*. Concerns about fiber releases (as a function of monitoring) to adjacent surface waters are not expected to change as a result of implementation of the Proposed Project.

Conclusion. After reviewing the extensive documentation regarding water quality in the EIS and subsequent permitting actions, and the impacts of the Proposed Project, the DNR has determined that there is no new information or changed circumstances concerning water quality not studied in the 1975-76 EIS and addressed in subsequent water quality permitting that constitute new information or a change in circumstance that give rise to significant potential environmental effects from the Proposed Project that were not considered in the final EIS, or subsequent permitting premised thereon.

4.3.2.4 Fauna, Flora, and State-listed Species

4.3.2.4.1 Fauna, Flora, and State-listed Species Impacts Analyzed in 1975-76 EIS

The state passed legislation protecting endangered and threatened species in 1971 while the federal Endangered Species Act was passed in 1973. Although neither the federal nor the state endangered species legislation were specifically called out in the 1975-76 EIS, the EIS did contain an analysis of the potential impacts to species associated with the various alternatives examined in the EIS.

The 1975-76 EIS identified 64 state listed animal species that merited "special consideration." The EIS cited the document: "Minnesota animals and plants in need of special consideration, with suggestions for management, Special Publication No. 104, 1974" (hereinafter Spec. Pub. No. 104)]. [See Ref. 8 at 147]. These species fell within the following state listing status categories: endangered species; threatened species; species with change or uncertain status; and species of special interest. The EIS identified 21 animals (excluding fish) that could be found in northeastern Minnesota in the vicinity of the various alternatives. This list included 13 bird species, 5 mammal species, one reptile species, and two amphibian species. Plant species meriting special consideration were not expressly identified in the EIS. [*Id.*].

The primary impact to these species was that of habitat loss at the site of the various alternatives under consideration. For example, the loss of wetland habitat was predicted to impact the two amphibian species. Of significant concern was the impact of the loss of nesting habitat to the various bird species. Because the habitat and fauna at the Mile Post 7, Colvin, and Embarrass site was similar, development at these alternatives were projected to have a significant impact on the nesting habitat of the mourning warbler and Connecticut warbler. The two species of mammals expected to be impacted by all alternatives were moose and gray wolves. The Mile Post 7 alternative in particular was expected to have the greatest impact on moose populations. [*Id.* at 149].

Although the 1975-76 EIS did not specifically identify specific species of flora that would be impacted by the various alternatives, the document did state that at any of the alternative sites there would be a complete elimination of vegetation. This loss of site vegetation would result in both reduced soil stability and soil nutrient cycling. At the Mile Post 7 site, the establishment of a tailings basin would cause a complete loss of forest cover on the Project site. Tree species lost would include unmarketable stands of sugar maple, and marketable stands of mature aspen, birch, and balsam poplar. This equated to the loss of approximately 4,842 acres of land from fiber production. These impacts could possibly be ameliorated at reclamation and closure of the basin if reclamation included returning the site to fiber production by being incorporated into the rehabilitation plans. [*Id.* at 233-234].

4.3.2.4.2 New Information or Changed Circumstances That May Affect Potential State-listed Species Impacts of the Proposed Project That May Have Not Been Studied in the 1975-76 EIS

DNR confirmed the Proposer's review of the DNR Natural Heritage Information System (NHIS) database to identify state-listed endangered species, threatened species, or special concern species located within a one-mile radius of the Mile Post 7 tailings basin, including the site of the proposed dam extensions, railroad relocation, and the clay borrow site. The outcome of this search was documented in two separate reports dated March 31 and April 14, 2021, respectively. [See Refs. 5 and 6].

In the vicinity of the unused portion of the tailings basin the database indicated the potential presence of:

- Bald Eagle. *Haliaeetus leucocephalus*. This bird species has no federal status and its state status is "delisted." The bald eagle is, however, a watchlist species in Minnesota. A bald eagle record was documented in 2000 and is located near the west-central edge of the current extent of the tailings basin. A field survey was conducted in 2015 and no bald eagle nests were observed.
- Twig Rush. *Cladium mariscoides*. This plant species is designated as special concern species by Minnesota and enjoys no special protection under Minnesota's endangered and threatened species statute. Nonetheless it is a rare species whose occurrences are tracked by DNR. It is not a federally listed species. This species was identified during a site survey in 2015.
- Neat Spikerush. *Eleocharis nitida*. This plant species is designated as special concern species by Minnesota and enjoys no special protection under Minnesota's endangered and threatened species statute. Nonetheless it is a rare species whose occurrences are tracked by DNR. It is not a federally listed species. This species was identified during a site survey in 2015.

In the vicinity of the proposed clay borrow site, the database indicated the potential presence of:

- Intermediate Sedge. *Carex media*. This species designated as special concern species by Minnesota and enjoys no special protection under Minnesota's endangered and threatened species statute. It is not a federally listed species. It is generally found at or near Lake Superior, however, an inland population was found in a location along a north facing cliff away from the lake, which matches the life history of a species that relies on water seeps from seams and crevices on cliffs. The clay borrow site is 2.3 miles from Lake Superior with no cliffs or suitable rock crevices of the type that provide habitat to this species. The proposed borrow site has a south-facing aspect with a gradual slope (3-4%). The presence of this species at the proposed clay borrow site is highly unlikely.
- Alpine Woodsia. *Woodsia alpina*. This species is designated as threatened under Minnesota's endangered and threatened species statute. Minnesota Statute § 84.0895 prohibits a person from taking or possessing an endangered species unless that person has first obtained a take permit from the DNR. This species is not protected by the federal Endangered Species Act. This species is generally found in crevices and on small ledges on moist and partially shaded cliffs, typically with circumneutral to weakly alkaline bedrock. It is typically found along Lake Superior, but inland populations are known to occur. The project area has a south-facing aspect with a gradual slope (3-4%) and does not have suitable habitat for this species.

DNR's Natural Heritage Program has determined "given that no state-listed threatened or endangered species were found during either survey, impacts to state-protected plants are not anticipated and a takings permit is not needed to proceed with the project." This determination covers activities at both the tailings basin and clay borrow site.

Conclusion. After reviewing the species documentation in the EIS, the impacts of the Proposed Project, and the determination made by DNR's Natural Heritage Program, the DNR has determined that there is no new information or changed circumstances concerning state-listed species not studied in the 1975-76 EIS.

4.3.2.5 Air Quality

4.3.2.5.1 Air Quality Impacts Analyzed in the 1975-76 EIS

The 1975-76 EIS identified particulate emissions as the primary air impact at the site. These emissions would occur whenever dry earth or tailings were exposed to the atmosphere and subjected to wind or other actions causing fugitive dust. During construction fugitive dust may be caused by: 1) wind erosion of cleared lands; 2) material movement during construction of access roads, dams, and plant facilities; and 3) vehicular traffic. During operations, the major sources of fugitive dust is: 1) wind erosion of dry tailings around the basin perimeter; and 2) vehicular traffic on roads. [See Ref. 8 at 257].

Particulate emissions are estimated by measuring the total suspended particulates (TSP) in the air. An air dispersion model is applied to determine the airborne concentrations of particulates at a given population center (i.e., city). Silver Bay, MN, is the population center of interest for Mile Post 7. Tables 101 and 102 of the 1975-76 EIS listed the predicted TSP concentrations for all EIS alternatives, which assessed the project against the primary standard and non-degradation standard for particulate air quality. [See Ref. 8 at 258]. The 1975-76 EIS determined that the anticipated TSP concentration during construction and operation for the Mile Post 7 alternative would not exceed the primary standard of 75 $\mu g/m^3$. However, the TSP concentration during both construction and operation for the Mile Post 7 alternative would exceed the non-degradation standard of 10 $\mu g/m^3$, where non-degradation standard applies to geographic areas that did not exceed national air quality standards at the time of the EIS. [*Id*. 8 at 257-258].

The 1975-76 EIS also modeled predicted concentrations of asbestiform fibers associated with each of the alternatives. In 1975 there was no recognized ambient air quality standard for safe concentrations of asbestiform fibers. The 1975-76 EIS concluded that the fugitive emissions at all of the site alternatives would contain asbestiform fibers. [*Id*. at Table 103]. For the Mile Post 7 alternative, the average asbestiform fiber content of TSP emissions, reported as percent of emissions generated by weight, was 5% during construction and 12% during operation. This meant that, without mitigation measures, there would be a predicted representative increase in mass concentrations of asbestiform fibers at population centers of 1 $\mu g/m^3$, which corresponds to an asbestiform fiber concentration of 6×10^6 fibers per cubic meter of air. [*Id*. at 257-258].

Air quality impacts associated with the proposed Mile Post 7 Project were also an important topic during the EIS Administrative Hearing leading to the following conclusions:

- Asbestiform Fibers Air Quality Effects. Construction and operation of the Mile Post 7 tailings basin would distribute asbestiform fibers beyond the tailings basin. [See Ref. 9; Admin. FOF at ¶ 44]. Expert testimony

at the hearing estimated that at Silver Bay, MN, there could be asbestiform fiber ambient air content of 900,000 fibers per microgram to 2,900,000 fibers per micrograms. [*Id.*; Admin. FOF at ¶ 70]. The Administrative Law judge concluded at the close of the hearing that at Silver Bay there was no evidence fiber concentrations would be "below a medically significant level. . . [because of] the combined effects of reduced stack emissions and implementation of the Mile Post 7 disposal area." [*Id.*; See Admin. FOF at ¶ 74]. Because some fibers would reach Silver Bay from Mile Post 7, this negated some benefit of planned emission controls at the processing plant. [*Id.*; See Admin. FOF at ¶ 72]. The Administrative Law Judge concluded "…There is no evidence that the fiber concentrations emanating from Mile Post 7, even after installation of planned emission controls, would be medically insignificant. [*Id.*; Admin. Conclusions at ¶ 1].

- Comparison of Air Impacts in Silver Bay Across the EIS Alternatives. Based on an analysis and comparison of the air emission impacts of each of the alternatives, it was determined that TSP levels in population centers, including potentially hazardous fibers, would be greatest if the Mile Post 7 alternative was selected. Specifically air emission impacts at Silver Bay would be three times higher from the Mile Post 7 alternative than from the Midway alternative. Additionally, existing fibers levels at Babbitt made the remaining Embarrass, Colvin, and Snowshoe sites "less desirable" without mitigation measures instituted at existing emissions sources. [See *Id.*; Admin. FOF at ¶ 98].

4.3.2.5.2 New Information or Circumstances Regarding the Air Quality Impacts Available Since the 1975-76 EIS

MPCA Air Permit No. 07500003-010/-101. The Proposer's mining and processing operations received its first air permit in 1972. The current operating permit for operations at Silver Bay and Mile Post 7 was issued on February 24, 2004. This permit has been subject to major, moderate, and administrative amendments a number of times.

Fugitive dust emissions from Mile Post 7 are currently regulated under MPCA Air Permit No. 07500003-010/-101 (MPCA Air Permit) issued in May/June 2013. [See Refs. 18 and 19]. Specifically:

- Amendment-010 includes extensive conditions to regulate fugitive dust emissions, setting out conditions governing: 1) Air Control Technology; 2) Tailings Disposal and Stabilization; 3) Exposed Coarse Tailings – Wetting; 4) Exposed Coarse Tailings – Splitter Dikes, Railroad Roadbeds, Dams; 5) Exposed Coarse Tailings – Vegetation and Treatment; 6) Treatment Technology; and 7) Air Quality Limits). The ambient air boundary for the MPCA Air Permit is set at the property boundary. [See Ref. 18; Appendix B at 1-3].
- Amendment-101 replaces pages 2-3 of Appendix B in Amendment-010 for Condition (7) Air Quality Limits and Condition (8) Definitions. [See Ref. 19 at 1].

The MPCA Air Permit addresses the following issues:

- Total Suspended Particles (TSP). The MPCA adopts the primary and secondary TSP standards analyzed in the 1975-76 EIS i.e a primary standard of 75 µg/m^3 and a secondary standard of 10 µg/m^3. To control TSP, the Proposer has adopted a fugitive dust control plan. The plan was last updated as part of the facility's 2019-2023 Five Year Operation Plan. The Plan specifies methods of controlling dust associated with plant aggregate surfaces and on fine tailings beaches (above the pond). [See Ref. 26; Section 4.4 at 12].

- Particulate Matter. Since 1976, Particulate Matter <10 μg/m^3 (PM10) and Particulate Matter <2.5 μg/m^3 (PM2.5) have been designated as criteria pollutants. The MPCA Air Permit requires the Proposer to undertake ongoing ambient air monitoring to assure compliance with the emission level requirements for these criteria pollutants. [See Ref. 18; Exhibit M at 1-14]. The permit conditions require monitoring Particulate Matter at the Total Facility Level and establishes ambient air monitoring procedures to demonstrate compliance of State and Federal ambient air quality standards or permit conditions. [*Id.*]. A PM_{10} monitor is in place at the Mile Post 7 site. The results of ongoing monitoring are reported to the MPCA. Data from the MPCA indicates that the Mile Post 7 facility has been and continues to be in compliance with the established Particulate Matter emission criteria.

- Fibers. The MPCA Air Permit also regulates the asbestiform fibers. [See Ref. 19; Table A at A-7a-c]. The MPCA Air Permit set a permit level for fibers at an Action Level for fibers of less than or equal to 4,000 fibers/m^3 for the facility. [*Id.*; Attachment 1]. "Action Level" means "[i]f the concentration of fibers in the nearby communities of Silver Bay and Beaver Bay increase to levels greater than or equal to the Action Level, the amendment requires actions be taken by the facility to attempt to prevent and control the release of Minnesota fibers until the ambient concentrations are below the Action Level." [*Id.* at "8"]. This is based on a 365-day rolling geometric mean. Two monitoring site, F1 and F7, have been established onsite to monitor for these fibers. Results from this monitoring are reported to the MPCA. [See Ref. 18, Table A at A-7a and A-7b]. MPCA reports the current permitted levels are significantly below the concentration levels identified in the 1975-76 EIS.

There is no change in air emission information that pertains to the Mile Post 7 tailings basin. The TSP, Particulate Matter, and Fiber standards remain unchanged and monitoring data indicates that the facility has remained in compliance with the standards imposed in the MPCA Air Permit. Nor has there been a change in the ambient air boundary for the Mile Post 7 tailings basin.

The only changed circumstance identified by DNR is the proposed dam extensions, and retirement/relocation of the West Ridge Railroad, that will allow use of the remaining capacity of the tailings basin. The air quality emission impacts associated with the storage of tailings in the tailings basin up to its maximum capacity was studied in the EIS and continues to be regulated by the MPCA Air Permit. No modification of the MPCA Air Permit is required to continue the placement of tails in the tailings basin. The MPCA has also determined that construction and operation of the proposed dam extensions and retirement and relocation of the West Ridge Railroad will not substantially impact air emissions. Adverse air quality impacts associated development of the clay borrow site is not anticipated.

Conclusion. After evaluating 1975-76 EIS, the MPCA Air Permit, current air emission standards, and the available associated air data, the DNR has concluded that there is no new information or changed circumstances relating to the air impacts of the Mile Post 7 Project that were not studied in the original EIS and subsequently incorporated in the MPCA Air Permit for the Mile Post 7 Project. A supplemental EIS is, therefore, not required to address new information or changed circumstances to analyze the potential air impacts of the Mile Post 7 Proposed Project and the proposed modifications thereto.

4.3.2.6 Surface Water Discharge

4.3.2.6.1 Surface Water Discharge Impacts Analyzed in the 1975-76

As discussed more fully in Part 4.3.2.3.2 of this Determination, the 1975-76 EIS analyzed water quality impacts associated with the various tailings basin alternatives as well as those specific to the construction, operation, reclamation and closure of the Mile Post 7 Project. Specifically, the 1975-76 EIS analyzed the: potential for stream turbidity associated with diversion of Big Thirtynine Creek, Little Thirtynine Creek and the diversion of unnamed creek; potential water quality impacts of using chlorides at the site; and the chemical composition of potential seepage from the tailings basin, including but not limited to abestiform fibers. [See Ref. 8 at 228].

Of note the Project evaluated in the 1975-76 EIS did not anticipate any surface water discharge at Mile Post 7. A water recycling system was proposed to remove and use any excess water available at the Mile Post 7 tailings basin. Infrastructure to accomplish this included a floating pumphouse that would direct water through a 24-inch water reclaim pipeline to the processing plant at Silver Bay for reuse. Seepage from the basin to adjacent surface water and groundwater resources was predicted through the tailings, but this was not considered a surface water discharge in terms of impacts or regulation. As such, the 1975-76 Draft EIS did not evaluate potential surface water discharges as a result of future basin operations.

4.3.2.6.2 New Information or Changed Circumstances That May Affect Potential Surface Water Discharge Impacts of the Proposed Project That May Have Not Been Studied in the EIS.

Unanticipated Production Slowdown. The Project assessed in the 1975-76 EIS relied on a closed-loop water recycling system designed to collect water at the tailings basin, including seepage, and pipe it back to the Silver Bay Plant for use in ore processing. [*Id*. 8 at 17]. Coincidently during the EIS and early years of project construction, there was a downturn in the steel market that "imposed upon the Reserve Mining Company a level of production below those projected" behind the Project design. [See Ref. 28 at 1].[2] This reduction occurred while the Mile Post 7 dams and seepage collection systems were under construction. This production reduction meant that the Silver Bay Plant did not have the need for the amount of water that was anticipated in the 1975-76 EIS, which led to water levels in the Mile Post 7 basin to begin "rising faster than the dams [could] be constructed at [then] current operating level…[and] it has become necessary to discharge some portion of water stored in the basin." [*Id.* at 1-2]. In response, Reserve Mining conducted preliminary engineering in 1984 to address the water build-up in the tailings basin. The outcome of that study was a recommendation to add a water treatment facility at Mile Post 7 that could treat excess water and discharge it into the Beaver River. [*Id.* at 2].

NPDES Permitting. Shortly thereafter in 1985, a permit was issued to Reserve Mining for the construction of a water treatment facility. In fact, the MPCA issued three separate permits to Reserve Mining in 1985 regulating water resources at Reserve Mining's Northshore facilities: one for the operation of the Mile Post 7 tailings disposal

[2] See Tarr, D. 1988. "The Steel Crisis in the United States and European Community: Causes and Adjustments." National Bureau of Economic Research. University of Chicago Press. 26 pgs.

system; a second to regulate the Mile Post 7 water treatment plant and discharge to the Beaver River; and a third to regulate the discharge of non-contact cooling water from the Silver Bay Power Plant to Lake Superior and the discharge of process wastewaters from the Silver Bay Plant to the Mile Post 7 Tailings basin. [See Ref. 16; MPCA Record of Decision; Facility History – Permitting History ¶ 9]. These permits were reissued and/or transferred to new ownership the Cyprus Mineral Company and Cyprus Northshore Mining Company in August, 1989, when that company acquired the assets of Reserved Mining. [*Id.*]. The three permits were subsequently combined into a single MPCA NPDES/SDS Permit No. MN0055301 (MPCA NPDES/SDS Permit), which was issued in September, 1996. [*Id.*].

In 2005 the permit was again reissued as MPCA NPDES/SDS Permit MN0055301. [See Ref. 17]. This permit continues to govern water quality at the Mile Post 7 site. This global permit regulates not only the water quality of the treatment plant effluent, but also the monitoring requirements for all other potential sources of impacts to surface water and groundwater resources at Mile Post 7 and the Silver Bay processing facility. [*Id.*].

MPCA anticipates initiating the permit reissuance process NPDES/SDS Permit No. MN0055301 later in 2021.

Changes to Water Quality Standards. DNR requested and the MPCA provided a high-level review of the significant changes to the MPCA water quality standards since 1985, some or all of which could be potentially applicable to the Mile Post 7 Project through the NPDES/SDS Permit. These changes, together with the approximate year they were adopted, are listed below:

- Major revision to non-degradation provisions of the standards (1988)(updated 2018 to reflect new methodologies)
- Human health water quality standards (toxicological and exposure methodologies)(1990)(updated (2018)
- Narrative wetland standards (1994)
- Minn. R. Ch. 7052 Lake Superior Water Basin Standards including bioaccumulative parameters of concern (e.g., 1.3 ng/L WQS for Hg) (1998)
- Fish Tissue Mercury water quality standards (2008)
- Lake and River eutrophication water quality standards (2008)
- Tiered Aquatic Life Uses (TALU) water quality standards (i.e. biological standards) (2018)

Water Treatment Plant. A water treatment plant was added to the Mile Post 7 tailings basin facility in 1985. It was designed to remove excess water from the tailings basin, treat it, and discharge it into the Beaver River. It was located south of the east-end of Dam 1, which is detailed in the image below. See ERND Figure 8: Post-EIS Facilities.

The water treatment facility went online in 1985 and discharged into the Beaver River. [See Ref. 26 at 14]. In 2007, the water treatment facility was upgraded by adding additional treatment lines thereby increasing the facility's capacity. Since the 2007 upgrade, the normal treatment rate ranges from 2,500 to 3,500 gpm, but rates as high as 4,200 gpm have been recorded. These treatment flows have maintained basin water levels within acceptable engineering norms. [*Id.* at 14.] Regarding the facility water balance, the Proposed Project does not substantially change the current facility water balance. DNR notes the water balance changed from the EIS estimates to account for the excess water accumulating in the tailings basin; this has been incorporated into the facility water balance since 1985. [See Ref. 4].

At the time the facility was constructed in 1985, the discharge guidelines for the water treatment facility were set in the MPCA NPDES/SDS Permit and associated documents. These guidelines were used to specify the facility design and treatment for the following constituents: amphibole fibers; chrysotile fibers; and fluoride. The fibers originate from the tailings materials placed in the tailing's basin. The fluoride is a byproduct of the beneficiation process that releases small amounts of fluoride to the process water. [See Ref. 28 at 3-7]. Flocculation and filters were to be used to treat the water to assure that water met the indicated effluent targets. [*Id.* at 14].

MPCA NPDES/SDS Permit No. MN0055301 Requirements. The following discussion addresses how the water quality permit regulates surface water discharges from the Mile Post 7 tailings basin. Specifically:

- Monitoring Stations. The tailings basin water treatment plant and related water management infrastructure are operating under the conditions of the existing MPCA NPDES/SDS Permit. The permit established eight (8) surface discharge stations. The Proposer is required to monitor effluent water quality and stormwater coming from Mile Post 7 at seven (7) of these discharge stations. In addition to the surface discharge stations and associated monitoring, the MPCA NPDES/SDS Permit establishes 14 surface water stations, 13 of which are dedicated to monitoring water quality in surrounding streams and in the Beaver River near the tailings basin. [See Ref. 17 at 9, 12-24]. See ERND Figure 7: Monitoring Locations.

- Monitoring Parameters. The MPCA NPDES/SDS Permit contains a mix of monitoring parameters used to assess discharge from the water treatment facility, and seepage related discharges, for compliance with state and federal water quality standards. The list of monitoring parameters has increased over the life of the Mile Post 7 Project. These changing parameters reflect the MPCA's improved understanding of the tailings chemistry, site-specific issues, and/or other factors around general water quality regulations for groundwater and receiving surface waters. The specific mix of monitoring parameters at each monitoring station varies, but in general these parameters target the constituents predicted to be present in tailings basin effluent and subject to treatment at the water treatment plant.

  The MPCA NPDES/SDS Permit established SD001, which is the water treatment plant discharge point to the Beaver River, as the main monitoring station for overall water quality. Twenty-one (21) parameters are monitored under various sampling conditions. [See Ref. 17 at 17-18]. In addition to SD001 at the water treatment plant discharge, the permit established SD002, SD006, and SD008 to focus on a single important parameter each. SD002 is dedicated to measuring turbidity, SD006 is dedicated to measuring fibers, and SD008 is dedicated to measuring fluoride. [*Id.* at 18, 20].

Turbidity. WaterLegacy, in its comment letter on the proposed Permit Amendment, raised concerns that "[b]y 1996, the Beaver River was found to be impaired from its headwaters to Lake Superior for aquatic life due to turbidity." WaterLegacy further notes the presence of the direct discharge of industrial wastewater from Mile Post 7 to the Beaver River. [See Ref. 33 at 15].

Turbidity is caused by particles suspended or dissolved in water that make the water appear cloudy or murky. To address the Project as a source of turbidity in the Beaver River, a primary purpose of the waste water treatment facility is the removal of suspended solids from the effluent stream prior to discharge to natural waters (at SD001). Accordingly, the MPCA water quality permit includes turbidity monitoring requirements for monthly sampling to compile a calendar month average and daily maximum for this constituent. [See Ref. 17 at 17-18]. The MPCA reports that since at least 2015, the water treatment plant discharge has consistently complied with the 3.0 Nephelometric Turbidity Unit or NTU calendar monthly average effluent limit, and the 0.4 NTU instantaneous maximum intervention limit. Because there is no new information or change in circumstances related to instream turbidity at the site, it is not necessary to determine whether the Proposed Project may significantly affect the environmental effects of the Project as studied in the 1975-76 EIS. In addition, the Proposed Project is not predicted to have any effect on the potential for turbidity originating from Mile Post 7.

Fibers. WaterLegacy, in its comment letter on the proposed Permit Amendment, raised concerns about changes in the number of amphibole fibers allowed in the permitted discharge from Mile Post 7. The letter notes violations of the discharge limit, with exceedances as high as 32.6 million fibers per liter, which enter the Beaver River and "flow downstream to Lake Superior." [See Ref. 33 at 16].

Since 1985, the MPCA water quality permit has included an effluent limit for total amphibole fibers contained in the discharge from the water treatment facility. Since this effluent limit is based on Best Available Technology or BAT, it has changed over time and is currently set at 6.8 million fibers per liter (MFL). [See Ref. 17 at 20]. The MPCA NPDES/SDS Permit requires monitoring for the following types of fibers at stations SD006, as well as SW011 and SW014: Ambiguous; Amphibole; Chrysotile; Non-Amphibole Non-Chrysotile; and Total. Grab samples are taken at various frequencies, ranging from single values to monthly depending on the location. [*Id.* at 20, 23-24]. Fiber samples are also taken at several locations in surface waters adjacent to the facility. MPCA reports the sampling results from these locations have been variable over time with no identified correlation with basin activities.

A March-2015 Schedule of Compliance enforcement action issued by the MPCA for violation of the fibers effluent limit cited 11 limit violations between 2010 and 2013. The frequency and severity of fiber effluent limit violations has substantially decreased since the enforcement action. Since 2015, the discharge from the water treatment plant at SD006 has averaged 3.1 MFL, with only a single value above the 6.8 MFL limit. The MPCA determined that this single, low level exceedance did not merit bringing a corrective action to address the violation because of the infrequency of occurrence and lack of severity for this instance.

Because there is no new information or changed circumstances regarding fibers, and the presence of fibers were extensively evaluated in the 1975-76 EIS and continue to be monitored, and because samples taken at the site remain within the permitted parameters, it is not necessary to determine whether the Proposed Project significantly affects the environmental effects of the Project.

Fluoride. WaterLegacy, in its comment letter on the proposed Permit Amendment, raised concerns about USEPA's 2016 comments to MPCA on a Pre-Public Notice Draft NPDES permit for Northshore-Silver Bay regarding fluoride. [See Ref. 33 at 16]. WaterLegacy further notes potential adverse effects of excessive fluoride in drinking water, along with noting the "discharge of fluoride to the Beaver River (SD001 and SD008) has repeatedly violated permit limits for the past 15 years." [*Id.*]

Fluoride is understood to be a byproduct of the beneficiation process at the Silver Bay processing facility. [See Ref. 28 at 7]. Chemical coagulation and flocculation followed by direct filtration, under the proper operation, could meet water quality standards regarding fluoride. [See Ref. 16; Issue Statement at 5]. The MPCA NPDES/SDS Permit requires monitoring for fluoride at outfall SD0008. The monitoring is for Total Fluoride (as F) and is taken as a grab sample twice monthly, reported as both a calendar month average and daily maximum. The Proposer must report also the "twelve-month average fluoride results" to the MPCA annually. [See Ref. 17 at 20].

MPCA reports the NPDES/SDS Permit includes a compliance schedule for fluoride with a number of required actions. The permit requires compliance with intermediate limits based on the primary drinking water standard of: 5.9 mg/l daily maximum, and a 4.8 mg/l monthly average, by December 2010. [*Id*.; Chapter 11, Section 17.13, at 65]. MPCA indicates the most recent violation of the calendar month average was August 2015, while the most recent violation of the daily maximum limit was March 2014.

Subsequent investigations into the source of fluoride conducted by the Proposer have identified operations at the pellet plant as the primary source of fluoride. The data does not point to the disposal of tailings in the basin as the source of fluoride. Regarding the Proposed Project, because it will not result in a change in pellet plant operations, additional water quality effects around fluoride are not expected as a result of implementation of the Proposed Project.

Although not addressed in the EIS, the presence of fluoride in the process water is an issue that was known and considered during the 1984 design of the water treatment plant, and subsequently addressed with monitoring and reporting conditions incorporated into the 1984 and subsequent 2005 NPDES/SDS Permits for this constituent. The current permit contains a compliance schedule where MPCA reports no violations have occurred since August 2015. Because there is no new information or changed circumstances regarding fluoride around the Proposed Project, and the issue is understood and continues to be monitored, it is not necessary to determine whether the Proposed Project significantly affects the environmental effects of the Project.

Specific Conductance. WaterLegacy, in its comment letter on the proposed Permit Amendment, raised concerns about the levels of specific conductance discharged at Mile Post 7, which "are high enough to extirpate sensitive aquatic insects and fish." [See Ref. 33 at 17].

The MPCA NPDES/SDS Permit requires the Proposer to monitor specific conductance in the water treatment plant discharge effluent at SD001. This takes the form of a grab sample taken twice monthly over each year of operation at SD0001. Both a daily maximum value and calendar month average are generated from the data. [See Ref. 17 at 18]. In particular, the MPCA NPDES/SDS Permit not only requires monitoring for specific conductance at the water treatment plant (SD001) but also the following locations: GW001; GW002; GW004; GW005; GW006; GW007; GW008; GW009; GW010; GW011; GW012; GW013; SD005; SW001; SW002; SW003; SW004; SW006; WS001; WS003; WS004; WS005; WS006; and WS012. These too are to be grab samples at varying frequencies as a function of location. [*Id.* at 12-18, 20-23, 25-26, 28-29].

MPCA reports the data from these samples indicates that specific conductance in the main water treatment plant discharge is generally in the range of 800-950 umho/cm, and in the range of 400-500 umho/cm at SD005. Values in groundwater downgradient of seepage recovery pond 1A and Dam 2 are generally less than 300 umho/cm (and similar to or less than values at background wells), but up to around 900 umho/cm downgradient of seepage recovery pond 1B. MPCA also reports specific conductance values in surface water downstream of the discharge are quite variable ranging from less than 100 to over 600 umho/cm. These discharge and surface water results are well below the Class 4A water quality standard of 1000 umho/cm. In addition, the water treatment plant effluent has consistently passed toxicity testing protecting the Class 2A toxicity narrative standard.

Because there is no new information or change in circumstances related to specific conductance at the site, it is not necessary to determine whether changes in specific conductance may significantly affect the environmental effects of the Project as studied in the 1975-76 EIS.

Sulfate. WaterLegacy, in its comment letter on the proposed Permit Amendment, raised concerns about sulfate that might result from mining and subsequent processing of Type II VF rock at the Peter Mitchell Pit. [See Ref. 33 at 18, 21].

The MPCA NPDES/SDS Permit requires monitoring for sulfate in the water treatment plant effluent at SD001, as well as at various groundwater (GW), surface water (SW), surface discharge (SD), and waste stream (WS) stations. [See Ref. 17 at 12-29]. Sulfate monitoring data collected by the MPCA since 2015, when the Proposer began mining in the area of the Peter Mitchell Pit containing Virginia Formation rock, was reviewed as part of this need determination analysis. That data indicates that since 2015, sulfate concentrations in the main discharge from the tailings basin have generally ranged from approximately 55 to 75 mg/L. This is below the Class 1B water quality standard of 250 mg/L for the Beaver River.[3] Data collected from sampling location SD005 over that same time period ranges from about 4 to 6 mg/L sulfate, well below the Class 1B water quality standard for sulfate. Concentrations of sulfate in downgradient groundwater monitoring wells are typically below 25 mg/L, again significantly below sulfate standards.

Thus in the unlikely event that some small amount of Virginia Formation rock should find itself shipped to Silver Bay, the resulting impact on water quality would be *de minimus* as evidenced by monitoring data at the tailings basin site since 2015. Consequently although the fact that the Proposer is mining into the Virginia Formation rock represents a change in circumstances, this changed circumstance does not significantly affect the environmental effects of the Project. Therefore this changed circumstance does not form the basis for a supplemental EIS.

Mercury. WaterLegacy, in its comment letter on the proposed Permit Amendment, raised concerns about USEPA's 2016 comments to MPCA on a Pre-Public Notice Draft NPDES permit for Northshore-Silver Bay related to mercury. [See Ref. 33 at 16].

USEPA's Comment 6 focused on a level of mercury detected at outfall SD005 at 2.3 nanograms per liter (ng/L). WaterLegacy further notes mercury levels at WS006 up to 40 micrograms/liter, "which is the waste stream where Coherex dust-suppresant is applied." [*Id.*].

[3] The sulfate standard for wild rice waters is 10 mg/L. The receiving surface water feature, the Beaver River, is not a Class 4A wild rice water and, therefore, the 10mg/L wild rice sulfate standard does not apply.

As discussed in greater detail in Part 4.3.2.5.2 of this Determination, during environmental review and in the environmental review document, there were extensive discussions about the deposition of asbestiform fibers originating from fugitive dust. Suppression of dust was deemed a primary mechanism to prevent asbestiform fibers from becoming airborne. Coherex has been used nationally as a dust suppressant since at least the 1950s, and is used at the Mile Post 7 tailings basin to suppress dust. Coherex contains low levels of mercury.

Beginning in 2004-05, the MPCA NPDES/SDS Permit required annual sampling of the dust suppressant Coherex, as applied at the facility. [*Id*. at 28]. MPCA reports results of the sampling over the past 10 years indicate that mercury levels have been below the sample reporting limit. However, to minimize the risk of adverse effects to surface waters from Coherex, the MPCA/NPDES Permit includes provisions prohibiting the application of Coherex within 100 feet of surface waters, and requires that it be applied in a manner that does not result in surface runoff. [*Id.* at 52]. The MPCA NPDES/SDS Permit also includes an annual limit on the volume of Coherex that may be applied at the Mile Post 7 site. [*Id.* at 73]. Any change in circumstances regarding the application of this dust suppressant has been to place constraints on the manner of its use to assure that constituents from Coherex do not find their way to surface or groundwater.

The MPCA NPDES/SDS Permit also includes provisions for monitoring the water treatment plant effluent for Total Mercury (as Hg) monthly at SD001, which is located at the Mile Post 7 Pipe Outfall 010. Monitoring for Total Mercury is also required annually at WS006 – this monitoring site is specifically designed to monitor for Mercury concentrations associated with the roadway application of Coherex. [*Id*. at 17-18, 27-28].

WaterLegacy asserts that the application of the Coherex dust-suppressant has the potential to raise mercury levels at WS006. No data was provided to substantiate this claim. [See Ref. 33 at 16, 18]. MPCA reports results of the sampling over the past 10 years indicate that mercury levels have been below the sample reporting limit. Regarding the water treatment discharges, monitoring data from the MPCA indicates that since at least 2015, the highest mercury value in the discharge from the water treatment plant effluent has been 0.8 ng/L, well below the water quality standard of 1.3 ng/L for the Lake Superior basin. Because the Proposed Project is not expected to result in a substantial change in the operation or efficiency of the water treatment plant or its discharge, there is no concern around mercury levels in the discharge from implementation of the Proposed Project. Consequently the claim made by WaterLegacy around mercury or Coherex does not constitute either new information or a change in circumstance and it is, therefore, not necessary to determine whether the application of Coherex may significantly affect the environmental effects of the Project.

The USEPA, in its comment on the MPCA's *2016 Pre-Notice Draft Permit* for its MPCA NPDES/SDS Permit, expressed concern around the lack of a reasonable potential analysis (to determine any need for a water quality based effluent limit) related to a mercury level of 2.3 ng/L reported at SD005. [See Ref. 32 at 2]. The MPCA has been collecting data at SD005 under the original permit issued in 1985. The MPCA reports very limited data for mercury concentrations at SD005 exist because SD005 is a relief well, which has relatively low flows (i.e., 2000 gpm/day) that is used to monitor seep flows. Routine monitoring for mercury at this location is not required by the current MPCA NPDES/SDS Permit. The single value noted in USEPA's comment is slightly above the applicable water quality standard for the receiving water. At the request of MPCA, the Proposer monitored SD005 for mercury in March 2021 and reported a value of 0.506 ng/L, which is below the water quality standard of 0.8 ng/L. Further, though not directly indicative of water quality at SD005, quarterly monitoring results since at least 2010 for the main discharge from the basin at SD001 indicates that mercury concentrations have not exceeded 1 ng/L, below the water quality standard of 1.3 ng/L.

Consequently although the fact that there has been a single ground water data point in SD005 that exceeded the mercury level, subsequent testing at SD005 and SD001 confirm that mercury concentrations leaving the basin are below 1 ng/L. This new information then is a single data point contradicted by other more recent data and does not significantly affect the environmental effects of the project. Therefore this changed circumstance does not form the basis for a supplemental EIS.

Cooling Intake Structure Rule. WaterLegacy, in its comment letter on the proposed Permit Amendment, raised concerns about USEPA's 2016 comments to MPCA on a Pre-Public Notice Draft NPDES permit for Northshore-Silver Bay related to cooling water intake. [See Ref. 33 at 16].

The USEPA, in Comment 1 on the MPCA's *2016 Pre-Notice Draft Permit* for its MPCA NPDES/SDS Permit, raised the need for an "interim BTA [Best Technology Available] determination" regarding the cooling water intake structure rule for existing facilities. [See Ref. 32 at 1]. This comment is related to federal requirements for the cooling water intake associated with the currently idled power plant co-located at the Silver Bay plant site. The items identified in the USEPA comment do not relate to the infrastructure or operation of the Mile Post 7 tailings basin beyond the unrelated aspect that a small amount of make-up water for the taconite plant is also drawn through the intake structure, and some of that water may eventually report to the basin with the tailings slurry. However, this activity alone would not trigger the federal requirements. This does not constitute new information of a change in circumstance within the meaning of Minn. R. 4410.3000, subp. 3A(2).

Restrictions on Flow Rate. WaterLegacy, in its comment letter on the proposed Permit Amendment, raised concerns about USEPA's 2016 comments to MPCA on a Pre-Public Notice Draft NPDES permit for Northshore-Silver Bay related to restricting discharge volume. [See Ref. 33 at 16].

USEPA Comment 10 raised concern about the lack of any "restriction on flow rate for the discharge in the permit," requesting clarification on a number of points relative to compliance with federal regulations. [See Ref. 32 at 2]. MPCA disagreed with USEPA's comment that there was a lack of any restriction on flow rate. The pre-notice permit reviewed by USEPA included language similar to that in the existing permit which reads: *"The Permittee shall discharge through outfalls SD001 plus SD005 no more than the annual net precipitation from the Mile Post 7 tailings basin during each calendar year."* MPCA reports the draft language set forth the formula the Proposer was required to use to calculate the annual net precipitation to assure compliance with federal regulations. This narrative language serves as an annual limit on the volume of discharge and the ability to comply with this provision is not expected to change with implementation of the Proposed Project.

The USEPA also questioned the "historical net precipitation" component in the draft permit. MPCA reports that language is similar to language in the existing permit that reads and, MPCA argues, is a scientifically justifiable method to calculate net precipitation at the Mile Post 7 basin: "*In addition to the annual net precipitation, the Permittee is allowed to discharge through outfall SD001 the volume of net precipitation that has accumulated within the Mile Post 7 Tailings Basin in previous years of basin operation from 1985-2004.*" The draft and existing permits also included the following: "*The discharge of historical net precipitation will be reviewed prior to any subsequent permit reissuance or modification to verify that this practice is still justified for proper facility operation and dam safety. If, at any time, the MPCA determines that this practice is no longer justified for the reasons identified above, this language may again be modified*."

The Proposed Project is not expected to result in an increase in the discharge from the water treatment plant. Based on its review of the historic data, the MPCA concluded that the rate of treated wastewater discharged is

comparable to historic norms. Because there is no new data and there is not a change in circumstance, it is not necessary to determine whether changes in treatment plant discharges may significantly affect the environmental effects of the Project as studied in the 1975-76 EIS.

Chronic Whole Effluent Toxicity. WaterLegacy, in its comment letter on the proposed Permit Amendment, raised concerns about USEPA's 2016 comments to MPCA on a Pre-Public Notice Draft NPDES permit for Northshore-Silver Bay related to chronic whole effluent toxicity. [See Ref. 33 at 16].

USEPA Comment 8 raised concerns regarding the lack of a stated methodology for calculating chronic whole effluent toxicity as part of the draft permit's monitoring requirements. USEPA also noted this was an annual monitoring and reporting event. [See Ref. 32 at 2]. MPCA notes annual toxicity testing, with a TUC effluent limit of 1.02, is required for the water treatment plant's effluent discharge at SD001. The testing results since at least 2010 show that all samples have "passed" (i.e., TUC < 1.0), thus MPCA does not identify any concern over toxicity in the discharge. Because there is no new data and there is not a change in circumstances pertaining to chronic whole effluent toxicity, there is no new information or changed circumstances that would require the preparation of a supplemental EIS.

Other Monitored Parameters. DNR notes the MPCA NPDES/SDS Permit includes provisions for monitoring 19 other parameters outside of turbidity, fibers, fluoride, specific conductance, sulfate, total mercury at SD001. [See Ref. 17 at 17-18]. MPCA reports the one parameter of concern at the Mile Post 7 tailings basin is "sodium, % total cations" related to the effluent monitoring at SD001. Values reported for the water treatment plant's effluent discharge at SD001 are typically in excess of the Class 4A water quality standard of "60% of total cations as milli-equivalents per liter." The current permit requires monitoring only of sodium, % total cations at SD001 and SD005; there are no effluent limits assigned for this parameter in the permit, therefore no violations of effluent limits have occurred for the parameter. A review of monitoring data at SD001 indicates values consistently >60%, while values at SD005 are consistently <60%. This issue will be addressed as part of the next NPDES/SDS Permit reissuance process. This issue is not expected to result in a substantial change in the volume of water treated, the influent quality, or the treatment efficiency of the water treatment plant, and is not considered new information or a change in circumstance that would significantly affect the analysis of environmental effects in the 1975-76 EIS.

Conclusion. After reviewing the extensive documentation regarding water quality in the EIS, and subsequent permitting actions, and the impacts of the Proposed Project, the DNR has determined that there is no new information or changed circumstances concerning water quality not studied in the 1975-76 EIS or subsequent water quality permitting that constitute new information or a change in circumstance that give rise to significant potential environmental effects from the Proposed Project that were not considered in the final EIS or subsequent permitting premised thereon.

4.3.2.7 Ash Landfill

4.3.2.7.1 Ash Landfill Impacts Analyzed in the 1975-76 EIS

The project evaluated in the 1975-76 EIS did not include construction and operation of an industrial solid waste disposal facility at Mile Post 7.

4.3.2.7.2 Changed Circumstances Associated with the Siting of the On-site Ash Disposal Facility that May Significantly Affect the Environmental Effects of the Proposed Project and That Were Not Studied in the EIS.

Historically, Reserve Mining began disposing demolition debris from its Silver Bay and other facilities in unused portions of the Mile Post 7 tailings basin. This disposal was neither anticipated nor analyzed in the 1975-76 EIS. The disposal site(s) were unlined but above the water level in the basin. Originally taking the form of three permit-by-rule (PBR) landfill sites, each disposal site was designed with a capacity of up to 15,000 cubic yards of demolition waste. This disposal method changed in 2000 when the MPCA issued to the Proposer its Solid Waste Permit SW-409 (MPCA Solid Waste Permit) to construct a lined solid waste disposal facility in the west corner of the Mile Post 7 site for disposal of demolition debris and coal ash. [See Ref. 20 at 4]. This permit was reissued in 2004, 2010, and most recently on May 18, 2017. The ash landfill is currently permitted through 2027. Pursuant to the terms of the permit, construction of this facility occurred in four phases commencing in 2000. As designed the ash landfill is 30 acres with a total capacity of 566,000 cubic yards. Construction of Phases I, II, and III have already been completed and filled with waste. A portion of the Phase IV liner was constructed in 2008 (designated as Phase IVA) for the purposes of managing stormwater from Phases I-III. The ash landfill is projected to continue to be used for the disposal of coal ash and other approved wastes up to its ultimate design capacity. [*Id.*].

The proposed Dam 1 extension that is included in the requested Mile Post 7 Permit Amendment is necessitated by the placement of the ash landfill in the far western part corner of the originally planned tailings basin. The purpose of the reconfiguration of Dam 1 is to prevent stored tailings from spilling into the ash landfill on its southeast and northeast sides. Deposition of tailings on the facility would compromise planned future operations of the facility as well as reclamation and closure measures designed to protect the environment. Likewise, the railroad will be relocated to avoid the landfill on its southwest and northwest sides. Both the ash landfill and proposed Dam 1 extension are within the existing Permit to Mine area of disturbance boundary. The existing and proposed site conditions around the landfill are shown below. See ERND Figure 8: Post-EIS Facilities, and ERND Figure 3: Proposed Tailings Progression.

Existing Site Condition **Proposed Site Condition**

Once tailings deposition progresses to Dam 1 in the vicinity of the ash landfill, two issues must be considered: potential seepage at the base of Dam 1; and potentially higher local groundwater elevations. Specifically:

- Seepage. As set forth in the 1975-76 EIS, some degree of seepage was anticipated to occur from Dams 1, 2, and 5. Because Dam 1 is being constructed around the perimeter of the ash landfill (to prevent tailings from spilling into it), it is anticipated that seepage would occur along the portion of the Dam 1 extension in the vicinity of the ash landfill. Because the predominant soils in areas undergoing construction to extend Dam 1 are comprised of low permeability soils, such as lean clay and silty sand till present at existing dam footprint, this future seepage is expected to behave similar to existing conditions. This means seepage from Dam 1 will generally move away from the ash landfill, and be directed to the existing seepage collection and recovery ponds. Given the location of the seepage collection and recovery ponds relative to the ash landfill, no seepage-related impacts to the ash landfill are anticipated.

  The Proposer anticipates that at some point when the tailings pond elevation is higher, the pond on the west side of the western extension of Dam 1, (near "2" shown on the figure below), would become a seepage pond in the future for any new sources of seepage through the dam. This seepage would be managed the same as other seepage collected at the site.

- Localized Groundwater Levels. In 2016, the Proposer analyzed the potential impact of tailings disposal over time on local groundwater levels at the ash landfill facility. This analysis was undertaken because the Proposer had considered raising the ultimate dam height by 50 ft to 3,165 ft amsl, which could affect the local water table under the ash landfill. Importantly this 50-ft increase in dam height is not proposed under the current Permit to Mine Amendment and is no longer under consideration. [See Ref. 2].

  The assessment of potential changes to local groundwater levels is necessary in this instance for the ash landfill's design, construction, and operation because landfills "generally require a vertical separation between the bottom of the landfill liner and local groundwater elevation to prevent upward pressure that

could damage the liner." Modeling based on conditions at Mile Post 7 showed that a future tailings pond at an elevation of 1,355 ft amsl (assuming a 10 ft freeboard at the dam faces) "would not raise the [local groundwater] elevation beneath the landfill." This was because the drainage ditch placed at toe of the future exterior slope of the Dam 1 extension (to collect seepage) is at a base elevation that prevents additional head pressure on groundwater at the water table elevation under the ash landfill. Having this drainage ditch present thus assures the stability of the landfill's liner. [*Id*. at 1-3]. The base elevation for the currently proposed drainage ditch design is consistent with that evaluated in 2016. Extrapolating the results of the previous modeling to the Proposed Project, no impacts to the existing ash landfill as a function of elevated local groundwater levels are anticipated.

Conclusion. The issue of waste disposal was not addressed in the 1975-76 EIS. Subsequent to the EIS, an industrial solid waste landfill was permitted, constructed, and has been operating since 2000, with the facility currently permitted through 2027. Given the location of the ash landfill on the site, both the Dam 1 extension and relocation of the West Ridge Railroad must be designed to go "around" the landfill in ways that avoid impacts to this site infrastructure. In addition, any impacts that might result from tailings continuing to progress westward, upgradient to ten feet less than the ultimate dam height of 1,315 ft amsl, must be considered.

The proposed corridors of disturbance for the dam extension and relocated railroad are designed to avoid impacts to the ash landfill and vice versa; no impacts outside those of the types considered in the final EIS are expected. Similarly, adverse seepage-related impacts and groundwater/local water table impacts on the ash landfill are not anticipated from the continued progression of the tailings as considered in the final EIS. The extension of Dams 1 and 2, retiring/relocating the West Ridge Railroad, and continuing deposition of tailings into the basin, would not result in new significant impacts from the current conditions, the latter which does not substantially differ from the EIS analysis.

4.3.2.8 Project Lifespan

4.3.2.8.1 Project Lifespan Impacts Analyzed in the 1975-76 EIS

The 1975-76 EIS assessed a facility where the design met the need for the basin to hold 40 years of "Reserve's proposed operation" and resulting fine tailings. [See Ref. 8 at 35, 61, 81, 87]. This had the tailings basin life set at 40 years because that was "the expected lifetime of the plant." [*Id.* at 274]. Tailings deposition would cease once the plant stopped operations, with reclamation and closure to follow. [*Id.*]. Although Reserve Mining proposed a 40-year term of mining for the Peter Mitchell Mine in assessing Mile Post 7, the EIS noted the ore body "being mined is sufficient for 50 to 60 years of open pit mining." [See Ref, 9; Admin. Hearing ¶¶ 7 and 8]. It was noted, however, that more ore reserves could become available in the future. In fact, there was "no evidence that Reserve plans to terminate operations at the end of its current 40 year mining plan." [*Id.*].

4.3.2.8.2 New Information or Changed Circumstances Associated with the Project Lifespan that May Significantly Affect the Environmental Effects of the Proposed Project and That Were Not Studied in the EIS.

Mining at the Peter Mitchell Pit is expected (and permitted) to occur for decades beyond 2025. Because actual tailings production has been lower than anticipated, it has taken longer for the basin to reach the originally

planned capacity. Assuming mining and processing rates from the last 20 years stays relatively constant, the tailings basin at the ultimate dam height of 1,315 ft amsl appears to have enough remaining storage capacity to contain multiple decades of future tailings production from the Proposer's operations.

In terms of the Permit Amendment, the Proposed Project provides the remaining infrastructure necessary for the facility to reach its planned storage capacity, which was originally set in the 1975-76 EIS and initial permitting. Recognizing the Peter Mitchell Mine and Silver Bay facility are already permitted to operate beyond 2025, and future operations are of the same nature as operations conducted to date, the potential for significant adverse environmental effects is not substantially different if the facility operates beyond the originally anticipated 40 years. DNR acknowledges that if additional tailings storage capacity were needed beyond that already permitted in order to continue mining, then a new tailings basin would be required or the present tailings basin would need to be expanded. This would require environmental review.

Conclusion. Using the entire capacity of the basin was anticipated in the original EIS. The fact that it has taken longer to fill the basin does not significantly affect the environmental effects of the Project studied in the 1975-76 EIS. Thus the DNR concluded that the extension of the temporal life of the Mile Post 7 tailings basin does not require a supplemental EIS.

4.3.3 Analysis of the Availability of New Information or Circumstances that Significantly Affect the Availability of Prudent and Feasible Alternatives.

Minnesota Rule 4410.3000, subp. 3A(2) requires an RGU to supplement an EIS when there is "substantial new information or new circumstances . . . that significantly affect the availability of prudent and feasible alternatives with lesser environmental effects." The Mile Post 7 tailings basin project has been in operation for over 40 years and has multiple decades of useful life remaining to reach full capacity as evaluated in the 1975-76 EIS. The present proposed Permit Amendment does not enlarge the tailings basin nor its useful life. The proposed Permit Amendment is to relocate the rail line that currently traverses the basin to the western edge of the basin so that the remaining unfilled portions of the basin may be filled. Additionally, the proposed Permit Amendment would extend Dam 1 to close the western wall of the tailings basin, principally to prevent tails from spilling into the adjacent ash landfill located in the south west corner of the Mile Post 7 project footprint. Dam 2 needs to be extended to manage tailings on the eastern side of the basin. As required by Minn. R. 4410.3000, subp. 3(A), the DNR has conducted an analysis to determine whether there is new information or circumstances that significantly affect the availability of prudent and feasible alternatives.

4.3.3.1 1975-76 EIS Alternatives Analysis

The 1975-76 EIS identified four "classifications" of alternatives to Reserve Mining's proposed Mile Post 7 tailings basin project:

1. Continuation of tailings discharge into Lake Superior.
2. Development of by-product uses and markets for taconite tailings.
3. Termination of Reserve Mining Company operations, (essentially a no build alternative because it would eliminate the need for a tailings basin).
4. Deposition of tailings at some on-land site other than Mile Post 7.

The EIS provided the following rationales for dismissing the first three classes of alternatives:

Continuation of Tailings Discharge to Lake Superior. Essentially maintenance of the status quo, this alternative had been previously rejected by the State of Minnesota, the Federal Government, and the courts. This justified no further investigation of this alternative.

Development of By-Product Uses and Markets for Taconite Tailings. Possible uses considered included: crushed rock for construction, aggregate for concrete and/or asphalt paving, landfill, railroad ballast, and other applications; as a sand substitute; fabricated bricks and blocks; and aggregate material for bituminous paving. In general transportation costs was the primary factor limiting feasibility. The presence of asbestiform fibers, and uncertainties around economic investments, would likely have concerns. This justified no further investigation of this alternative.

Termination of Reserve Mining Company Operations. Given the significant economic elements of Reserve Mining's operations, the EIS authors believed any decision to terminate operations should be left to the company as it would likely result from no means being available to mitigate the significant health impacts. Investigating this scenario in an EIS was not reasonable. This justified no further investigation of this alternative.

Deposition of Tailings at Some On-Land Site Other than Mile Post 7. EIS evaluation of alternative sites other than Mile Post 7 was considered reasonable. Alternative sites were investigated in the EIS.

Because alternatives 1, 2, and 3 were found not to be either feasible or prudent, the 1975-76 EIS identified a number of alternative sites, including the Mile Post 7 site, to analyze in the EIS. As the proposed project for analysis in the EIS, Mile Post 7 was treated as the "build alternative." [See Ref. 8 at 57-58]. Sixteen (16) disposal plans/sites were considered in the 1975 scoping process. These proposed alternative locations were developed between 1969 and 1975 and came from a number of sources, including commenters. Ultimately, the list of alternative sites that would be evaluated in the EIS was screened down to the following locations:

- Mile Post 7 – approximately 35 miles southeast of the Peter Mitchell Mine pit.
- Embarrass Site – approximately one mile northwest of the Peter Mitchell Mine.
- Colvin Site – approximately four miles southeast of the Peter Mitchell Mine pit and along the Reserve railroad.
- Snowshoe Site – approximately seven mile southeast of the Peter Mitchell Mine pit and along the Reserve railroad.
- Midway Site – approximately 15 miles west-northwest of the Silver Bay plant and along the Reserve railroad.
- Mine Site – in the Peter Mitchell Mine pit. [*Id.* at 58-63].

Part IV of the 1975-76 EIS evaluated the impacts of implementing all six of the proposed alternative sites. This was done by analyzing each site using 15 topic areas. The results of this analysis was summarized in Table C of the 1975-76 Executive Summary. [*Id.* at 219-274 and xv-xvi].

Testimony and written documentation regarding these alternatives were received during the EIS Administrative Hearing. The testimony and written documentation submitted in this hearing addressed in-pit disposal, modifications to operations at alternative sites, a comparison of environmental effects of the alternatives, a

comparison of the economic effects of the alternatives, and the economic feasibility of the alternatives. [See Ref. 9; Admin. FOF at ¶¶ 80 through 125].

4.3.3.2 Selected and Permitted Alternative

Reserve Mining selected the Mile Post 7 site as the preferred project site, and in 1977 the DNR issued Reserve Mining a Master Permit for the Mile Post 7 Project; MPCA issued its permits in 1978. Construction commenced shortly thereafter. The first tails were placed in the basin in 1977-78. At the time of permitting, assuming certain levels of tailings production, it was anticipated that the useful life of the Mile Post 7 tailings basin would be 40 years. The Mile Post 7 tailings basin has not been filled at the rate originally anticipated. As set forth in Part 3.1.4.2 of this Determination, the Proposer has only used 191,118,000 long tons of the total 753,023,000 long tons of total tailings entrainment capacity within the basin. There is still 561,905,000 long tons of tailings storage in remaining capacity. Current data indicates that this remaining capacity is sufficient to store multiple decades of the tailings produced from processing the remaining available ore extracted from the Peter Mitchell Pit.

4.3.3.3 Feasible and Prudent Alternatives

To determine whether there is new information or circumstances available that would affect potential feasible and prudent alternatives for the Mile Post 7 tailings basin, it is necessary to first assess whether there are alternatives to using the remaining capacity of the tailings basin by extending Dams 1 and 2 and relocating the rail line currently traversing the pit. The DNR identified the following alternatives to the proposed modifications to the Project advanced in the proposed Permit to Mine Amendment:

- Close the Mile Post 7 Tailings Facility.
- Do nothing or null alternative.
- Redesign the dams.
- Open a new tailings basin.
- Extend the Dams 1 and 2 and relocate the rail line.

In addition to these alternatives, commenter WaterLegacy has proposed the following alternatives:

- Line the tailings basin.
- Dry stack the tailings.
- Use a new dust suppressant.

The DNR notes that lining the existing Mile Post 7 tailings basin would require the removal of existing tailings, lining the basin, and then replacing the tailings. This activity would require securing an adjacent site for storage of the tailings while the basin is lined, likely resulting in significantly new environmental impacts at the temporary storage site. For this reason DNR determined that lining the existing basin was not a feasible and prudent alternative, and that the lining proposal advanced by WaterLegacy was more appropriately considered in the alternative designated as opening a new tailings basin.

Likewise, transitioning the current tailings basin into a dry stack facility is not feasible. Rather than managing tailings as a slurry (60% solids by weight for current operations at Silver Bay), the bulk water content is reduced in dry stack management to typically 85-90% solids by weight. Because of the higher solids content, potential

benefits could include improved stability, water recycling, and reduced footprint (relative to tailings basins). The DNR agrees that both slurry-based and dry stack tailings facilities have both environmental benefits as well as risks. The Mile Post 7 tailings basin, however, was designed, constructed, and operated as a tailings slurry facility. General considerations around implementation of a dry stack facility at Mile Post 7 include but are not limited to: site topography; fibers; geotechnical factors; tailings gradation (fines content); and Minnesota climate (i.e., continental temperatures; precipitation). As noted, more specific to the Proposer's operational needs is the presence of amphibole fibers in the tailings, where slurry-based tailings management with continuous inundation (to limit offsite particulate matter transport) is a significant mitigation measure identified in the Administrative Hearing and incorporated into the 1977 Master Permit. The combination of general considerations, plus the presence of fibers, makes the feasibility of any type of dry stack management questionable for Mile Post 7. For the reasons outlined in Part 4.3.3.3 of this Determination, WaterLegacy has argued that tails should be dry stacked and not be further managed as a slurry-based system, but does not address how fibers would be controlled as effectively than under the current management scheme. Therefore, the dry stack alternative is discussed below in Part B.

A. *Closing Mile Post 7 Without a New Tailings Basin and the Null Alternatives are Neither Feasible nor Prudent Alternatives.* The DNR concluded that closing the Mile Post 7 basin without locating an alternative tailings storage facility was neither feasible nor prudent because that alternative would require closing the Peter Mitchell Mine and the Silver Bay processing plant. The Proposer holds a Permit to Mine to mine the remaining ore in the Peter Mitchell Mine and has a property interest in that permit. Closing the Mile Post 7 basin would essentially void the Permit to Mine at the Peter Mitchell Pit without providing the Proposer with the appropriate due process.

   The null alternative would also mean that there would be no location in which to store the tails produced from processing the ore from the Peter Mitchell Mine. This is because without relocating the material supply rail line and extending Dams 1 and 2, dam building for Dams 1, 2, and 5 would be curtailed and the ash landfill could be adversely impacted. Importantly tailings would not be able to reach the permitted basin elevation of 1,305 ft amsl. It would be a practical revocation of the Permit to Mine for the Peter Mitchell Mine because ore from that mine cannot be processed if the remaining capacity of the Mile Post 7 cannot be used for the storage of tails. If the Peter Mitchell Mine is to continue to operate as previously permitted, then there must be a place in which to store the tails. Therefore, closing Mile Post 7 without an alternate location for tailings disposal is neither feasible nor prudent. Nor is it prudent to close the facility when the basin still has the capacity to store the additional 561,905,000 long tons of remaining tailings anticipated in the 1975-76 EIS.

B. *Constructing a New Dry Stack Storage for Tails and/or a Lined Tailings Basin is not Prudent.* WaterLegacy, in its September 21, 2020 Comment Letter (See Ref. 33), has identified "new information or circumstances" related to the sulfur content of waste rock from the Peter Mitchell mine. Specifically it expresses concern that as mining operations in the Peter Mitchell Pit continues, they will progress "into Virginia Formation[4] rock . . .

[4] Virginia Formation Rock (e.g., Type II VF rock) is a metamorphic rock formation at the Peter Mitchell Mine with a whole rock sulfur content of greater than or equal to 0.2 weight percent and less than 1.0 weight percent sulfur, or with a neutralization potential ratio of less than 3.

[resulting in] releases from the higher sulfur tailings" that would eventually find their way post-processing into the Mile Post 7 basin. [See Ref. 33 at 18, 21]. The Commenter's further opine that tailings from ore mined as the Proposer moves into the Virginia Formation will discharge sulfate contaminated water into Beaver River once these tails are placed in Mile Post 7 site. [*Id.*]. WaterLegacy, therefore proposes that DNR should consider a new lined tailings basin, or a new dry stack tails storage facility, as a feasible and prudent alternative that should be employed to prevent sulfate contamination. [See Ref. 33 at 21].

At the outset DNR notes that the term feasible means "reasonably capable of being completed or accomplished." *The Law.Com Law Dictionary & Blacks Law Dictionary,* available at Definition of FEASIBLE • Law Dictionary • TheLaw.com. The DNR agrees that it may be theoretically feasible to locate, permit, and construct a new tailings basin over the course of a several year process, thus the central question at issue in this analysis is whether it is prudent to do so. The term prudent is generally understood to mean whether a course of action is "of reasonable and good judgement." *The Law.Com Law Dictionary & Blacks Law Dictionary,* available at Definition of PRUDENT • Law Dictionary • TheLaw.com. Thus, the DNR must analyze whether, based on any new information or circumstances before it, it is prudent or reasonable to advocate for a new tailings basin to open a new tailings storage site so that the basin can be lined, or the dry stack method of storing tailings may be employed while there is remaining useful life in the Mile Post 7 basin.

The 2015 Environmental Assessment Worksheet for the Northshore[5] Mining Company Progression of the Ultimate Pit Limit Project (2015 EAW) for the Peter Mitchell Pit mine evaluated how Virginia Formation rock extracted from the Peter Mitchell Pit would be handled. Virginia Formation rock (Type II VF rock) has no recoverable iron content. The rock is handled pursuant to the current Permit to Mine for mining operations at the Peter Mitchell Pit. Because Type II VF rock does not contain recoverable iron ore, it is not sent to the Silver Bay plant for processing but is managed at the pit in accordance with the terms of the pit's Permit to Mine. [See Ref. 12]. The only tailings stored in Mile Post 7 are tailings from the Silver Bay processing plant, thus no tailings are expected to contain sulfide from Type II VF rock. With that said, DNR noted in the April 2015 Record of Decision (2015 ROD) prepared for the 2015 EAW, it remains possible that a "very small amount" of Type II VF rock could be processed unintentionally. There is no new information or circumstance that would modify the conclusions reached in either the 2015 ROD, or the 2015 EAW. [See Ref. 13 at 19].

Water discharges at the Mile Post 7 tailings basin are governed by the 1985 NPDES/SDS Permit. As a part of managing the permit, the MPCA has required ongoing monitoring of water discharges from the Mile Post 7 tailings basin. The data from this monitoring support the conclusion that sulfate impacts to surface water discharged from the Mile Post 7 tailings basin remain under regulatory sulfate limits even as the Proposer has mined into that portion of the Peter Mitchel Pit requiring special management of the Type II VF Rock. MPCA reports that since 2015, sulfate concentrations in the main discharge from the tailings basin have generally

[5] The reference here to Northshore Mining Company is for convenience only and should not be construed as an admission by the DNR that the Northshore Mine and Mile Post 7 are not a Cleveland Cliff's Operation. Northshore Mining Company is wholly owned by Cleveland Cliffs, and consistent with DNR practice, both Cleveland Cliff's and Northshore Mine are considered owners and operators of the Mile Post 7 Tailings Basin and all other Northshore mining operations.

ranged from approximately 55 to 75 mg/L.[6] The smaller discharge from SD005 ranges in concentration from about 4 to 6 mg/L sulfate. Concentrations of sulfate in downgradient groundwater monitoring wells are typically below 25 mg/L, and below 5 mg/L in monitored surface water. For each of these monitoring locations, this range of values are well below the 250 mg/L standard set for Class 1B waters. Given that the Proposer has already mined into the Virginia Formation, and that there has been no appreciable increase in sulfate levels in water discharge, the DNR concludes that there is no new significant information regarding water quality that would cause the DNR to advance an alternative calling for the construction of a new tailings basin.

Additionally and as previously discussed in Parts 4.3.2.3.2 and 4.3.2.6.2 in this Determination, the available data, including ongoing site monitoring, indicates that the Mile Post 7 tailings basin has been and continues to meet available water quality standards as set forth in its current NPDES/SDS Permit.

Because the "new information and circumstances" presented in WaterLegacy's comments together with current and available data, including the operational plan for the Peter Mitchell Mine, and available water quality monitoring results, demonstrate that the Mile Post 7 tailings basin continues to meet water quality standards, this information cannot be considered significant new information. Nor does this information weigh in favor of developing an alternative tailings basin site, simply so that site can be lined. Opening a new tailings basin with its associated environmental impacts when there is no significant new information or circumstances that would weigh in favor of that alternative is simply not prudent. Nor will opening a new tailings basin negate the need to continue ongoing monitoring and maintenance of the Mile Post 7 site. Rather, opening a new tailings basin will require the denigration of potentially hundreds of new acres with the associated natural resource damages at a new, as yet undisturbed site, to construct a new tailings basin for storing the remaining tailings generated from processing taconite ore from the Peter Mitchell Mine. The environmental impacts of opening a new tailings basin is an order of magnitude greater than the impacts on the additional estimated 30 acres of land (subject to the Permit Amendment) at Mile Post 7 needed for the extension of Dams 2. Additionally, if a new basin is opened, instead of reclaiming, closing, and monitoring a single site, two sites will have to be reclaimed, closed, and monitored. In short, a new tailings basin simply spreads the environmental risk to another, as yet undetermined site, for little environmental benefit.

WaterLegacy also speculates that a lined, filtered tailings facility "would also prevent adverse impacts to water quality from increased hydraulic head and seepage to and through groundwater" associated with using all of the available capacity in the Mile Post 7 tailings basin. [See Ref. 33 at 21]. However, analysis of data available from ongoing monitoring at Mile Post 7 site indicates that the proposed use of the site's remaining capacity will not result in an increase in hydraulic head. This is because no change is being proposed to the ultimate dam height of 1,315 ft amsl, and the design of the toe of the dam includes measures to maintain the local water table. There is no new information that suggests otherwise. The Proposer reports that at some point when the tailings pond elevation is higher (over the course of permitted future operations), the pond on the west side of the western extension of Dam 1 would be converted to a seepage pond for any new sources of

[6] The MPCA classifies wild rice waters as Class 4A and applies the more stringent sulfate standard of 10 mg/L to wild rice waters. Beaver Creek is not a wild rice water and, therefore, those lower standards do not apply.

seepage through the dam. Absent this predictable future impact, there is no new information to suggest any increase in hydraulic head and seepage beyond that already anticipated.

WaterLegacy has stated that dry stacking is also a design alternative that could reduce the risk of environmental contamination associated with storing mine wastes containing sulfide waste. As noted above, it is unlikely this technology could be employed at Mile Post 7 and thus would require opening a new tailings basin. However, there is no new information to support a conclusion that extending Dams 1 and 2, and relocating the current rail line to allow use the remaining useful life of the tailings basin, will result in an increase of sulfate at or above the water quality standards for receiving surface water or groundwater resources. Thus, as articulated above, it is more prudent to permit the remaining capacity of Mile Post 7 to be used, rather than opening a new tailings basin thereby creating environmental degradation in another location.

Finally, WaterLegacy argues that creating a new lined, filtered tailings facility would reduce the risk of dam failure, permitting "earlier closure, drainage, reclamation, and revegetation of the current sensitive wet tailings storage site, which is perched above Lake Superior and the community of Silver Bay." [*Id*. at 21]. The dams at the Mile Post 7 tailings basin meet or exceed all applicable Factors of Safety for dam construction and are subject to regular engineering inspection and assessment to ensure dam safety. The potential for early closure of the Mile Post 7 tailings basin has always existed. While DNR acknowledges termination of tailings deposition into Mile Post 7, or any tailings basin, represents an important project milestone, subsequently initiating reclamation activity followed by closure, closure of the Mile Post 7 tailings facility will not result in the termination of all potential environmental risk. In fact, closure of Mile Post 7 and construction of a new tailings disposal facility actually multiplies environmental risks. In such a scenario, not only would any risks associated with Mile Post 7 continue to exist, but creating a new tailings basin will simply shift the environmental degradation associated with tailings storage to a new location spreading the potential adverse environmental impacts associated with storing these tailings across two locations. This would be the case no matter the reason for the cessation of activity.

For these reasons, the DNR has determined that the new circumstances and information identified by DNR or provided by WaterLegacy are not significant and that opening a new tailings basin and spreading the potential environmental risk over two locations is not prudent.

C. *There is No New Information or Circumstances that Support a Conclusion That Redesigning the Mile Post 7 Dams are Either Feasible or Prudent.* Over the past several years there have been a number of notable tailings basin dam failures, with WaterLegacy identifying failures at the Mount Polley Dam (British Columbia, Canada), Fundao Dam (Samarco, Brazil), and Corrego do Feijao Dam (Brumadinho, Brazil). [*Id*. at 11, 21]. The DNR has carefully examined the technical reports for these types of dam failures in the context of all tailings basin dams in Minnesota. There are notable differences between these facilities and Mile Post 7. Focusing on the Proposed Project at Mile Post 7, these are not likely to result in any substantial change around the Factors of Safety associated with Dams 1, 2, or 5, which are the facility features classified as a Class 1 Hazard dams regarding the potential for loss of life and/or property from a catastrophic failure.

Citing these other dam failures, WaterLegacy asserts that there is a risk of catastrophic dam failure at the Mile Post 7 tailings basin. They assert that this risk is associated with: 1) the presence of clays as a dam construction material; 2) the use of the upstream dam construction method since 1997; and 3) the large

water impoundment on top of the tailings basin. They assert that a dam failure at Mile Post 7 would "release massive quantities of tailings and untreated wastewater to Lake Superior and threaten the safety of workers and community residents." [*Id*. at 12-14, 21].

Regarding WaterLegacy's assertions regarding lacustrine clays present at the site of Dam 1, the issue received significant attention during 1975-76 EIS. [See Ref. 8 at 35, 44, 120, 125, 134; see Ref. 9; Admin. FOF ¶¶ 20-25]. Similarly, according to the 1985 Permit to Mine, the known presence of the clays "had a considerable influence on the designs of the dams at this site." [See Ref. 11 at 6]. Subsequent evaluations reviewed by DNR appear in line with the assessment of the clay foundation detailed in the EIS. If the clay met the appropriate design specifications, then there is no need for further testing. The clay was monitored with settlement plates early on and is retested regularly. Review of the supporting documents does not support the assertion the presence of these lacustrine clay materials makes this dam unsafe.

WaterLegacy asserts that the recent dam failures are significant new information because they support the conclusion that upstream dam construction is inherently unsafe. DNR has evaluated this assertion by WaterLegacy in other decisions regarding different facilities, but DNR does not have to reach that issue here because the safety of upstream dam construction is not at issue. The use of upstream dam construction was rejected at the outset in favor of downstream dam construction (for Dam 1) and centerline construction (for Dam 2). In 2003, construction shifted to a modified centerline (or offset upstream) method of construction for both dams, which has been employed since. [See Ref. 26 at 4, 8]. Although upstream construction was considered in 1996, and attempted at Dam 5 for a few years, these efforts were discontinued in 2003. [See Ref. 23 at 3]. More relevant, the current Permit Amendment with the proposed dam extensions will continue to use the modified centerline construction method. Thus the new information regarding whether the upstream dam construction method is safe is simply not an issue at Mile Post 7.

Regarding the presence of impounded waters as part of facility operation, this feature was specifically added to the design during the EIS to mitigate potential releases of fibers-laden fugitive dust. [See Ref. 9; Admin. FOF ¶¶ 44-47]. Similarly, the 1977 Master Permit requires "the fine tailings in the basin shall at all times be covered by water to the maximum extent possible" unless otherwise covered by materials approved by the DNR Commissioner. [See Ref. 10 at 21]. Given the prominence of managing potential fugitive dust emissions to minimize fibers release, maintenance of some degree of water cover or pool on the site to cover the tailings has been a known design feature for the facility. Assertions that the presence of such a feature in itself constitutes new information compromising the safety of the facility is not supported.

The 1975-76 EIS identified the necessity for strong oversight of the proposed construction and operation of the main dams, which was further reinforced in the dam safety concerns identified in the Administrative Finding of Fact. [See Ref. 9; Admin. FOF ¶¶ at 26-30]. In light of EIS findings and tailings dam failures in other countries such as Canada and Brazil, the DNR has evaluated Factors of Safety of the Mile Post 7 dams based on the latest science. The Proposer is required to assess the relevant Factors of Safety and report them to DNR; see Part 4.3.2.2.2 of this Determination for more information. The Factors of Safety consistently assessed at the Mile Post 7 dams various scenarios for Effective Stress Stability Analysis (ESSA) and Undrained Strength Stability Analysis (USSA); these scenarios include various iterations around block failure, fine tailings yield strength, and liquefied strength. See ERND Attachment 8 for the most recent calculated Factors of Safety for Dams 1, 2, and 5.

DNR's analysis of the proposed dam extensions indicates that the extensions are not likely to result in any substantial change to the Factors of Safety associated with Dams 1, 2, or 5, all of which are Class 1 dams. In addition, the 1975-76 EIS identified the necessity for strong oversight of the proposed construction and operation of the main dams. This oversight was incorporated into the permits. Available reporting under the series of Five Year Operation Plans indicates the existing dams at Mile Post 7 are exceeding minimum Factors of Safety, and there is no reason to expect the proposed extensions of Dams 1 and 2 would compromise that situation.

Contrary to WaterLegacy's assertions, there is no significant change in construction techniques, no new information, and new change in circumstances that would support the conclusion that the dams at Mile Post 7 are unsafe, or the Proposer is using a construction method that is inherently dangerous, and that allowing the construction of the dam extensions to proceed using the modified centerline construction in not prudent.

D. *There is No New Information or Changed Circumstances that Regarding the Application of Coherex Dust Suppressant that Would Impact a Potential Feasible and Prudent Alternative to Use of Said Chemical to Suppress Dust.* WaterLegacy asserts that the application of the Coherex dust-suppressant has the potential to raise mercury levels at WS006. No data was provided to substantiate this claim. [See Ref. 33 at 16, 18]. Mercury water quality limits for the Lake Superior basin, including Beaver Creek, are 1.3 ng/L. Mercury discharges from the tailings basin are subject to regulation by MPCA through the Mile Post 7 NPDES/SDS Permit. The NPDES/SDS Permit requires an annual sample of the dust suppressant Coherex, as applied at the facility. Results of the sampling over the past 10 years indicate that mercury levels have been below the sample reporting limit. Nonetheless, to minimize the potential risk of adverse effects to surface waters associated with the application of Coherex, the permit's conditions prohibits the application of Coherex within 100 feet of surface waters, and requires that it be applied in a manner that does not result in surface runoff. The permit also includes an annual limit to the volume of Coherex that may be applied at the Mile Post 7 tailings basin site. The Proposed Project will not result in a substantial change in the quantity of or application method for Coherex.

   The NPDES/SDS Permit also requires regular monitoring of water discharges from the Mile Post 7 sites. As noted above, the sampling data collected over the last 10 years indicate that mercury levels have been below the reporting limit. Samples taken since 2015 document this fact. This data indicates that the highest mercury value in the discharge from the water treatment plant effluent has been 0.8 ng/L, well below the water quality standard of 1.3 ng/L for the Lake Superior basin. Because there has not been a significant change in the mercury levels discharged from the site, and because those levels are well within regulated parameters, one cannot reach the conclusion that this data changes or alters feasible and prudent alternatives – here the extension of Dams 1 and 2 to allow the Proposer to use the remaining useful life of the tailings basin.

Conclusion: As set forth in this Part the DNR has not identified any new information or circumstances that would necessitate identification and consideration of prudent and feasible alternatives with lesser environmental effects to the Proposed Project. This is because the potential impacts of the Proposed Project do not rise to any level of significance beyond that evaluated in the 1975-76 EIS and permitted by the state through the 1977 Master Permit, the 1985 Permit to Mine, and the 1985 NPDES/SDS Permit (among other approvals, and subsequent amendments, renewals, and re-issuances). If implemented, the environmental effects of the Proposed Project *per se* are minor and likely would be indistinguishable from the existing impacts of historic and current operations.

WaterLegacy's principal recommendation is for DNR to evaluate a "lined, filtered tailings storage facility" in lieu of the Proposed Project based on a number of articulated concerns. The points raised by WaterLegacy do not warrant new information or new circumstances justifying consideration of a completely new tailings disposal technology different from the Proposed Project. DNR does not identify any new information or circumstances significantly affecting the availability of prudent and feasible alternatives with lesser environmental effects.

Determination

DNR acting as Responsible Governmental Unit for metallic mineral mining projects has analyzed the proposed Permit to Mine Amendment and Proposed Project, the latter of which includes the proposed: 1) extensions of Dams 1 and 2; 2) relocation of the material supply rail line; 3) continued placement of fine tailings into the Mile Post 7 basin; and 4) development of a new borrow site to supply clay suitable for dam construction, in accordance with the applicable requirements Minn. R. Ch. 4410.

The DNR finds that pursuant to Minn. R. 4410.3000, subp. 3B, the regulation of the Mile Post 7 tailings facility is an ongoing governmental action and that an EIS was completed for the facility in 1976.

The DNR finds that pursuant to Minn. R. 4410.4400, subp. 8B, the Proposed Project is not construction of a new facility for mining metallic minerals or for the disposal of tailings from a metallic mineral mine.

The DNR finds that pursuant to Minn. R. 4410.4300, subp. 11B, the Proposed Project is not an expansion of a stockpile, tailings basin, or mine by 320 or more acres, and, therefore, an EAW is not required for this proposed modification to the Mile Post 7 Project.

The DNR finds that pursuant to Minn. R. 4410.3000, subp. 3C, the Proposed Project is not a phased or connected action pursuant to Minn. R. 4410.0200, subps. 60 and 9C, because the total capacity of the Mile Post 7 Project was previously studied in the 1975-76 EIS.

The DNR finds that pursuant to Minn. R. 4410.3000, subpart 3A (1)(2), and after DNR consideration of the available information regarding the environmental effects reasonably associated with the Proposed Permit Amendment and Proposed Project therein, and ongoing permitted operations at Mile Post 7, that:

- The new actions proposed by the Mile Post 7 modifications do not result in substantial changes that affect the potential significant environmental effects of the Mile Post 7 Project.
- DNR has not identified substantial new information or new circumstances that significantly affect the potential environmental effects from the Mile Post 7 Project.
- DNR has not identified substantial new information or new circumstances that significantly affect the availability of prudent and feasible alternatives with lesser environmental effects.

Therefore, the preparation of a Supplemental EIS for the Mile Post 7 facility is not required.

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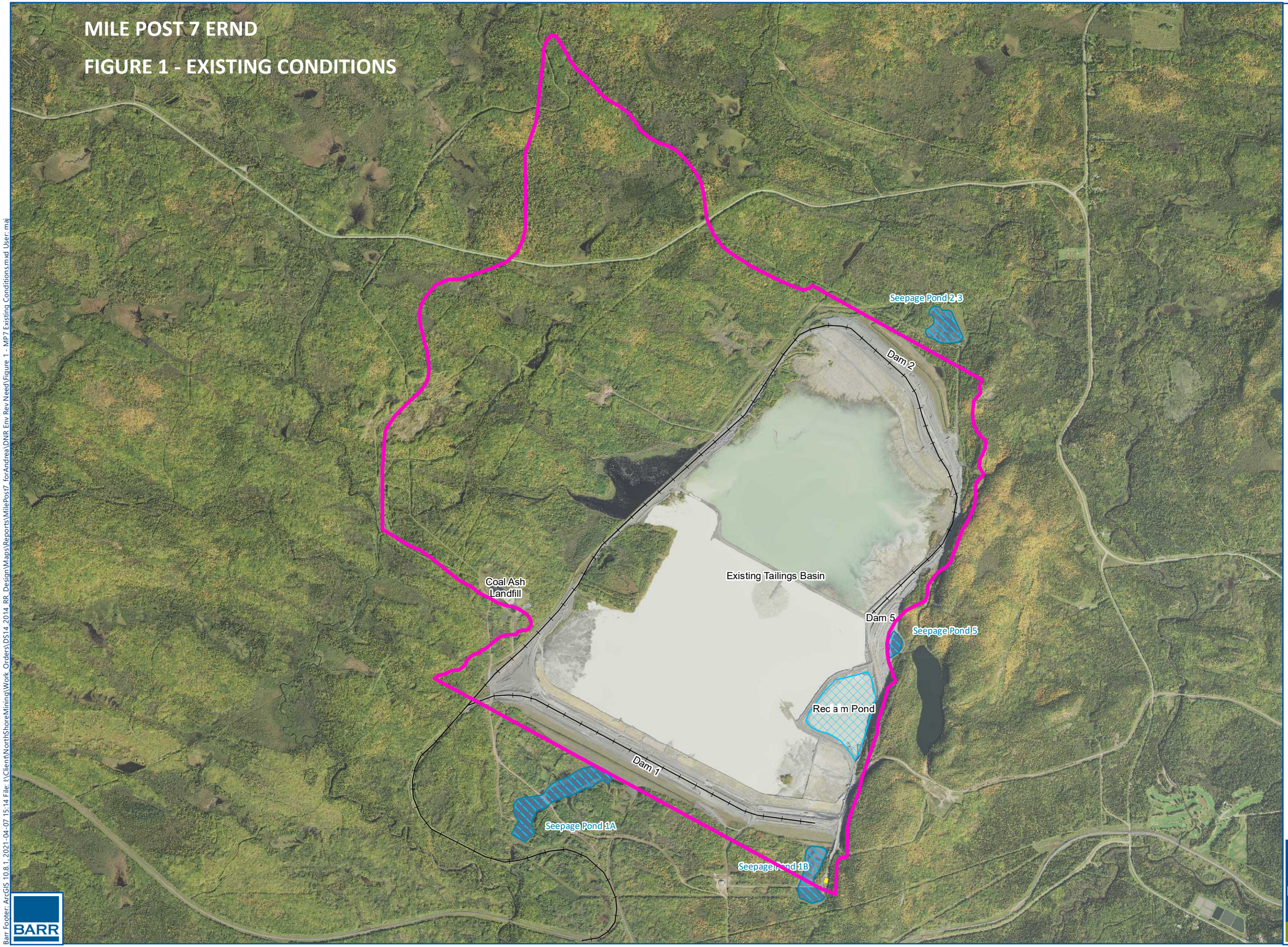
MILE POST 7 ERND

FIGURE 1 - EXISTING CONDITIONS



1975-76 Approved EIS Boundary

Existing Railroads

Water Treatment Plant

Reclaim Pond

Seepage Pond

F

0 2,500

Feet

Imagery: 2019 FSA via MnGeo

TAILINGS BASIN
EXISTING CONDITIONS
Northshore Mining Company
Lake County, Minnesota

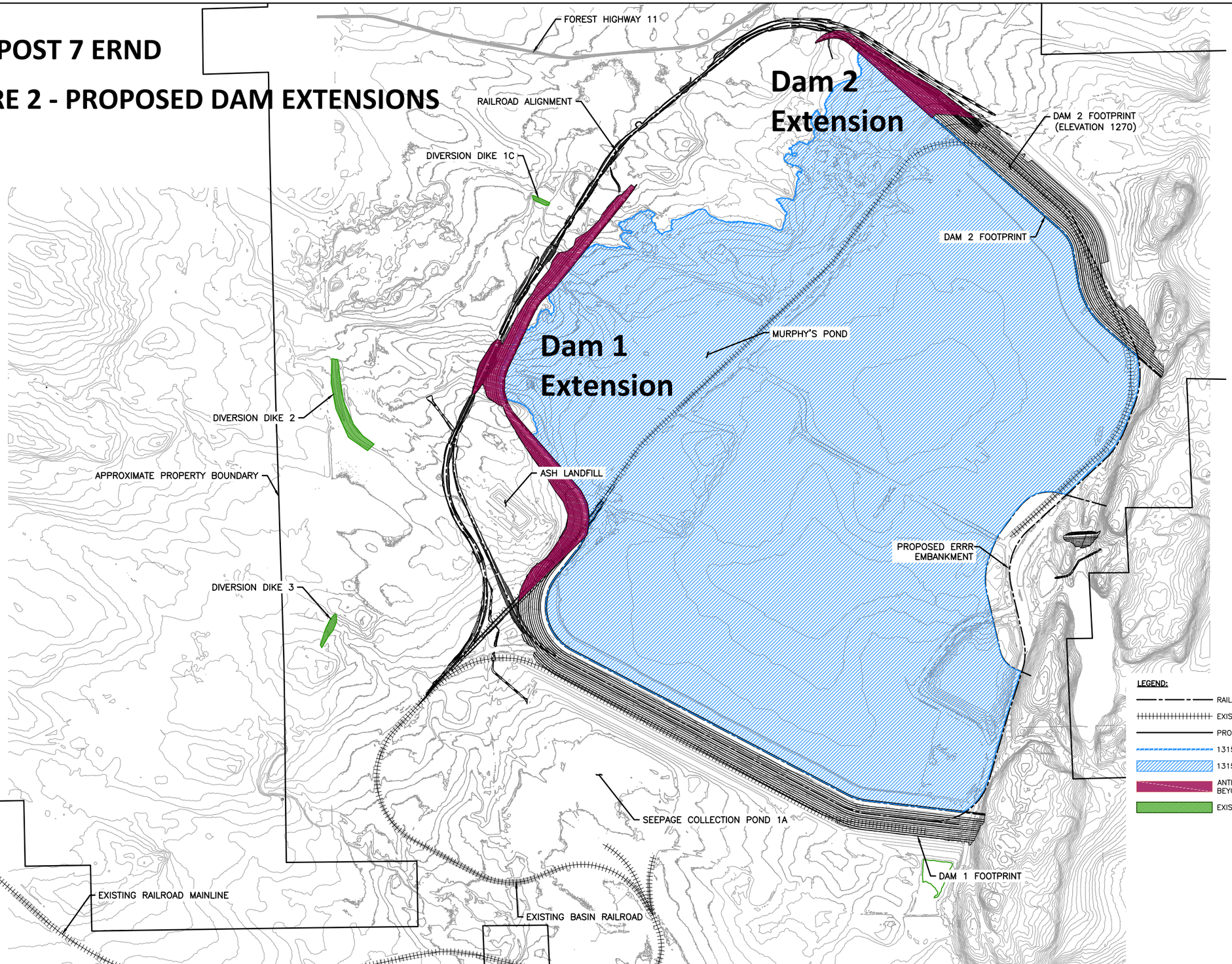
Figure 1

BARR

Barr Footer: ArcGIS 10.8.1, 2021-04-07 15:14 File: I:\Client\NorthShoreMining\Work_Orders\DS14_2014_RR_Design\Maps\Reports\MilePost7_forAndrea\DNR Env Rev Need\Figure 1 - MP7 Existing Conditions.mxd User: maj

MILE POST 7 ERND

FIGURE 2 - PROPOSED DAM EXTENSIONS



NO.	BY	CHK.	APP.	DATE	REVISION DESCRIPTION

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

SIGNATURE _____

PRINTED NAME _____

DATE _____ REG. NO. _____

RELEASED TO/FOR	A	B	C	0	1	2	3
CLIENT							
BID							
CONSTRUCTION							
DATE RELEASED							

BARR
Corporate Headquarters:
Minneapolis, Minnesota
Ph: 1-800-632-2277

Project Office:
BARR ENGINEERING CO.
3128 14TH AVENUE EAST
HIBBING, MN 55746
Ph: 1-800-225-1966
Fax: (218) 262-3460
www.barr.com

Scale	AS SHOWN
Date	3/8/2015
Drawn	GSJ
Checked	LCH2
Designed	GSJ
Approved	

NORTHSHORE MINING COMPANY
SILVER BAY, MINNESOTA

MILEPOST 7 TAILINGS BASIN
WEST RIDGE RAILROAD

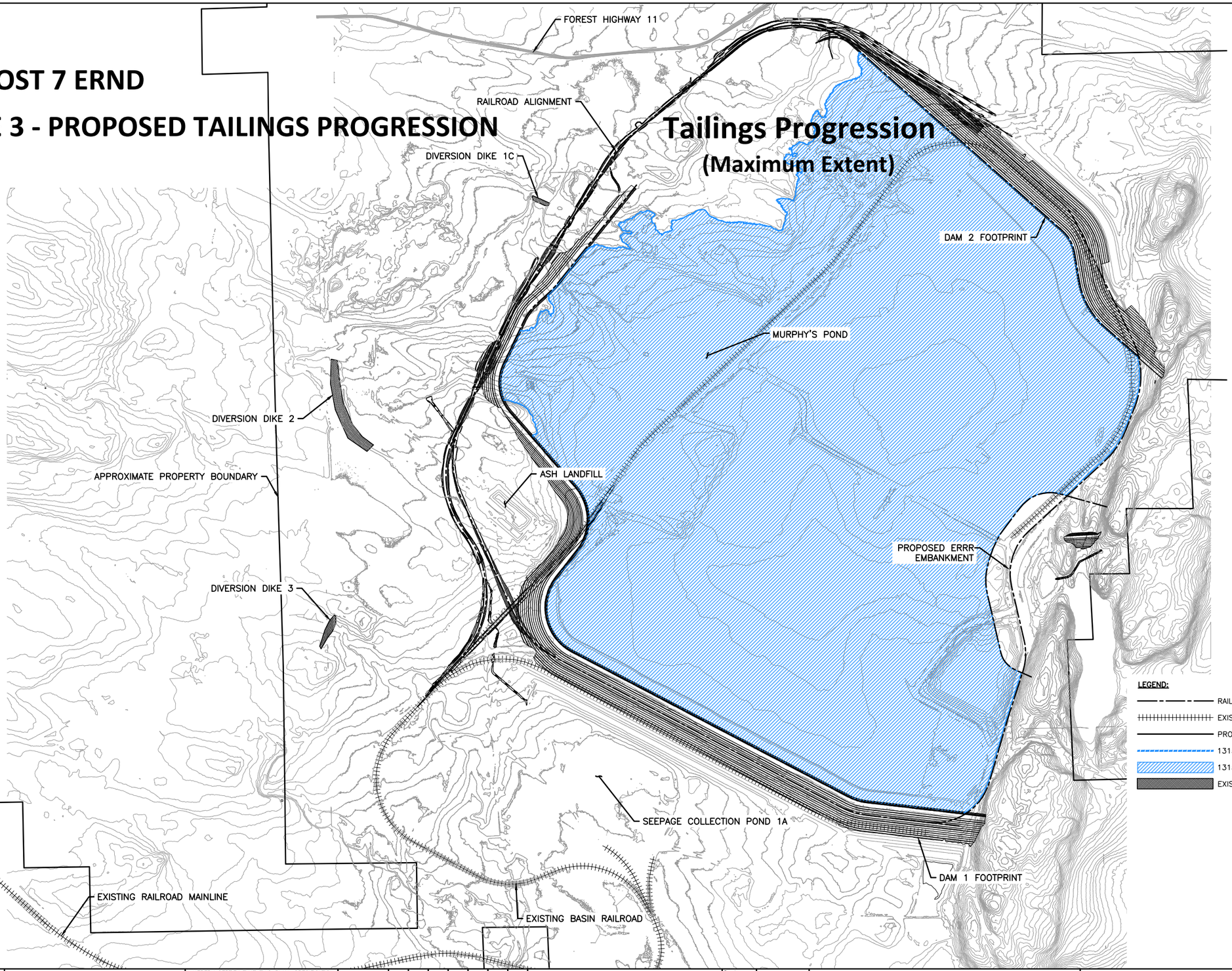
OVERALL
BASIN EXTENTS

BARR PROJECT No.	
23/38-1049	
CLIENT PROJECT No.	
DWG. No.	REV. No.
Q18	A

CADD USER: Greg Johnson FILE: M:\DESIGN\23380086.00\23380086 Q18.DWG PLOT SCALE: 1:2 PLOT DATE: 4/2/2021 8:11 AM
XREFS In Drawing - K:\Design\23380086.00\Basin Limits from ES.dwg
GSJ K:\Design\23381049.00\23381049_NSM WRRR C-01.dwg Plot at 1 03/08/2015 17:10:15

MILE POST 7 ERND

FIGURE 3 - PROPOSED TAILINGS PROGRESSION



NO.	BY	CHK.	APP.	DATE	REVISION DESCRIPTION

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DATE _____ REG. NO. _____

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CLIENT							
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CONSTRUCTION							
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Scale	AS SHOWN
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Drawn	GSJ
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Designed	GSJ
Approved	

NORTHSHORE MINING COMPANY
SILVER BAY, MINNESOTA

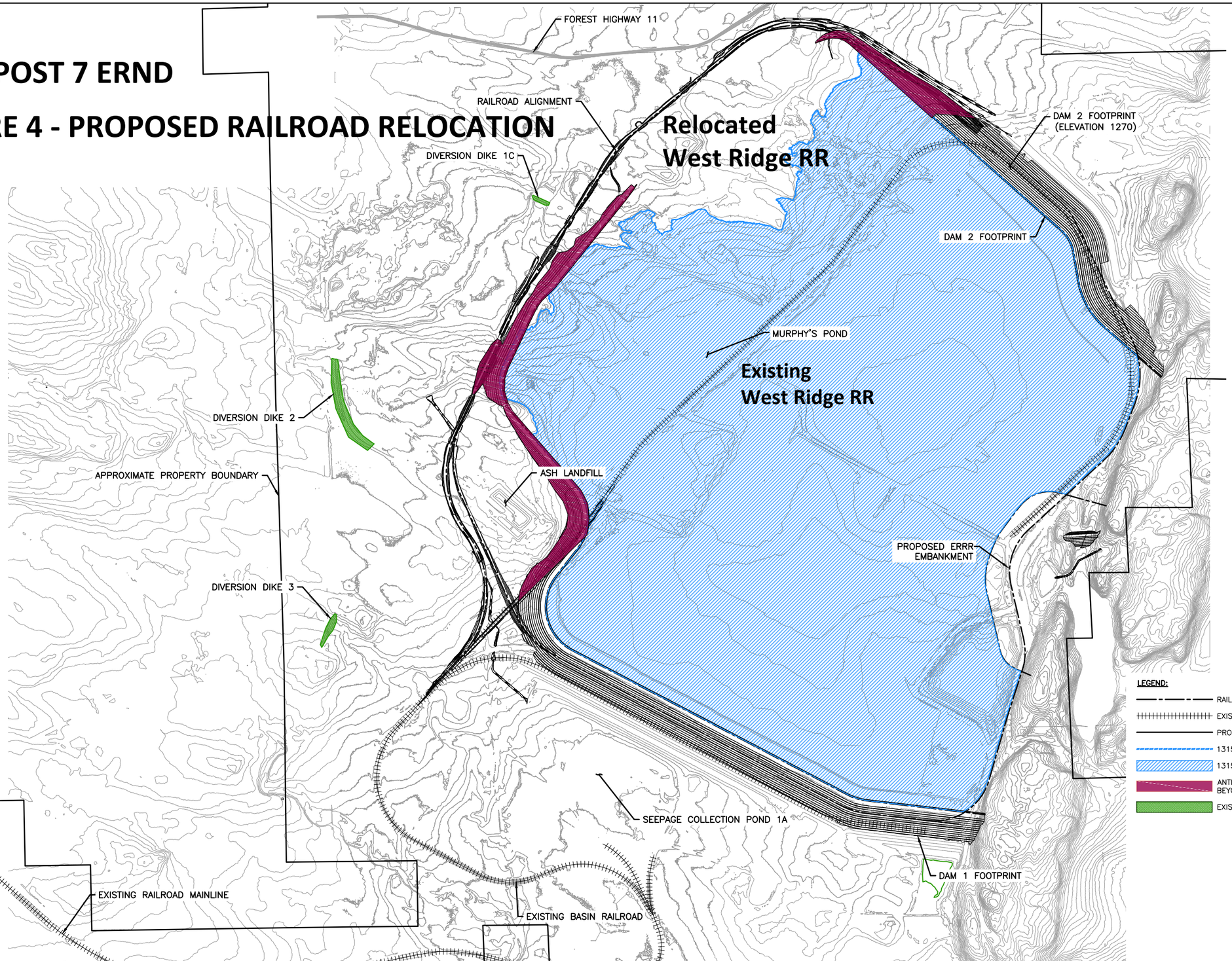
MILEPOST 7 TAILINGS BASIN
WEST RIDGE RAILROAD

OVERALL
BASIN EXTENTS

BARR PROJECT No. 23/38-1049
CLIENT PROJECT No.
DWG. No. PTM
REV. No. A

MILE POST 7 ERND

FIGURE 4 - PROPOSED RAILROAD RELOCATION



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Xrefs In Drawing - K:\Design\23380086.00\Basin Limits from ES.dwg
GSJ K:\Design\23381049.00\23381049_NSM WRRR C-01.dwg Plot at 1 03/08/2015 17:10:15

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DATE _____ REG. NO. _____

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BID							
CONSTRUCTION							
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Scale	AS SHOWN
Date	3/8/2015
Drawn	GSJ
Checked	LCH2
Designed	GSJ
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NORTHSHORE MINING COMPANY
SILVER BAY, MINNESOTA

MILEPOST 7 TAILINGS BASIN
WEST RIDGE RAILROAD

OVERALL
BASIN EXTENTS

BARR PROJECT No.	
23/38-1049	
CLIENT PROJECT No.	
DWG. No.	REV. No.
Q18	A

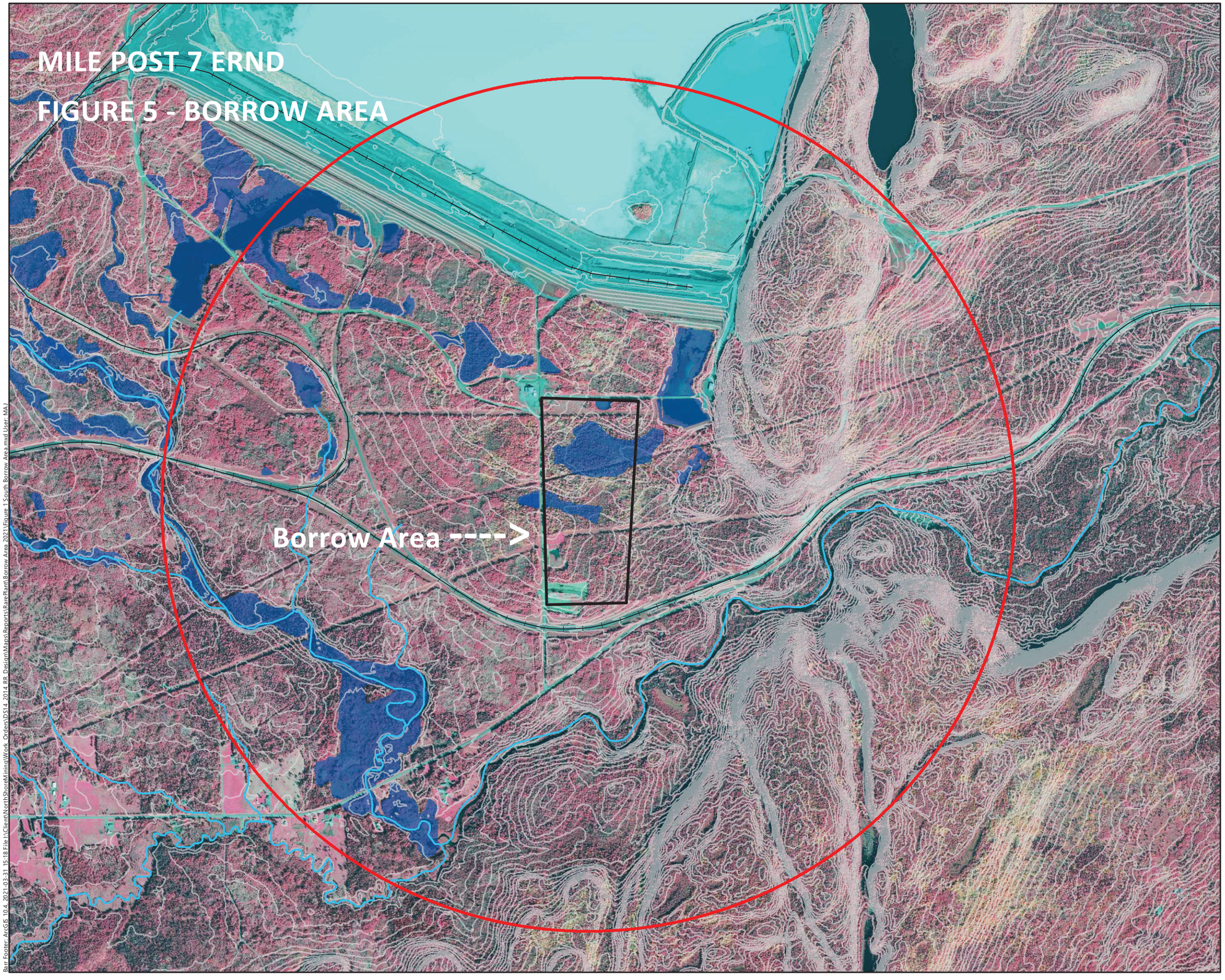
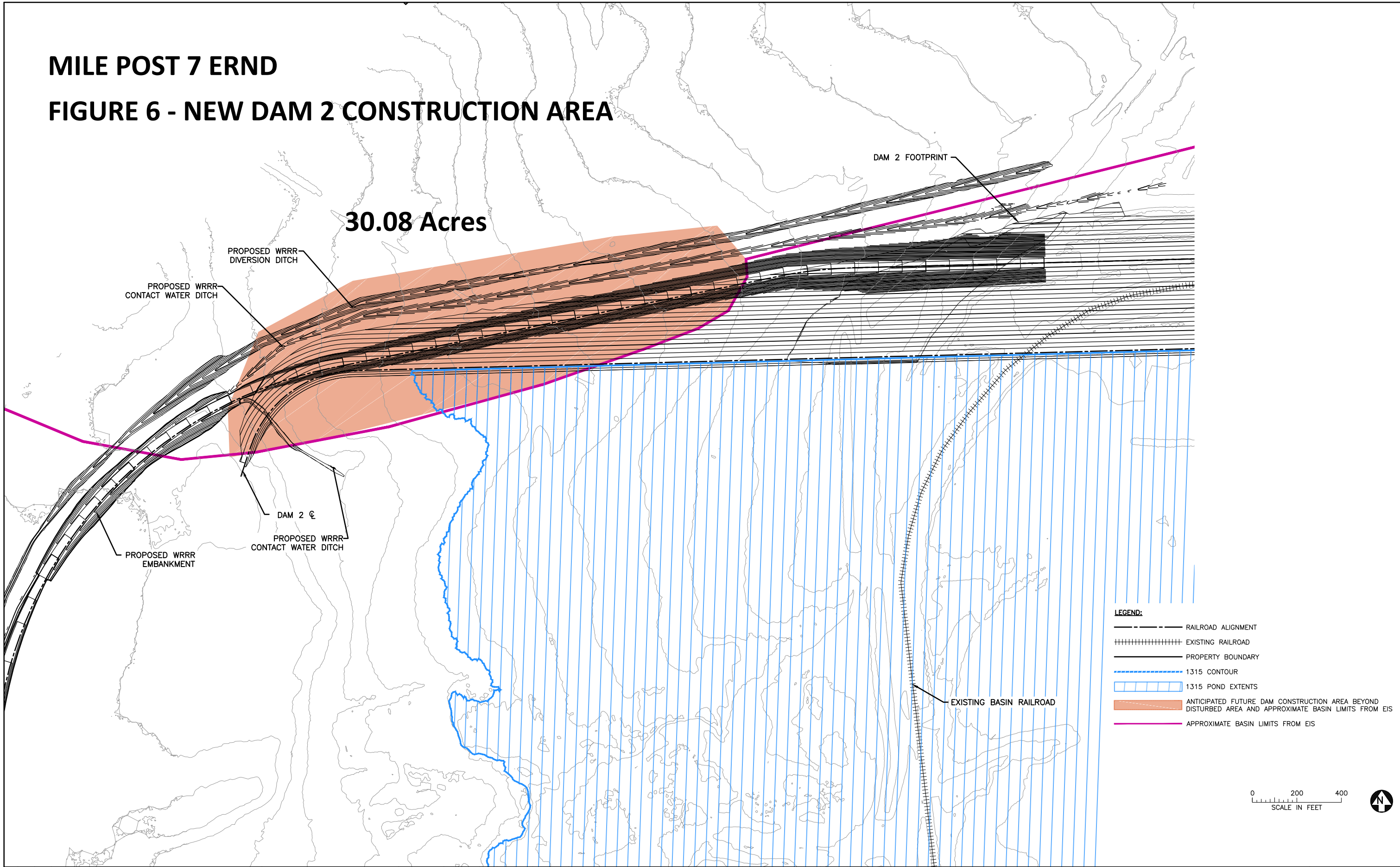


Figure 1
BORROW AREA
Milepost 7 Tailings Basin
Northshore Mining Company
Lake County, Minnesota

MILE POST 7 ERND

FIGURE 6 - NEW DAM 2 CONSTRUCTION AREA



NO.	BY	CHK.	APP.	DATE	REVISION DESCRIPTION

CLIENT	
BID	
CONSTRUCTION	
RELEASED TO/FOR	A B C 0 1 2 3
	DATE RELEASED

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Scale	AS SHOWN
Date	
Drawn	GSJ
Checked	LCH2
Designed	GSJ
Approved	

NORTHSHORE MINING COMPANY
SILVER BAY, MINNESOTA

MILEPOST 7 TAILINGS BASIN
WEST RIDGE RAILROAD

DAM 2 WEST
EXTENTS

BARR PROJECT No.	23/38-1049
CLIENT PROJECT No.	
DWG. No.	DAM 2W
REV. No.	A

Proposed D vers on D tch
GW-006, GW-007
SW-004
GW-001, GW-002, GW-013
Seepage Pond 2
SD-005
SW-001
Dam 2
728526 (ALF2R)
MW-4 (ALF9R)
728527 (ALF3R)
597366 (ALF4)
642508 (ALF1)
642507 (ALF5)
642509 (ALF7)
LS00086 (ALF8)
Ash Landfill
728528 (ALF6R)
Dam 5
GW-004, GW-005
SW-006 (inactive)
Reclaim Pond
Dam 1
WS-010
Seepage Pond 1A
GW-011, GW-012
WS-001
SD-004
SD-001
GW-008, GW-009, GW-010
SW-003
SW-002

MILE POST 7 ERND

FIGURE 7 - MONITORING LOCATIONS

Monitoring Locations

- Groundwater
- Surface Discharge
- Surface Water
- Waste Stream

Monitoring IDs
728528 (ALF6R)
MPCA NSM

- Approximate RR Construction Extents
- Project Area
- Ditches
- PBR Landfills
- 1975-76 Approved EIS Project Limits
- Proposed RR

0 1,500 3,000 6,000
Feet

Figure 1

Northshore Mining with Construction Extents
West Ridge RR Realignment

MILE POST 7 ERND

FIGURE 8 - POST-EIS FACILITIES

Coal Ash Landfill ---->

Coal Ash Landfill

Existing Tailings Basin

Dam 2

Dam 1

Dam 5

Seepage Pond 2-3

Seepage Pond 5

Rec a m Pond

Seepage Pond 1A

Seepage Pond 1B

<---- Water Treatment Plant

Existing Railroads

Water Treatment Plant

Reclaim Pond

Seepage Pond

0 2,000

Feet

Imagery: 2019 FSA via MnGeo

TAILINGS BASIN
EXISTING CONDITIONS
Northshore Mining Company
Lake County, Minnesota

Figure 1

BARR

Barr Footer: ArcGIS 10.6, 2021-04-06 10:51 File: i:\Client\NorthShoreMining\Work_Orders\DS14_2014_RR_Design\Maps\Reports\MilePost7_forAndrea\DNR Env Rev Need\Figure 1 - MP7 Existing Conditions.mxd User: maj

CLEVELAND-CLIFFS INC.
Northshore Mining Company
10 Outer Drive, Silver Bay, MN 56614
P 218.226.4125 F 218.226.6037 clevelandcliffs.com

December 15, 2020

Ms. Jennifer Engstrom
Minnesota Department of Natural Resources
500 Lafayette Road N.
St. Paul, MN 55155

Re: Permit to Mine Amendment Application – Mile Post 7 Basin Progression and Clay Borrow Sites

Dear Ms. Engstrom,

As discussed with DNR's Land and Minerals staff on different occasions, Northshore Mining Company (Northshore) is working through the permitting process to relocate its Mile Post 7 railroad and progress the tailings basin to its final footprint as projected in the State of Minnesota's 1976 Environmental Impact Statement (EIS) and the 1977 Federal EIS. As Northshore has worked through the engineering and design process for the final dams and railroad alignment, the following adjustments must be made to the Permit to Mine:

1. The final footprint of Mile Post 7 as projected in the 1976 State EIS will need to be adjusted slightly at Dam 2 as shown on Figure 1.
2. To support the continued clay core construction of Dam 5, various clay-borrow sites at Mile Post 7 have been identified for use. As discussed with DNR's Andrew Reed and Thomas Lee, the areas being sourced for clay must be included as borrow sources in the Permit to Mine, as shown in Figure 2.

1) Mile Post 7 Final Footprint

Northshore has been in the process of designing and engineering its new railroad realignment and basin progression for the past several years and has enough preliminary engineering completed to know the approximate boundary of the dams, tailings pond and railroad for the life of mine. Of the approximately 1,200-acre progression of the tailings basin, there are 30.08 acres of dam construction that fall outside of the original Permit to Mine boundary for Mile Post 7. The original Permit to Mine did not forecast the specific locations of the railroad segments through time, so each realignment has been engineered as it has been needed. The 30.08-acre area described above is necessary to meet the safety requirements for the rail's curvature and percent grade over the north and west ends of Dam 2.

2) Clay Borrow Pits

Northshore's Dam 5 construction contains a clay core that requires a steady source of compatible clay materials for continued construction. Northshore has identified several areas on Northshore property surrounding the tailings basin that would yield approved clay for construction purposes. As a result, Northshore is proposing to remove clay in these identified areas and reclaim them as required under the Mineland Reclamation rules under MN Rules Chapter 6130, Ferrous Metallic Mineral Processing. The potential borrow areas are scattered within the polygon found on Figure 2. Wetlands in the polygon have been delineated by a third-party consultant and will not be impacted without necessary permitting if the need presents itself. At this time, there is adequate clay in upland areas, and no wetland permitting is forecasted. Clay removal activities and reclamation will be reported annually

(temporary and permanent) through the Annual Report and Operating Plan due January 31st of every year.

Financial Assurance Considerations

Northshore currently holds an irrevocable Letter of Credit for $4M to cover various closure costs at Mile Post 7. The financial assurance applies to portions of permits specific to the construction and operation of Mile Post 7 and the ongoing operation of the water treatment plant. Because the 30.08 acres outside of the permit to mine boundary will consist of Dam 2, a dam that was already considered for the original closure costs, no additional reclamation costs would be incurred. It's simply an adjusted footprint. Additionally, the clay borrow sites are small in nature, and would require limited grading and appropriate seeding for reclamation purposes; an amount that would not be material enough to warrant a change to the existing $4M financial assurance.

Related Regulatory Approvals

Permitting for Northshore's tailings basin progression and railroad relocation project began in 2015 with the Minnesota Department of Natural Resources (DNR) and US Army Corps of Engineers (USACE). In 2016, the Minnesota Pollution Control Agency (MPCA) was brought in to assist the DNR with its Needs Determination to document whether or not a supplemental state Environmental Impact Statement (EIS) would be needed for the final progression of Mile Post 7 tailings basin. The original state EIS was completed in 1976 and reviewed a tailings storage facility that supported the projected life of mine.

Completion of the ultimate tailings basin footprint will require Northshore to: cut off the current West Catchment Diversion Ditch (constructed in 2005), route the drainage it manages back into the tailings basin; move the railroad to its final location around the west side of the basin footprint; and extend the dams to their final designed footprint. This work is required to contain the tailings deposited in the Mile Post 7 basin as they rise and naturally progress up the western slope of the basin.

Permits that regulate the activities at NSM's Mile Post 7 tailings basin have been evaluated as part of this project. The following list describes the status of each applicable permit amendment, including this permit to mine amendment application:

- USACE Permit - Section 404 of the Clean Water Act – In progress
    - Watershed Assessment of the HUC10 watershed that includes the direct, indirect and cumulative effects on the following:
        - Subwatershed and drainage patterns
        - Wetlands, streams, ditches, rivers, floodplains, streamflow, lakes and deepwater habitat
        - Water quality
        - Fish and macroinvertebrates
        - Forest resources
    - Mitigation Plan for wetland and stream impacts
    - Section 106 of the National Historic Preservation Act
        - Tribal consultation (Fond du Lac, Bois Forte, Grand Portage, Bad River)
        - State Historic Preservation Office consultation
    - Endangered Species Act consultation with the US Fish and Wildlife Service
    - Section 401 of the Clean Water Act - Certification (MPCA) antidegradation rules
- DNR Permit to Mine amendment – In progress
    - Will include a 30.08 acre tailings basin boundary adjustment to reflect adjustments to the original dam configuration based on updated engineering and the addition of clay borrow sites to support the ongoing construction of the clay core of Dam 5.

- DNR Water Conservation Act Permit - Complete
    - Wetland impacts and mitigation have been approved
- DNR Needs Determination – Complete
    - No supplemental EIS required
- DNR Water Appropriations - Complete
    - No action required
- MPCA Air Permit – Complete
    - No action required
- MPCA Permit by Rule (PBR) landfills – Complete
    - Directed by MPCA to remove from basin footprint prior to inundation by tailings
- MPCA SW-409 Permit Amendment/Reissuance – Complete
    - Reissuance allows for the construction of an isolation dam between the ash landfill and the basin pond.
- MPCA SW-409 Permit – Planned for future
    - Facility Description modification needed to address PBR landfills
    - Application not yet submitted (not anticipated to need an updated permit within the next 12 months)
- MPCA Construction Stormwater – Planned for future
    - As needed for construction areas outside of NPDES boundary
    - Permit requirement will likely not be triggered until Spring 2021 or later
- NSM Stormwater Pollution Prevention Plan – Planned for future
    - Revise figure showing collection area treated and monitored by an NPDES outfall
- MPCA MN0055301 NPDES/SDS Permit – In Progress
    - Working through Five Year Operations Plan approval
- MPCA/DNR Five Year Operations Plan – In Progress
    - Approved by DNR
    - Awaiting MPCA approval

Timing

Though other permits are required to be secured by 1Q2021 to avoid construction schedule delays (i.e. WCA Permit and USACE's 404 Permit), the timing needs of the permit to mine amendment are different. The impact to the area along Dam 2 that lies outside of the PTM boundary, assuming full production year round, will be impacted by dam construction no sooner than 2026. Constructing the foundation for the railroad however, may begin prior to 2026. The clay borrow sites have already been discussed with DNR during a site visit and will be incorporated through this amendment. The use of this clay source will be ongoing for many years.

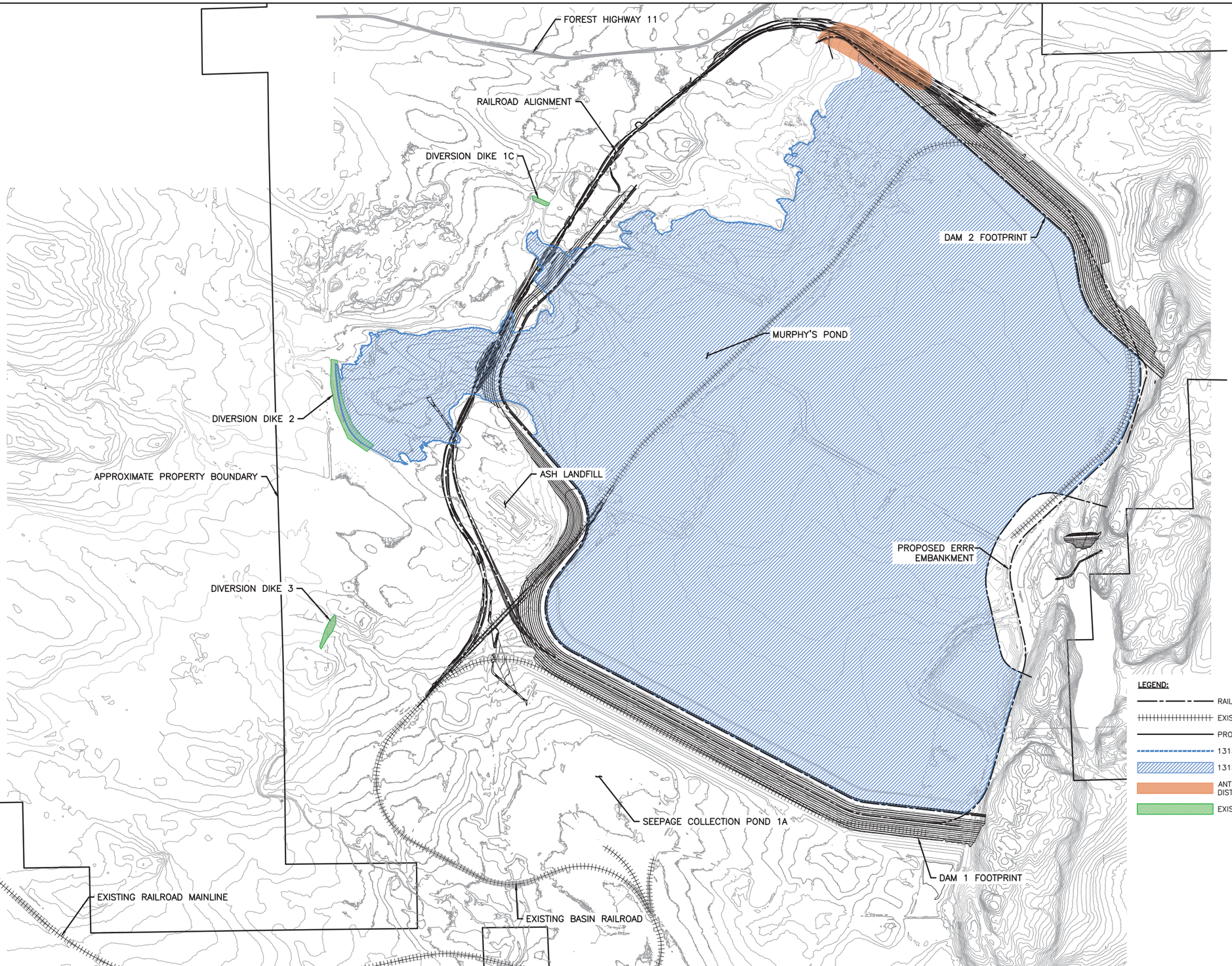
Northshore very much appreciates the time DNR has spent to date understanding the background of this permit amendment request and looks forward to future discussions.

Sincerely,

Andrea Hayden, Environmental Manager
Northshore Mining Company

Cc: Katie Larson – MNDNR
Paul Carlson – Northshore
Scott Gischia – Cleveland-Cliffs, Inc.

Figure 1



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Xrefs in Drawing – K:\Design\23380086.00\Basin Limits from EIS.dwg
GSJ K:\Design\23381049.00\23381049_NSM WRRR C-01.dwg Plot at 1 03/08/2015 17:10:15

NO.	BY	CHK.	APP.	DATE	REVISION DESCRIPTION

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SIGNATURE _____

PRINTED NAME _____

DATE _____ REG. NO. _____

	A	B	C	0	1	2	3
CLIENT							
BID							
CONSTRUCTION							
RELEASED TO/FOR	DATE RELEASED						

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Corporate Headquarters:
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Scale	AS SHOWN
Date	3/8/2015
Drawn	GSJ
Checked	LCH2
Designed	GSJ
Approved	

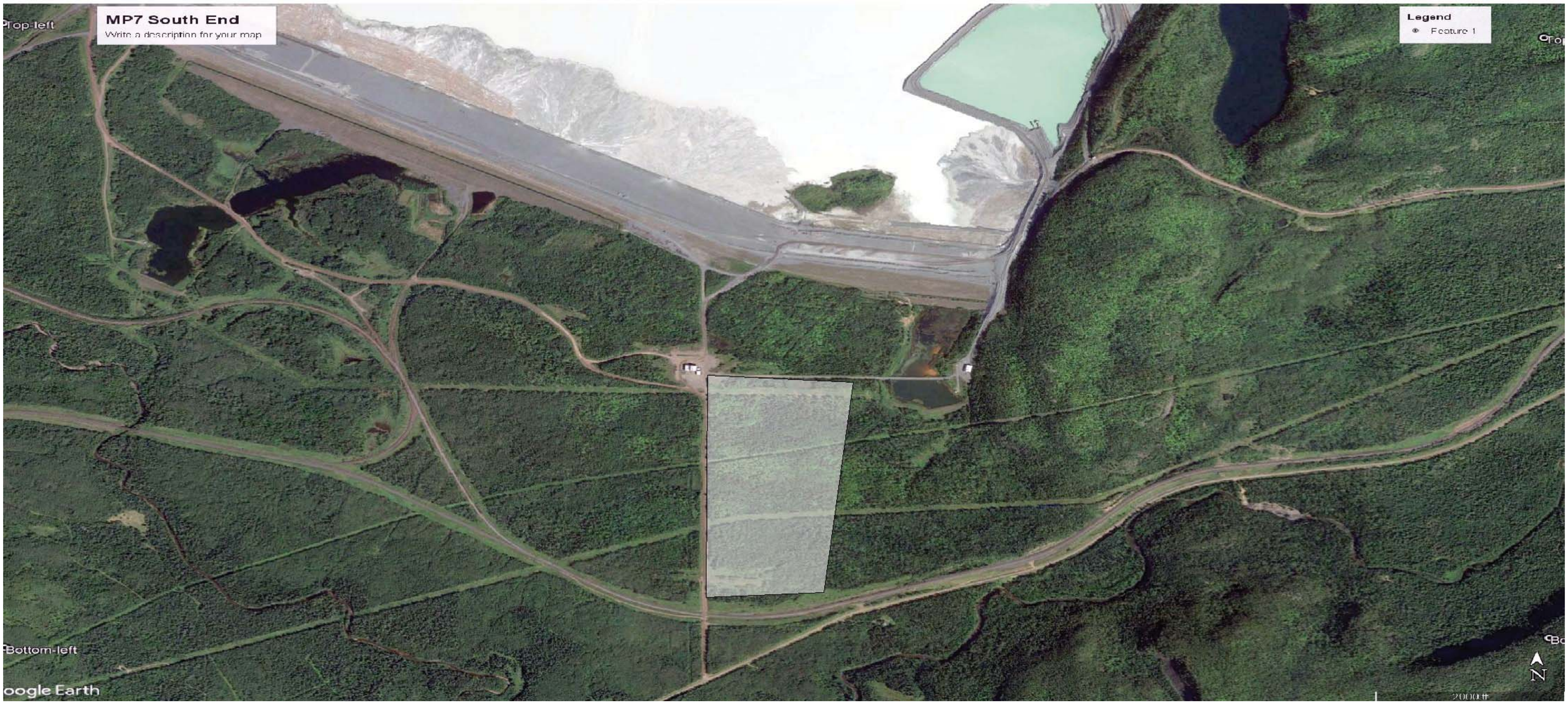
NORTHSHORE MINING COMPANY
SILVER BAY, MINNESOTA

MILEPOST 7 TAILINGS BASIN
WEST RIDGE RAILROAD

OVERALL
BASIN EXTENTS

BARR PROJECT No.	23/38-1049
CLIENT PROJECT No.	
DWG. No.	PTM
REV. No.	A

Figure 2


MP7 South End
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Legend
Feature 1
Bottom-left
oogle Earth
N
2000 ft

MILE POST 7 ERND

ATTACHMENT 2 - DRAFT EIS FIGURE 16

ENVIRONMENTAL IMPACT STATEMENT

RESERVE MINING COMPANY ON-LAND TAILINGS DISPOSAL PLAN

16 PROPOSED MILE POST 7 PLAN, TAILINGS BASIN AND ANCILLARY FACILITIES

LEGEND

- TAILINGS BASIN
- PROPOSED SITE BOUNDARY

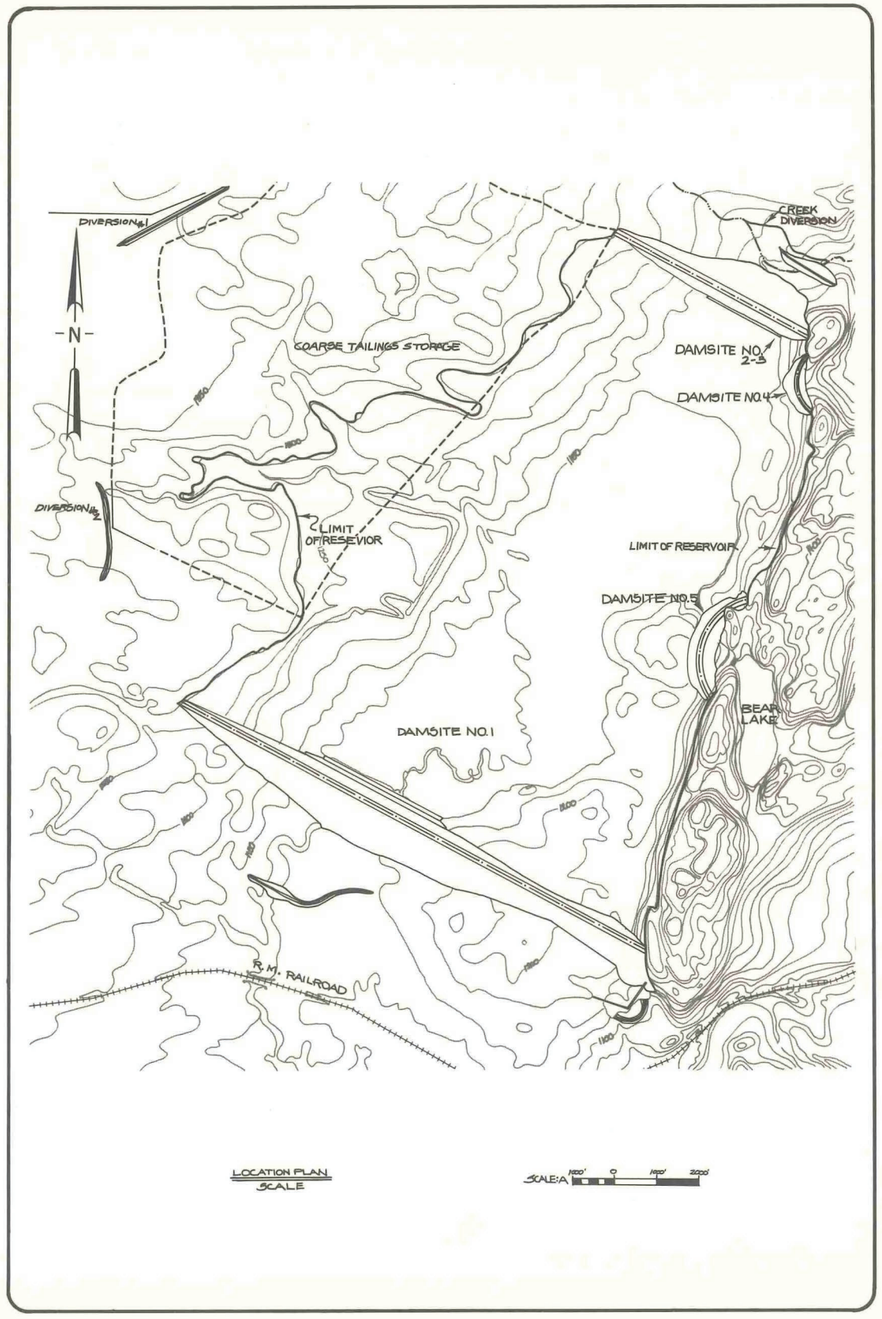
SOURCE: Reserve Mining Company

BARTON-ASCHMAN ASSOCIATES, INC.

MINNEAPOLIS/ST. PAUL, MINNESOTA 55454

MILE POST 7 ERND

ATTACHMENT 3 - DRAFT EIS FIGURE 3



ENVIRONMENTAL IMPACT STATEMENT

RESERVE MINING COMPANY ON-LAND TAILINGS DISPOSAL PLAN

3 PROPOSED MILE POST 7 DISPOSAL AREA

SOURCE: Reserve Mining Company

BARTON-ASCHMAN ASSOCIATES, INC.

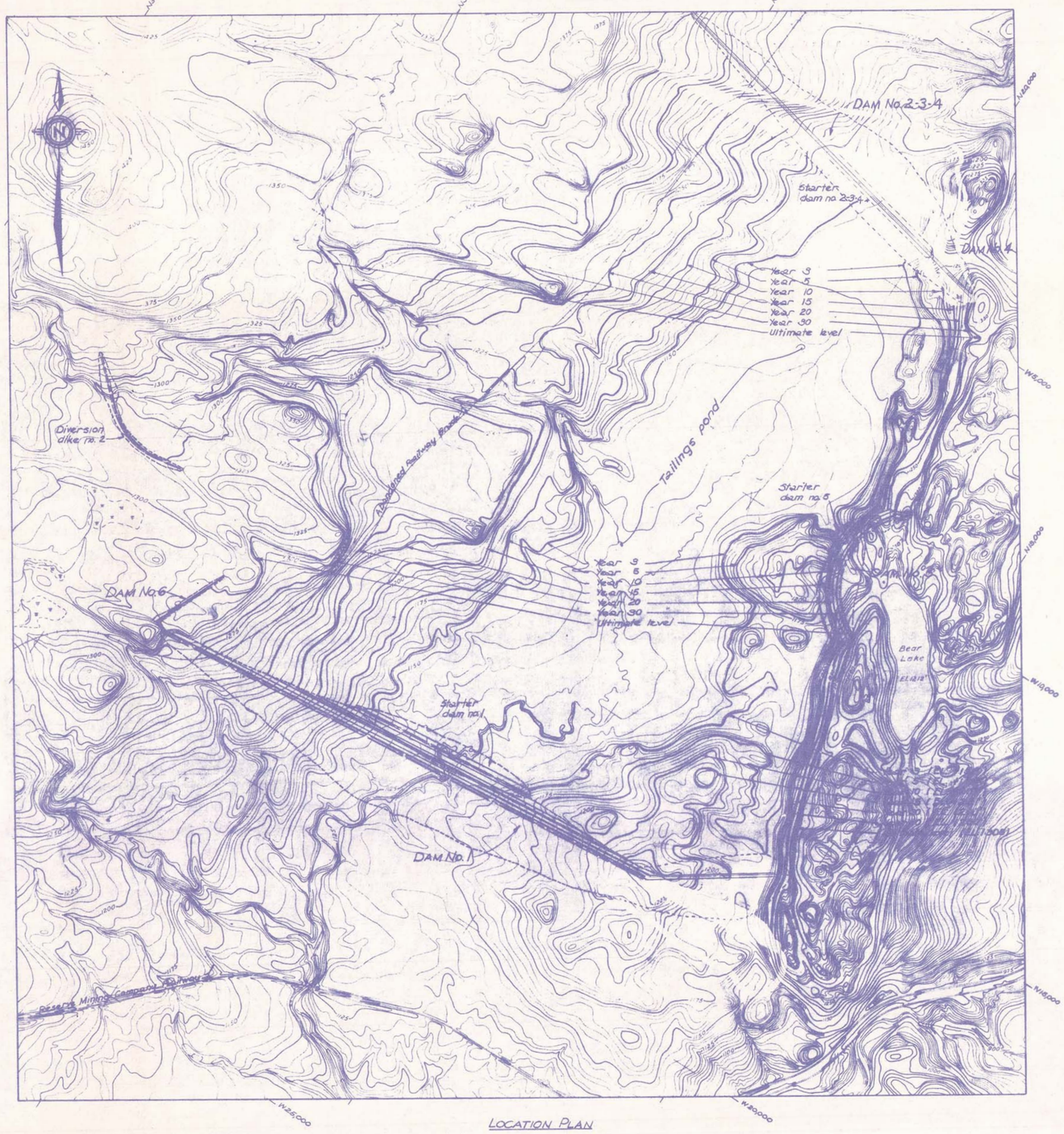
MINNEAPOLIS/ST. PAUL, MINNESOTA 55454

292-0133

MARK	NO. REQD.	DESCRIPTION	ORDER NO.

MILE POST 7 ERND

ATTACHMENT 4 - ENGINEERING DESIGN FIGURE C-18



LOCATION PLAN
Scale: A

NOTES:

1. The pond levels on this drawing are the design pond levels as shown on Drawing No. 292-0180.
2. Times shown refer to May 0, year 0 (Approval for construction).

REFERENCE DRAWINGS:

292-0120	General Layout and Location Plan
292-0132	Clearing Limits
292-0180	Volume Design Curves - Pond Volume, Area and Raising Rate.

FIGURE C-18

Scale A 1000' 0 1000' 2000'

REVISIONS NO.	DATE	DESCRIPTION	BY
–	May 21, '76	Preliminary - Issued to Reserve Mining Company	
1	July 14, '76	Note 2 revised.	
2		GENERAL REVISION	JG

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Registered Professional Engineer under the laws of the State of Minnesota.
Date August 1976 Reg. No. 11100

Klohn Leonoff Consultants Ltd.
CIVIL & GEOTECHNICAL ENGINEERS
VANCOUVER - CALGARY - WINNIPEG, CANADA

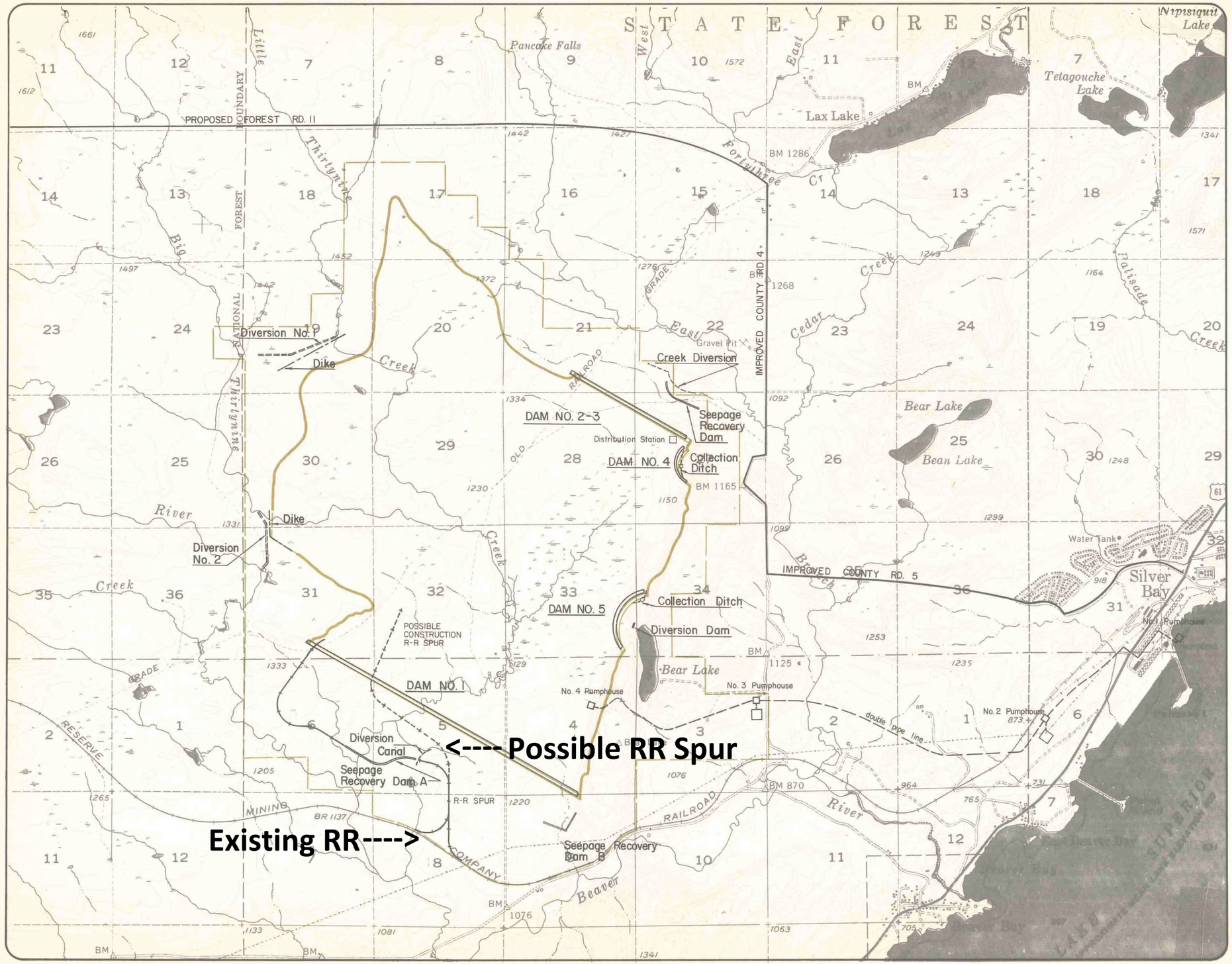
LOCATION	SILVER BAY, MINNESOTA
	RESERVE MINING COMPANY
DEPARTMENT	DAM SITES
DRAWN	L.C.G. April 26 '76
CHECKED	RDS
ENGINEER	WGH
APPROVED	
SCALE	AS SHOWN

MILE POST No. 7 SITE
TAILING DISPOSAL AREA
TAILINGS POND
EXTENT WITH TIME

292-0133
REVISION 1

MILE POST 7 ERND

ATTACHMENT 5 - POSSIBLE RAILROAD SPUR



ENVIRONMENTAL IMPACT STATEMENT

RESERVE MINING COMPANY ON-LAND TAILINGS DISPOSAL PLAN

16 PROPOSED MILE POST 7 PLAN, TAILINGS BASIN AND ANCILLARY FACILITIES

LEGEND

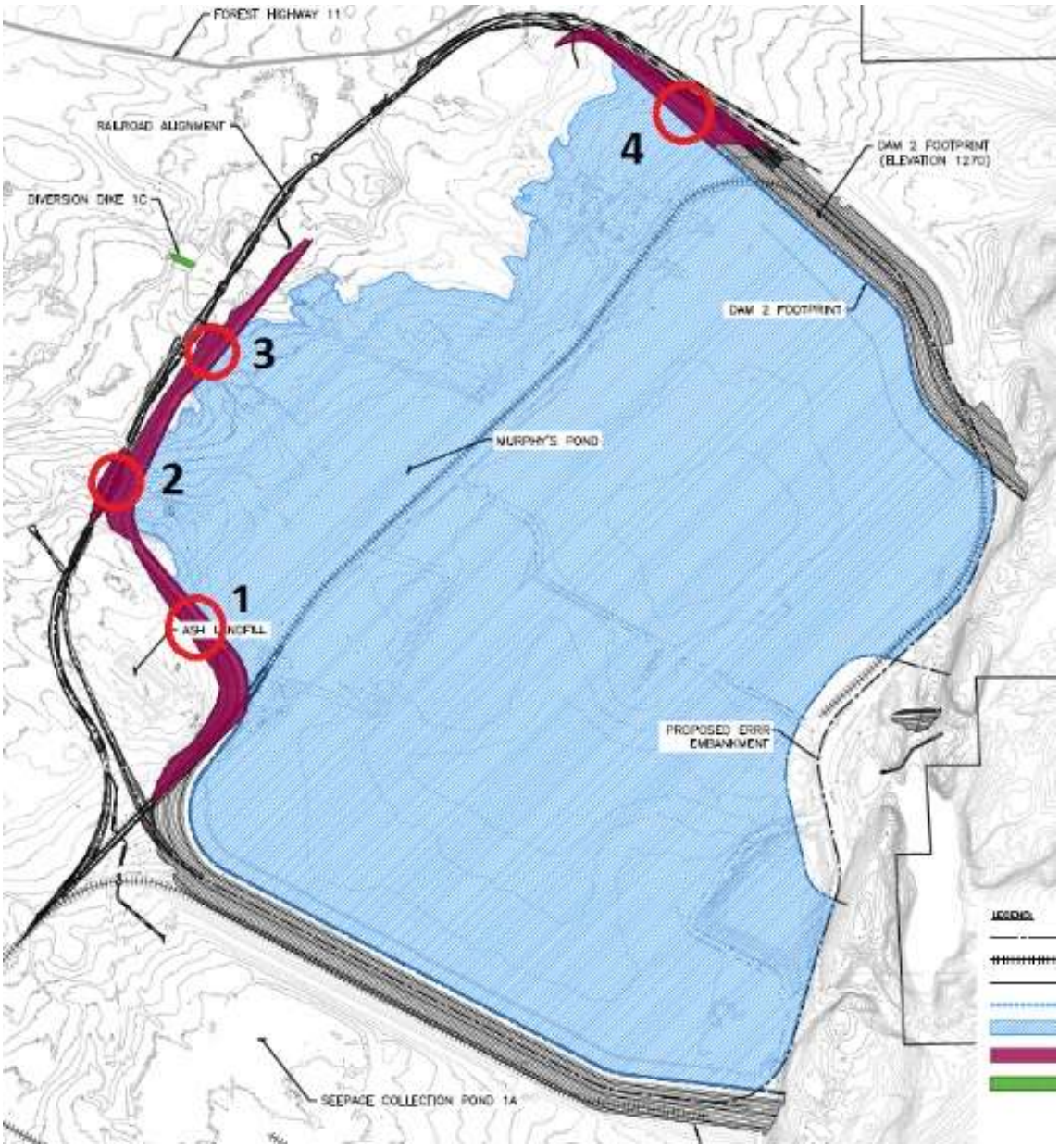
- TAILINGS BASIN
- PROPOSED SITE BOUNDARY

SOURCE: Reserve Mining Company

BARTON-ASCHMAN ASSOCIATES, INC.

MINNEAPOLIS/ST. PAUL, MINNESOTA 55454

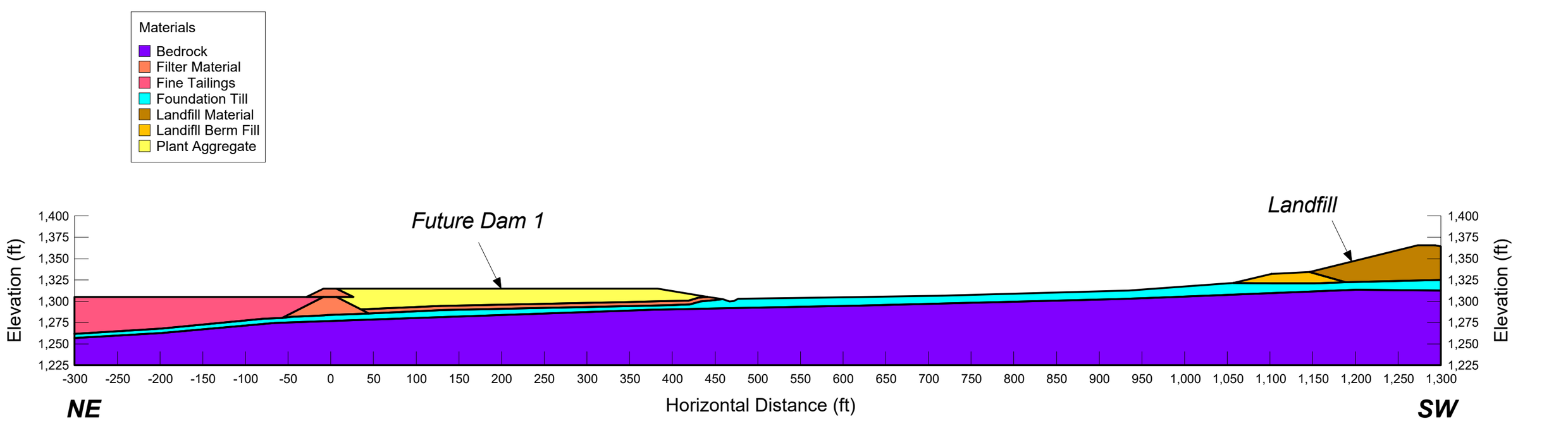
MILE POST 7 ERND
ATTACHMENT 6 - SELECT LOCATIONS X-SECTIONS



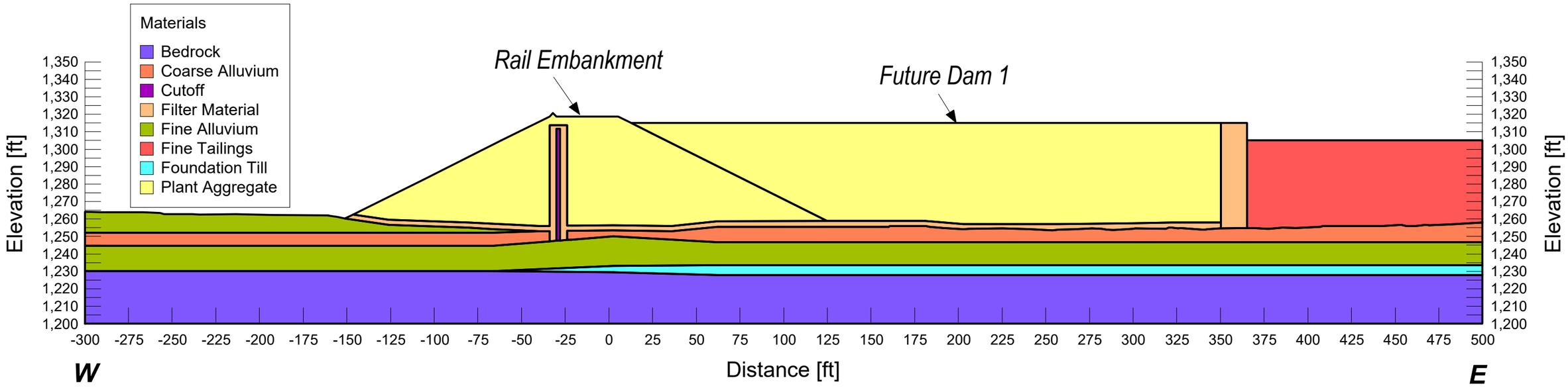
MILE POST 7 ERND

ATTACHMENT 7 - SIMPLIFIED X-SECTIONS

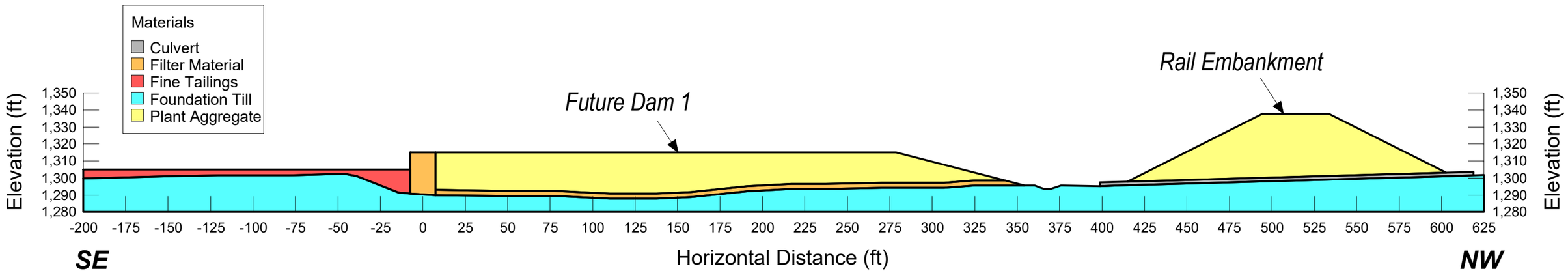
Simplified Cross Section 1
Future Dam 1 and Landfill



Simplified Cross Section 2
West Ridge Railroad Embankment and Future Dam 1



Simplified Cross Section 3
West Ridge Railroad Embankment and Future Dam 1



Simplified Cross Section 4
West Ridge Railroad Embankment and Future Dam 2

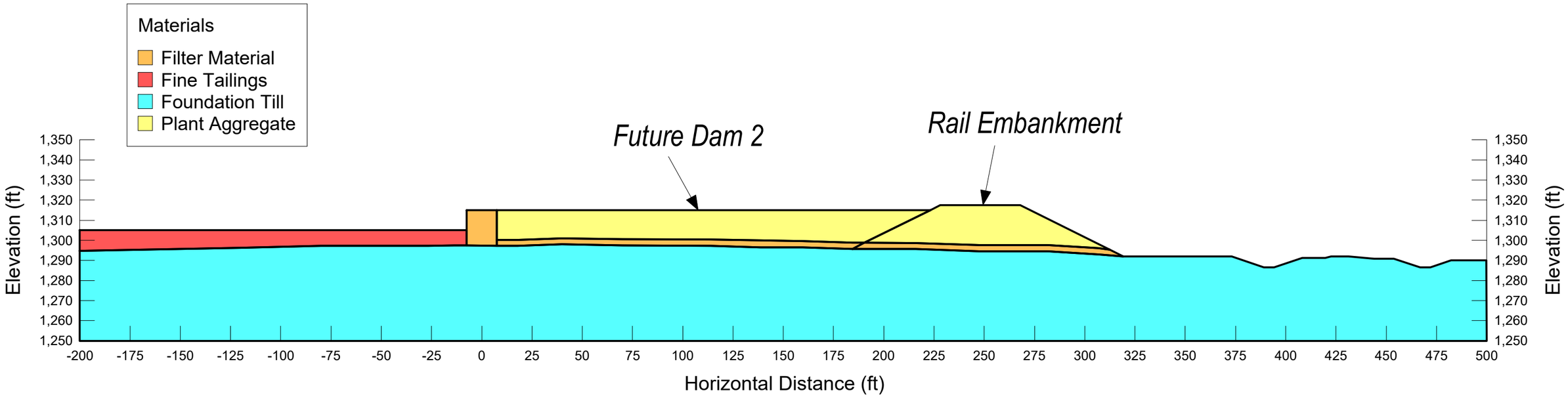


Table 3 Computed Factors of Safety for Various Scenarios - Dam 1

Slope Location and Material Configuration (Dam Crest - 1,245 feet)	Factor of Safety for Pond Scenarios				Minimum Acceptable FOS*
	Tailings Pond at 1,212.8 ft (Existing)	Tailings Pond at 1,235 ft, Above Existing Beach	Tailings Pond at 1,235 ft, Future Beach	Tailings Pond at 1,242 ft, Above Future Beach	
ESSA	2.45	2.42	2.43	2.42	**1.5**
ESSA Block Failure	2.26	2.21	2.22	2.19	**1.5**
USSA, Fine Tailings Yield Strength	1.60	1.58	1.58	1.58	**1.3**
USSA, Fine Tailings Yield Strength, Block Failure	1.52	1.47	1.47	1.45	**1.3**
USSA, Fine Tailings Liquefied Strength	1.57	1.53	1.53	1.51	**1.05**
USSA, Fine Tailings Liquefied Strength, Block Failure	1.41	1.36	1.37	1.35	**1.05**

***NOTE: DNR accepts the following values for minimum Factors of Safety: ESSA = 1.50; USSA = 1.30; and liquefied = 1.10.**

Table 4 Computed Stability Factors of Safety for Various Scenarios - Dam 2

Slope Location and Material Configuration	Factors of Safety for Dam 2 Crest Elevation 1,248 feet				Minimum Acceptable FOS*
	Tailings Pond at 1,215.3 feet (Existing Spring 2014)	Tailings Pond at 1,238 feet, Existing Beach (10-foot freeboard)	Tailings Pond at 1,238 feet, Future Beach at 1238 feet (10-foot freeboard)	Tailings Pond at 1,245 feet, Future Beach at 1238 feet (3-foot freeboard)	
Downstream Slope, ESSA	2.85	2.84	2.85	2.84	**1.5**
Downstream Slope, ESSA Block Failure	2.91	2.91	2.91	2.91	**1.5**
Downstream Slope, Operational Conditions	1.75	1.74	1.74	1.74	**1.3**
Downstream Slope, Operational Conditions, Block Failure	1.77	1.76	1.76	1.76	**1.3**
Downstream Slope, USSA	1.77	1.76	1.77	1.76	**1.3**
Downstream Slope, USSA, Block Failure	1.75	1.75	1.75	1.75	**1.3**
Downstream Slope, USSA, Fine Tailings Liquefied Strength	1.76	1.75	1.76	1.75	**1.05**
Downstream Slope, USSA, Fine Tailings Liquefied Strength, Block Failure	1.76	1.76	1.76	1.76	**1.05**

***NOTE: DNR accepts the following values for minimum Factors of Safety: ESSA = 1.50; USSA = 1.30; and liquefied = 1.10.**

Table 5 Computed Factors of Safety for the Downstream Slope of Dam 5

Slope Location and Material Configuration	Minimum Acceptable Factor of Safety*	Resulting Model Factor of Safety	
		Mid-Slope Failure	Large Failure
Normal Operating Pool (10 feet below crest)			
Downstream Slope, ESSA	**1.5**	2.14	2.44
Downstream Slope, ESSA Block Failure	**1.5**	2.32	2.37
Downstream Slope, USSA	**1.3**	1.39	1.68
Downstream Slope, USSA, Block Failure	**1.3**	1.41	1.66
Flood Pool			
Downstream Slope, ESSA	**1.5**	2.10	2.38
Downstream Slope, ESSA Block Failure	**1.5**	2.28	2.35
Downstream Slope, USSA	**1.3**	1.30	1.63
Downstream Slope, USSA, Block Failure	**1.3**	1.31	1.46

***NOTE: DNR accepts the following values for minimum Factors of Safety: ESSA = 1.50; USSA = 1.30; and liquefied = 1.10.**