U.S. STEEL KEETAC TACONITE MINE EXPANSION PROJECT

Draft Environmental Impact Statement

DEIS Executive Summary

December 2009

Prepared by

Minnesota Department of Natural Resources

in cooperation with

U.S. Army Corps of Engineers

Executive Summary

1. PURPOSE AND NEED FOR EIS

> The EIS is intended to provide information to units of government on the environmental impacts of a project before approvals or necessary permits are issued and to identify measures necessary to avoid, reduce, or mitigate adverse environmental effects.

The Proposed Project requires an Environmental Impact Statement (EIS) under the National Environmental Policy Act (NEPA). The Project Proposer has also agreed to complete a voluntary EIS under the Minnesota Environmental Policy Act (MEPA). The Minnesota Department of Natural Resources (MNDNR) and United States Army Corps of Engineers (USACE) have jointly prepared this EIS to evaluate the Proposed Project in accordance with MEPA, Minnesota Statute §116D, and NEPA, 42 USC §§ 4321-4347.

Although not mandatory under MEPA, the Project Proposer and the MNDNR agreed that a voluntary EIS would be prepared for the Proposed Project in accordance with Minnesota Rules, part 4410.2000, subp. 3B. The EIS is required to meet the applicable requirements of Minnesota Rules, parts 4410.0200 to 4410.7800 that govern the Minnesota Environmental Review Program.

The purpose of an EIS is to:

- Evaluate a proposed project's potentially significant environmental and socioeconomic effects,
- Consider reasonable alternatives,
- Explore mitigation measures for reducing or avoiding adverse effects, and
- Provide information to the public and to project decision-makers.

The Draft Environmental Impact Statement (DEIS) is intended to provide information to units of government on the environmental, economic and social impacts of a project before approvals or necessary permits are issued and to identify measures necessary to avoid, reduce, or mitigate adverse environmental effects. An EIS is not a means to approve or deny a proposed project.

In September 2008, the MNDNR in partnership with the USACE prepared a Scoping Environmental Assessment Worksheet (SEAW) and a Draft Scoping Decision Document (DSDD) to provide information about the project, identify potentially significant environmental effects, and determine what issues and alternatives would be addressed in the EIS. Public notification and opportunities to receive information and public comment on the project began during the project scoping process.

A public meeting was held on October 1, 2008, at the Nashwauk-Keewatin High School in the City of Nashwauk to provide additional information on the project and allow for comments (verbal and written) and questions. The comments received during the scoping period were considered as part of the scoping process, prior to the agencies issuing the Final Scoping Decision Document (FSDD) on November 5, 2008. On November 17, 2008, the USACE published a Notice of Intent (NOI) to prepare an EIS in the Federal Register.

A. Final Scoping Decision Document

The FSDD satisfies the scoping requirements of MEPA and NEPA and serves as the blueprint for preparing the EIS for the project. Both the SEAW and FSDD are included in this document as Appendix A and B, respectively. Responses to public comments received during the scoping process are included in Appendix C.

Environmental issues identified and described in the SEAW were placed into three categories in the FSDD by significance and level of analysis required in the EIS. These categories are briefly described below along with a list of topics that are included in each category. The FSDD describes in greater detail the issues and analyses to be included in the EIS for each topic area.

The following topics were reviewed and considered by the MNDNR and the USACE in the SEAW. It was determined that these topics were not relevant or were so minor that they would not be addressed in this EIS:

- Water surface use
- Vehicle-related air emissions
- Compatibility with plans and land use management regulations

The MNDNR and USACE determined that the following topics are not expected to present potentially significant impacts, but would be addressed in the EIS using limited information beyond that provided in the SEAW, commensurate with the anticipated impacts. These specific topics are addressed in Chapter 6.0 and include:

- Land Use
- Cover Types
- Water-Related Land Use Management Districts
- Erosion and Sedimentation
- Surface Water Runoff/Water Quality
- Geologic Hazards and Soil Conditions
- Solid Wastes, Hazardous Wastes, and Storage Tanks
- Traffic Impacts
- Odors, Noise, and Dust
- Amphibole Mineral Fibers
- Mineland Reclamation
- Socioeconomics
- Infrastructure and Public Service
- Visual Impacts
- Recreational Trails
- Federal Trust Responsibilities to Indian Tribes
- Historic Properties

The MNDNR and USACE identified the following topics in the FSDD that may result in potentially significant impacts and would include a substantial amount of additional information in the EIS beyond that included in the SEAW. These specific topics are addressed in Chapter 4.0 and include:

- Fisheries and Aquatic Resources
- Wildlife Resources
- Threatened and Endangered Species
- Physical impacts on Water Resources and Wetlands
- Water Appropriations
- Wastewater/Water Quality
- Stationary Source Air Emissions
- Human Health

The FSDD determined that the EIS would also address the potential cumulative effects associated with combined environmental effects of the Proposed Project and of past, present and reasonably foreseeable future actions. The cumulative effects analyses are presented in Chapter 5.0 and include:Biomass

- Climate Change
- Aquatic Habitat and Fisheries
- Wild Rice Resources (added after scoping)

- Mercury Emissions, Deposition, and Bioaccumulation
- Wildlife Habitat Loss/Fragmentation and Travel Corridor Obstruction
- Threatened and Endangered Species and Species of Concern
- Stream Flow and Lake Level Changes
- Inter-basin Transfer of Water
- Loss of Wetlands
- Wastewater/Water Quality
- Class I Areas – Potential Impact to Air Quality
- Ecosystem Acidification Resulting from Deposition of Air Pollutants
- Human Health
- Ecological health

B. Agency Roles

The MNDNR serves as the lead state agency in preparing this joint state/federal EIS and has coordinated with other state agencies (i.e., Minnesota Pollution Control Agency [MPCA] and the Minnesota Department of Health [MDH]) and will participate with the USACE at a public meeting or other public involvement pursuant to NEPA and MEPA. The MNDNR will be responsible for determining EIS adequacy pursuant to MEPA and will prepare the state Record of Decision (ROD).

The USACE is the lead federal agency in preparing this joint state/federal EIS. The USACE has determined that its action on the Clean Water Act (CWA) Section 404 permit would be a major federal action that has the potential to significantly affect the quality of the human environment, requiring the preparation of a federal EIS pursuant to NEPA and its implementing regulations (40 CFR 1500-1508).

The USACE has coordinated with other federal agencies including the U.S. Environmental Protection Agency (USEPA), U.S. Forest Service (USFS), and the U.S. Fish and Wildlife Service (USFWS). The USACE offered the seven federally-recognized Native American bands in northern Minnesota an opportunity to consult with the USACE regarding the project. Bois Forte Band requested to become a cooperating agency for the preparation of the EIS. The USACE will determine whether the EIS satisfies NEPA, the environmental review requirements of Section 404 of the CWA and will prepare the federal ROD.

2. PURPOSE AND NEED FOR PROJECT

The purpose of the Proposed Project is to increase the rate and total quantity of taconite pellet production at the Keetac facility using existing infrastructure. The need of the Proposed Project is to satisfy global demand for steel. The Project Proposer would achieve the project purpose by expanding an existing mine at Keetac and refurbishing and operating the currently idle Phase I taconite processing line to increase taconite pellet production by 3.6 MSTY to a total output of 9.6 MSTY. The Proposed Project need would be accomplished by shipping taconite pellets to steel mills, which would be used to produce steel to meet the domestic and worldwide demands.

A. Project Overview

The Project Proposer, United States Steel Corporation (U. S. Steel) proposes to restart an idled production line and expand contiguous sections of the open pit taconite mine (Proposed Project) at its existing Keetac mine and processing facility near Keewatin, Minnesota (Figure 1.1).

Keetac is located in the Mesabi Iron Range, a major, well-known geologic feature oriented roughly northeast to southwest across more than 120 miles of northeastern Minnesota from near Babbitt to near Grand Rapids. The Iron Range has been the largest source of iron ore produced in Minnesota since the

19th century, and Minnesota has been and continues to be the predominant source of iron ore in the United States.

Taconite mining and taconite pellet production have been ongoing at Keetac since 1967. Keetac began production using rotary hearth technology; this technology was soon abandoned for grate kiln technology. The original Phase I grate kiln pellet line began operation in 1969. In 1977, the Phase II expansion added a second grate kiln pellet line. The Phase I facility was idled in December 1980. Currently, there is one operational pellet producing line (Phase II) with an annual production rate of approximately 6.0 MSTY. The Proposed Project would increase the taconite pellet production capacity by expanding the mine pit, adding stockpile areas, upgrading the concentrating and agglomerating processes, and restarting the Phase I line. The Proposed Project would increase Keetac's taconite pellet production output by 3.6 MSTY to a total annual output of 9.6 MSTY.

Keetac's current footprint and the facility limit, established in the MNDNR Permit to Mine, are shown on Figure 1.2, and include mining pit limits, waste rock and surface stockpile areas, and tailings basin area. The Keetac facility is an active operating mine that can continue taconite pellet production at 6.0 MSTY until about the year 2021 under existing permits. The Proposed Project would increase taconite pellet production to 9.6 MSTY until about the year 2036.

At an estimated cost in excess of $300 million, the Proposed Project includes installation of energy-efficient technologies and new emission controls at the plant, expansion of mining and stockpiling, upgraded concentrating and agglomerating processes, a vertical expansion of the tailings basin, and construction of a biomass processing facility. The Proposed Project would increase the mine, waste rock and surface stockpiles, and tailings basin areas by a total of approximately 2,075 acres. Existing rock crushing facilities are adequate to accommodate existing operations as well as the Proposed Project. Existing infrastructure (public roads, railroads) and utilities (water, electric, gas and sewer) are also adequate for both existing operations and the Proposed Project. A spatial overview of the current and proposed Keetac footprint, including Proposed Project plans for the mine expansion, stockpile expansions, and tailings basin are shown on Figure 1.3.

The indurating furnace equipment from the idled Phase I line would be refurbished and fueled by natural gas and biomass with coal and fuel oil used as backup fuels. Upgrades to the concentrating, and agglomerating processes would be required to supply additional material to the refurbished and restarted indurating furnace equipment. Additional process water would be required to increase production of the facility. The height of the current tailings basin would increase by approximately 80 feet to accommodate the additional tailings with a potential slight change in the horizontal footprint.

Mine planning and detailed design were prepared for a 25-year horizon. Additional mining expansion would likely require additional environmental review and permitting, should the project extend beyond this 25-year mining period. Expansion of the Proposed Project beyond that described in this EIS could require supplemental environmental review.

3. ABOUT THE PROPOSER

U. S. Steel, headquartered in Pittsburgh, Pennsylvania, is an integrated steel producer, with a raw steelmaking capability of 31.7 MSTY. Producing steel for over 100 years, U. S. Steel has production operations in the United States, Canada, and Central Europe. The company manufactures a wide range of steel sheet and tubular products for the automotive, appliance, container, industrial machinery, construction, and oil and gas industries. U. S. Steel is also involved in transportation services (railroad and barge operations) and real estate operations.

The company operates two iron mines through its Minnesota Ore Operations on the Mesabi Iron Range. They are Minntac in Mt. Iron and Keetac in Keewatin. Minntac and Keetac both mine taconite and

concentrate it into taconite pellets. More information about U. S. Steel is available on their website: www.ussteel.com.

4. PROPOSED ACTION ALTERNATIVE

The Proposed Action Alternative (Proposed Project) is changes in the operation of the Keetac facility under new permits, or amendments to existing permits that increase discharges or emissions and/or disturbs additional land outside the Permit to Mine facility limit. The Proposed Action Alternative describes potential environmental and socioeconomic effects that would occur if the mine expands operations beyond the No Action Alternative (described below).

> The Proposed Action Alternative describes potential environmental and socioeconomic effects that would occur if the mine expands beyond the No Action Alternative. Also referred to as the Proposed Project, this alternative would increase taconite pellet production by 3.6 MSTY for a total annual output of approximately 9.6 MSTY.

The proposed Keetac footprint illustrates the extent of the Proposed Project area, where potential environmental impacts would occur. A different sequence of mine development would occur under the No Action Alternative, compared to the Proposed Project. The Proposed Project would not start after the completion of the No Action Alternative, rather the proposed mine pit expansion would occur simultaneously in areas identified in both the No Action and Proposed Action Alternatives. Mine pit expansion would occur in these areas in order to meet the purpose and need of the Proposed Project (i.e., increased production to 9.6 MSTY).

A 25-year mine plan for the Proposed Project is evaluated in this EIS. Actions beyond 25 years or outside the Proposed Project boundary may require additional environmental review at that time. Likewise, mine permits are being requested for a 25-year mining program. Air and water-related permits are issued for shorter timeframes, typically with renewal at specified intervals (i.e., Title V air permit renews every five years) and permit amendments for actions that do not create an increased discharge or emission.

Open pit methods (as currently used at Keetac) would be used for the Proposed Project mining activities. Two main areas of the existing mine pit would be expanded. The first of these two expansion areas (proposed south mine pit expansion) is located west of the plant, expanding the existing Bennett/Russell Pit south. The second area of pit expansion (proposed east mine pit expansion) would include dewatering Reservoir Five to expand the Section 18 Pit east. In addition, the largest portion of the expansion would occur east of the Stevenson Pit continuing north, adjacent to and abutting the Hibbing Taconite (Hibtac) mine. The proposed south mine pit expansion and proposed east mine pit expansion are shown on Figure 1.3.

Expansion of the mine pit requires a Permit to Mine Amendment Application to the MNDNR. The Project Proposer submitted a Permit to Mine Application in July 2009. The Project Proposer currently plans to begin stripping and mining activities in both the proposed south and east mine pit expansions during the initial 5-year period of the new mine plan (2012 to 2017).

In summary, the Proposed Project is defined as the incremental change beyond what is allowed under the No Action Alternative and existing permits. Key features of the Proposed Project include:

- Starting the new indurating line and upgrading concentrating and agglomeration processes
- Refurbishing the Phase I grate kiln furnace and changing the mixture of fuels used at Keetac to include biomass
- Expanding mine pit and stockpile boundaries

5. NO ACTION ALTERNATIVE

The No Action Alternative is to continue operating the facility under its current capacity and permits.

Keetac is an operating taconite mine and taconite pellet processing facility. The No Action Alternative is defined as the continued operation of the mine and processing facility which would produce approximately 6.0 MSTY of taconite pellets. The No Action Alternative describes potential environmental and socioeconomic effects that would occur if the Proposed Project is not developed and the mine continues to operate. Mining at Keetac is anticipated to continue for approximately 12 years (until 2021) without the Proposed Project or new (amended) permits.

The No Action Alternative includes ongoing actions (mining, taconite processing, and transport) at Keetac that would occur under the existing Permit to Mine, currently permitted wetlands, actions occurring under permits that undergo renewal at specified intervals (i.e., Title V air permit renews every five years), and permit amendments for actions that do not create an increased discharge or emission (i.e., water appropriations permit amendment to maintain same pumping rate from a new source within current Permit to Mine facility limit).

The geographic boundary of the No Action Alternative encompasses areas within the current facility limit of the Permit to Mine that have been or would be developed without the need for new or amended permits. Figure 3.2.1 illustrates the geographic boundary of the No Action Alternative assuming the mine pit would continue to expand only with existing approved permits.

6. PROJECT ALTERNATIVES

The purpose of the project is to increase the rate and total quantity of taconite pellet production at the Keetac facility using existing infrastructure. The applicant's preferred alternative would achieve the project purpose through the expansion of an existing mine pit, and the re-starting of an existing idle indurating line.

Minnesota Rules Chapter 4410 requires an evaluation of Site Location Alternatives. Minnesota Rules Chapter 4410 allows the RGU to exclude alternative sites if other sites do not have significant environmental benefit compared to the project as proposed, or if other sites do not meet the underlying need and purpose of the Proposed Project.

A. Alternative Site

The FSDD states that "the MNDNR and USACE do not propose to evaluate alternative mine pit sites for the Proposed Project. An alternative mine site would not meet the underlying need or purpose of the Proposed Project. The mineralization of desired elements [presence of iron ore] within a geologic deposit dictates the location of the mine pit."

Geologic deposits in the Iron Range have the desired characteristics for the Project Proposer to operate a mine site. Outward expansion of the mine is determined by the location and formation of the ore body. The Proposed Project would utilize the ore body for mining and taconite production by expanding the existing mine pit further into the ore body.

While an alternative iron ore mine pit could facilitate the mining of taconite, it would not take advantage of the existing infrastructure at the Keetac site. As a result, new infrastructure which may include the processing plant, roads, power lines, tailing basin dam, etc., would need to be put in place at an alternative location. The increased impacts of constructing this infrastructure would not provide an environmental benefit when compared to the Proposed Project. The complement of existing usable infrastructure and available iron ore makes the Proposed Project practicable.

B. Alternative Technologies

Best Available Control Technology (BACT)

The FSDD states that the EIS will evaluate air pollution control methods and/or technologies on sources of air pollutants, and Best Available Control Technology (BACT) where applicable. Emission units associated with the Proposed Project require a BACT analysis for SO_2, PM, PM_{10}, and $PM_{2.5}$. BACT analysis includes the following steps, which are consistent with the process utilized to identify, evaluate, and select alternatives during the environmental review process:

Step 1 – Identify all control technologies
Step 2 – Eliminate technically infeasible options
Step 3 – Rank remaining control technologies by control effectiveness
Step 4 – Evaluate the most effective control technologies and document results
Step 5 – Select BACT

The BACT analysis documents the process utilized to assess air pollution control technologies for the Proposed Project. Based on the findings of this analysis, proposed air pollution control technologies are selected. Section 4.7.3 provides additional details on the specific control technologies selected for the Proposed Project.

Mercury Emissions

The FSDD stated that the EIS will identify all sources of mercury emissions, review mercury control technology for the Proposed Project, and summarize other potential mercury control technologies.

As part of this EIS analysis, mercury emissions and controls were evaluated. These evaluations reviewed the technical feasibility of possible mercury emission controls for the Proposed Project. The Project Proposer used a BACT-like analysis to evaluate the prospective mercury emissions controls.

The majority of research and published information of mercury control technologies focuses on coal-fired utility boilers. Research for mercury control technologies at taconite processing plants is ongoing. The mercury control technologies are classified into three categories of availability; commercially available, emerging technology, and in the research and development stages. These technologies were evaluated on their technical feasibility to the Proposed Project, their control effectiveness, and other impacts that may occur.

Based on the review of the available mercury control technologies, the Project Proposer has chosen to install activated carbon injection to control mercury emissions for the new line. Section 4.7.7 provides additional details on this mercury control technology selected for the Proposed Project.

Greenhouse Gas Emissions

The FSDD states that the EIS will compare greenhouse gas (GHG) emissions from project alternatives and discuss the conclusions from the analysis. New and evolving environmental guidance and regulations on the state and federal levels recognize the potential consequences of GHG emissions on climate change. To address that issue, a methodology to analyze climate change was tailored for the Proposed Project by the MNDNR Briefing Sheet (MNDNR, 2008C).

As outlined by the Briefing Sheet, Project Alternatives analyzed by the Project Proposer are summarized as follows:

- Develop a carbon footprint for the Proposed Project with and without proposed GHG reduction activities. This would result in two alternatives, presented in Section 3.5.2.1.
- Develop fuel mix alternatives, presented in Section 3.5.2.2.

- Discuss the alternative of producing iron pellets in another country with weaker emissions control, presented in Section 3.5.2.3.

The Project Alternatives related to GHG emissions are presented in the Climate Change Report. This report provides the calculations and methodology for the GHG emissions. Also presented in the EIS is a comparison of GHG emissions for the existing pellet production facility to the Proposed Project (see Section 3.5.2.4). A detailed description of GHG emissions and their relation to climate change is provided in Section 5.2 of the EIS.

C. Modified Design or Layout

Minnesota Rules, part 4410.2300 requires an evaluation of modified designs or layouts of the facility. The FSDD states that the following major components of the Keetac facility will be evaluated in the EIS:

- Plant and Pit Location on Site
- Tailings Thickener and Tailings Basin Locations
- Stockpile Location and Design, including Haul Roads
- Recreational Trails

The Proposed Project is an expansion of an existing facility with the major components, as listed above, included as part of current operations. A modified design or layout evaluating the inter-relationship of these components would require the relocation of two or more of the components listed above. This would be a major undertaking and require construction of new facilities, which would likely not have significant environmental benefit compared to the Proposed Project.

Plant Site

The FSDD states that "the MNDNR and USACE do not propose to evaluate alternative mine plant sites for this Proposed Project. An alternative processing plant site would not have significant environmental benefit over the Proposed Project. The new processing line would be located on the existing Phase I plant footprint. A new plant location would alter land cover types and terrestrial habitats. Moreover, it would not meet the underlying need and purpose of the Proposed Project which includes reusing existing plant infrastructure" already in place for use by the Proposed Project.

Pit Location

As stated in the FSDD, "the MNDNR and USACE do not propose to evaluate alternative mine pit sites for the Proposed Project. An alternative mine site would not meet the underlying need or purpose of the Proposed Project."

Geologic deposits in the Iron Range have the desired characteristics for the Project Proposer to operate a mine site. Outward expansion of the mine is determined by the location and formation of the ore body. The Proposed Project would utilize the ore body for mining and taconite production by expanding the existing mine pit further into the ore body.

While an alternative iron ore mine pit could facilitate the mining of taconite, it would not take advantage of the existing infrastructure at the Keetac site. As a result, new infrastructure which may include the processing plant, roads, power lines, tailing basin dam, etc., would need to be put in place at an alternative location. The increased impacts of constructing this infrastructure would not provide an environmental benefit when compared to the Proposed Project. The complement of existing usable infrastructure and available iron ore makes the Proposed Project practicable.

Tailing Thickener

The FSDD also stated "the MNDNR and USACE do not propose to evaluate tailing thickener sites for the Proposed Project. An alternative tailing thickener location would not have significant environmental benefits over the proposed location because the proposed tailings thickener locations are adjacent to the existing plant on previously disturbed ground. No other locations have significant environmental benefits over the proposed location."

Tailings Basin

The FSDD stated that the MNDNR and USACE do not propose to evaluate alternative tailings basin sites for the Proposed Project. The Proposed Project intends to maintain the existing area of the tailings basin and build the basin vertically as tailing are produced, which would slightly expand the footprint of the active tailings basin. Without mitigation, a taller tailings basin may generate more fugitive dust, because of greater wind erosion across the surface of the basin. However, these possible adverse effects are offset by the land disturbance a new tailings basin would create, and can feasibly be mitigated. A new tailings basin location would therefore have no environmental benefits compared to the existing tailings basin.

Stockpile Design

The MNDNR and USACE do not propose to evaluate an alternative stockpile design. The proposed design would adhere to the relevant rules (Minnesota Rules Chapter 6130) for the construction of a stockpile for mining activities that are prescriptive in nature, defining maximum slope/bench configurations and vegetation requirements.

Stockpiles

The FSDD states, "Positioning of stockpiles is crucial to minimizing impacts to wetlands and potentially other natural resources. The EIS will evaluate the potential environmental effects of the proposed stockpile locations as well as alternative stockpile locations. In addition, the EIS will evaluate in-pit stockpile opportunities; in-pit stockpiles can help create future shallow-water habitat when pits are abandoned and reclaimed. This stockpile location analysis will consider not only potential wetland impacts, but also air emissions from haul truck and wind erosion, haul road location, lease fee-holder requirements, in-pit stockpile opportunities and other operational and environmental issues."

> The Project Proposer estimates with maximization of in-pit stockpile and existing stockpile options, an additional 118 million bank cubic yards (Mbcy) of excess surface material from the Proposed Project would need to be stockpiled.

A detailed stockpile location analysis was completed for this DEIS, which evaluated the two proposed stockpile locations, several alternative stockpile location concepts, and in-pit stockpile opportunities. This analysis along with supporting documentation is presented in Appendix E, and is summarized below.

The stockpile location analysis used a number of criteria to evaluate potential alternative stockpile locations. These criteria included the following:

- Location Relative to Iron Formation
- Surface Ownership, Control, and Mineral Rights Ownership
- Quantity and Duration of Stockpile Activity
- Haul Route Configurations and Haul Truck Operation
- Natural Habitat
- Wetland Acreage and Condition
- Upland Acreage
- Threatened and Endangered Species
- Air Quality

- Community Factors
- Feasibility and Economic Factors
- Safety Factors

The Project Proposer estimates with maximization of in-pit stockpile and existing stockpile options, an additional 118 million bank cubic yards (Mbcy) of excess surface material from the Proposed Project would need to be stockpiled. Surface material would need to be removed over 21.5 years to continue uninterrupted mining of taconite. Using the stockpile capacity needs as a baseline to determine stockpile area size, several stockpile location concepts were evaluated using the criteria listed above. Greater detail is provided in the stockpile location analysis (Appendix E) for each of the stockpile location concepts, along with the results of the analysis and figures showing the evaluated stockpile concepts. The results of the analysis are summarized in Section 3.6 of the DEIS. The analysis determined that no other stockpile location had a greater environmental benefit over the proposed stockpile location.

D. Scale or Magnitude Alternative

The FSDD states "the MNDNR and USACE do not propose to evaluate proposed project scale or magnitude alternatives. The infrastructure requirements to mine and process ore are such that alternative scale or magnitude changes would not meet the underlying need for or purpose of the Proposed Project."

7. SUMMARY OF POTENTIAL ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

The following table summarizes potential environmental impacts, mitigation and monitoring measures for the Proposed Project. The table indicates if the mitigation or monitoring measure has been adopted as part of the Proposed Project or has been identified as a measure that could be implemented. In some instances, possible mitigating items are identified as a measure which could be implemented should monitoring indicate that an impact is occurring. Additional information related to mitigation for the Proposed Project is provided in the corresponding chapters of this DEIS.

SUMMARY OF POTENTIAL IMPACTS, MITIGATION AND MONITORING MEASURES			
Corresponding Chapter in DEIS	**Potential Environmental Impact**	**Incorporated Into Proposed Project**	**Additional Identified Measures[1]**
4.1 Fisheries and Aquatic Resources	No significant impact anticipated	• Water quality monitoring required through NPDES/SDS permit • Monitoring of dewatering pumping flow rates	• If dewatering rates differ from projected, additional stream and lake monitoring and/or biological monitoring of habitat could occur • Conversion of mine pits to public fishing resources after project completion
4.2 Wildlife Resources	Loss of wildlife habitat in Proposed Project area	• Revegetation through Mineland Reclamation Minnesota Rules Chapter 6130 • On-site wetland creation in inactive tailings basin	
4.3 Threatened and Endangered Species	23 state-listed T&E plants impacted No impacts to T&E animal species		• Transplantation of endangered plant species • Land acquisition and preservation of endangered plant species sites • Conservation research funding
4.4.1 Wetlands	Approximately 780 acres of direct and indirect wetland impacts, in addition to temporary wetland impacts	• On-site wetland creation within inactive tailings basin area • Off-site mitigation in Aitkin County • Monitor indirect wetland hydrology impacts • Control erosion from stockpiles	
4.4.2 Non-Wetlands	No significant impact anticipated	• Monitor dewatering pumping flow rates	
4.4.3 Dam Safety	No significant impact anticipated	• Monitor tailing basin dam stability • Submit Annual Dam Safety Status Report to MNDNR	
4.5 Water Use	No significant impact anticipated	• Project Proposer has entered into contingency agreements with Cities of Keewatin and Nashwauk	• Priorities and responsibilities as identified in Minnesota Statutes (103G.261) and Minnesota Rules, part 6115.0730
4.6 Wastewater/ Water Quality	2.6 mg/L increase in Swan Lake sulfate concentration, above No Action Alternative	• Installation of a sulfate removal treatment system on the existing wet scrubber • Permit limits in NPDES/SDS permit • Water quality monitoring required through NPDES/SDS permit	• Installation of additional sulfate removal technology

SUMMARY OF POTENTIAL IMPACTS, MITIGATION AND MONITORING MEASURES			
Corresponding Chapter in DEIS	**Potential Environmental Impact**	**Incorporated Into Proposed Project**	**Additional Identified Measures[1]**
4.7.1 Emissions Inventory and Calculation of Emissions	Potential air emissions	• Testing and monitoring to confirm proper operation and compliance with emission limits	
4.7.2 Fugitive Dust Control	Fugitive dust emissions	• Continued implementation of fugitive dust control plan	
4.7.3 BACT Review	Major stationary sources of air emissions	• Installation of best available air pollution control technologies • Testing and monitoring to confirm proper operation and compliance with emission limits	
4.7.4 MACT Compliance	Taconite iron ore emissions	• Installation of best available air pollution control technologies • Testing and monitoring to confirm proper operation and compliance with emission limits	
4.7.5 Class I Area Impacts Analysis	Air quality impacts to Class I areas	• Using a mix of biomass and natural gas fuel to minimize Class I impacts	• Install emission reduction/control equipment • Enforceable reductions in emissions from the Proposed Project or nearby sources • Secure and retire tradable emission allowances • On-site Green Energy Generation
4.7.6 Class II Area Impacts Analysis	Air quality impacts to Class II areas	• Testing and monitoring to confirm proper operation and compliance with emission limits	
4.7.7 Mercury Emissions/ Mercury Balance/ TMDL Implementation Plan Compliance	Mercury bioaccumulation in fish	• MPCA Implementation of the Mercury TMDL • Installation of activated carbon injection system on new line • Technology testing, installation of controls, and emission reductions at Minntac	

SUMMARY OF POTENTIAL IMPACTS, MITIGATION AND MONITORING MEASURES			
Corresponding Chapter in DEIS	**Potential Environmental Impact**	**Incorporated Into Proposed Project**	**Additional Identified Measures[1]**
4.7.8 Human Health Risk Assessment	No significant impact anticipated	• Installation of best available air pollution control technologies • Installation of activated carbon injection system on new line • Testing and monitoring to confirm proper operation and compliance with emission limits	
5.1 Biomass	Removal of residual biomass and roundwood from forest management sites		• Purchase biomass from suppliers that have MMLC or similar certification status • Develop a third-party audit and verification program • Maximize biomass from tree removal due to disease, thinnings, urban trimmings, and fire management
5.2 Climate Change	Potential for global warming	• Using a mix of biomass and natural gas fuel to minimize CO_2 emissions • Furnace improvements to reduce fuel usage • Heat recovery to reduce fuel usage • Use of efficient electric motors • Biomass drying using waste heat from existing line • Logistical changes • Wetland creation	• Purchase of carbon offsets • Additional operational energy efficient improvements that result in GHG emission reductions
5.3 Aquatic Habitat and Fisheries	No significant impact anticipated		• Monitoring of water levels in Swan Lake and if necessary, modification to outlet weir to control Swan Lake water levels and flow to Swan River

SUMMARY OF POTENTIAL IMPACTS, MITIGATION AND MONITORING MEASURES			
Corresponding Chapter in DEIS	**Potential Environmental Impact**	**Incorporated Into Proposed Project**	**Additional Identified Measures[1]**
5.4 Wild Rice Resources	Not known, however the changes in water levels and sulfate concentrations resulting from Proposed Project appear to be within the observed range of variation for lakes containing wild rice	• Installation of dry scrubber air pollution control for SO_2 removal • Installation of a sulfate removal treatment system on the existing wet scrubber • Permit limits in NPDES/SDS permit • Water quality monitoring required through NPDES/SDS permit	• Conduct follow-up field surveys to monitor the extent of wild rice and track changes in density and distribution of wild rice in Swan Lake, the west bay of Swan Lake, Swan River, Hay Creek, and Hay Lake • Monitor water levels in Swan Lake, the west bay of Swan Lake, Swan River, Hay Creek, and Hay Lake during critical life cycle stages of wild rice • Monitor sulfate concentrations in Swan Lake, the west bay of Swan Lake, Swan River, Hay Creek, and Hay Lake • Wild rice habitat restoration • Installation of additional sulfate removal technologies • Alternate discharge location and/or water re-use
5.5 Mercury and Sulfate Emissions	Mercury bioaccumulation in fish	• MPCA Implementation of the Mercury TMDL • Installation of activated carbon injection system on new line at Keetac • Technology testing, installation of controls, and emission reductions at Minntac • Installation of dry scrubber air pollution control for SO_2 removal • Installation of a sulfate removal treatment system on the existing wet scrubber • Permit limits in NPDES/SDS permit • Water quality monitoring required through NPDES/SDS permit	

SUMMARY OF POTENTIAL IMPACTS, MITIGATION AND MONITORING MEASURES			
Corresponding Chapter in DEIS	**Potential Environmental Impact**	**Incorporated Into Proposed Project**	**Additional Identified Measures[1]**
5.6 Wildlife Habitat Loss and Fragmentation	Loss of habitat and corridor obstruction	• Revegetation through Mineland Reclamation Minnesota Rules Chapter 6130 • Maximizing in-pit stockpiling	• Ensure that Corridor #4 which is outside of the Proposed Project footprint remains open • Additional in-pit stockpiling, if feasible • Consider monetary contributions from proposed projects that could be used by the MNDNR or the USFS to manage or create forest land
5.7 Threatened and Endangered Species	No significant cumulative impacts anticipated		• Transplantation of endangered plant species • Land acquisition and preservation of endangered plant species sites • Conservation research funding
5.8 Stream Flow and Lake Level Changes	No significant impacts anticipated		• Monitoring of water levels in Swan Lake • If necessary, modification to outlet weir to control Swan Lake water levels and flow to Swan River
5.9 Inter-basin Transfer of Water	Inter-basin transfer of water between the Mississippi River watershed and the Great Lakes watershed		• Protect runout elevations between the two watersheds
5.10 Loss of Wetlands	Loss of wetlands	• On-site wetland creation within inactive tailings basin area • Off-site mitigation in Aitkin County • Monitor indirect wetland hydrology impacts	
5.11 Wastewater/ Water Quality	10 mg/L increase from existing concentration in Swan Lake sulfate concentration level (cumulative effect) 2.6 mg/L increase from the No Action Alternative concentration in Swan Lake sulfate concentration level (cumulative effect)	• Installation of sulfate removal treatment technology on the existing wet scrubber • Permit limits in NPDES/SDS permit • Water quality monitoring required through NPDES/SDS permit	• Installation of additional sulfate removal technology
5.12 Class I Areas	Visibility quality impacts to Class I areas		• Implementation of Regional Haze State Implementation Plan

SUMMARY OF POTENTIAL IMPACTS, MITIGATION AND MONITORING MEASURES			
Corresponding Chapter in DEIS	**Potential Environmental Impact**	**Incorporated Into Proposed Project**	**Additional Identified Measures[1]**
5.13 Ecosystem Acidification	No significant impacts anticipated	• Installation of best available air pollution controls for SO_2 emissions	
5.14.1 Human Health Risk Assessment	Human health-related impacts	• Using a mix of biomass and natural gas • Installation of best available air pollution control technologies • Installation of activated carbon injection system on new line • Testing and monitoring to confirm proper operation and compliance with emission limits	
5.14.2 Ecological Risk Assessment	No significant impacts anticipated	• Installation of best available air pollution control technologies • Installation of activated carbon injection system on new line • Testing and monitoring to confirm proper operation and compliance with emission limits • Installation of sulfate removal treatment technology on the existing wet scrubber • Permit limits in NPDES/SDS permit • Water quality monitoring required through NPDES/SDS permit	
6.1 Land Use	No significant impacts anticipated		
6.2 Cover Types	41 acres of farmland soils 780 acres of wetlands 560 acres of forest	• On-site wetland creation within inactive tailings basin area • Off-site mitigation in Aitkin County • Monitor indirect wetland hydrology impacts • Revegetation through Mineland Reclamation Minnesota Rules Chapter 6130	
6.3 Water-related Land Use Districts	No significant impacts anticipated		

SUMMARY OF POTENTIAL IMPACTS, MITIGATION AND MONITORING MEASURES			
Corresponding Chapter in DEIS	**Potential Environmental Impact**	**Incorporated Into Proposed Project**	**Additional Identified Measures[1]**
6.4 Erosion and Sedimentation	No significant impacts anticipated	• Storm Water Pollution Prevention Plan (SWPPP) Best Management Practices (BMPs) • Revegetation through Mineland Reclamation Minnesota Rules Chapter 6130	
6.5 Surface Water Runoff	No significant impacts anticipated	• Collection and re-use of stormwater • Storm Water Pollution Prevention Plan (SWPPP) Best Management Practices (BMPs)	
6.6 Geologic Hazards and Soil Conditions	No significant impacts anticipated	• Revegetation through Mineland Reclamation Minnesota Rules Chapter 6130 • Spill Prevention Control and Countermeasure (SPCC) Plan	
6.7 Solid Wastes, Hazardous Wastes, and Storage Tanks	No significant impacts anticipated	• Tailings disposal regulated through NPDES/SDS, Dam Safety Permit and Revegetation per Mineland Reclamation Minnesota Rules Chapter 6130 • Overburden and waste rock stockpiles revegetated per Mineland Reclamation Minnesota Rules Chapter 6130 • Solid and hazardous wastes stored, handled, and disposed according to Minnesota Rules Chapters 7035 and 7045 • Above ground storage tank permits • Spill Prevention Control and Countermeasure (SPCC) Plan	
6.8 Traffic	Longer delay at 1st St. and 3rd Ave. during construction; Safety concern at 1st St. and 3rd Ave.		• Change to four-way stop • Lengthen no parking zone along north curb of westbound approach

SUMMARY OF POTENTIAL IMPACTS, MITIGATION AND MONITORING MEASURES			
Corresponding Chapter in DEIS	**Potential Environmental Impact**	**Incorporated Into Proposed Project**	**Additional Identified Measures[1]**
6.9 Odors, Noise, and Dust	Potential for noise and dust	• Setbacks and quieting dozer equipment • Fugitive Dust Control Plan	• Noise monitoring
6.10 Historic Properties	Destruction of Bennett No. 2 Shaft Mine	• Phase III data recovery	
6.11 Federal Trust Responsibilities to Indian Bands	440 acres of land taken out of public access		
6.12 Recreational Trails	Impact to Hibbing South Spur Trail	• Re-route trail segment	
6.13 Visual Impacts	Stockpiles increase 300 feet in height from existing grade; Tailings basin increase 80 feet in height	• Revegetation through Mineland Reclamation Minnesota Rules Chapter 6130	• Planting of additional trees and vegetation
6.14 Infrastructure and Public Services	Potential impacts to groundwater supplies	• Project Proposer entered into contingency agreements with the Cities of Keewatin and Nashwauk	
6.15 Socioeconomics	No significant impacts anticipated		• Work with various groups on future planning/preparation
6.16 Mineland Reclamation	No significant impacts anticipated	• Revegetation through Mineland Reclamation Minnesota Rules Chapter 6130	
6.17 Amphibole Mineral Fibers	Potential presence of amphibole mineral fibers	• No processing of material containing amphibole fibers • Record keeping of stockpiles containing material potentially containing amphibole fibers	

[1] One or more measures that could be undertaken by the Project Proposer as a permit condition, or if an action of the Proposed Project identifies an impact. Monitoring could be used to determine if impacts are occurring and to identify if and/or a type of mitigation which could be further implemented.

Proposed Project Timeline

The Proposed Project timeline is dependent on numerous factors including completion of the EIS process, acquiring all necessary permits (federal, state and local), and the construction of the Proposed Project. The following timeline is presented to provide a general understanding of the anticipated project schedule, which is subject to change.

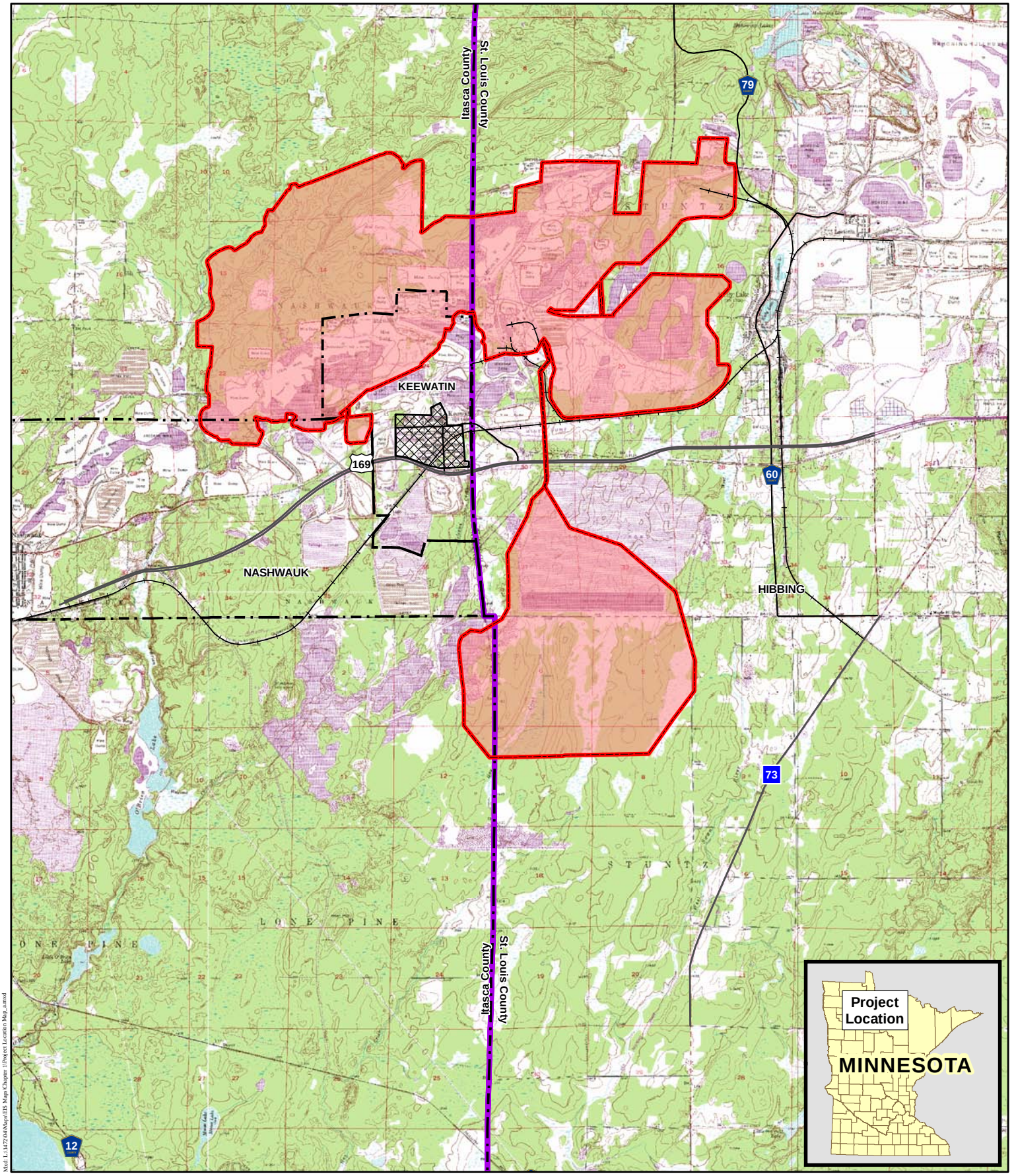
ESTIMATED PROJECT SCHEDULE

Complete the EIS, obtain permits and acquire project financing	2009 – 2010
Start construction Year 1 – Year 2	2010 – 2012
Complete construction and begin water management plan for the Proposed Project including dewatering of mine pits	2013 – 2015
Begin full operation of Proposed Project	2013 – 2015

DEIS Organization

This DEIS analyzes potential impacts from the Proposed Project for various topics as identified in the FSDD. Volume I of the DEIS is broken into the following components:
Chapter 1 – Introduction
Chapter 2 – Government Approvals
Chapter 3 – Alternatives and Proposed Actions
Chapter 4 – Affected Environment and Environmental Consequences
Chapter 5 – Cumulative Effects
Chapter 6 – Additional Affected Environment and Environmental Consequences
Chapter 7 – Consultation and Coordination

Additional information related to the list of preparers and references can be found in Chapters 8 and 9, respectively. This DEIS also contains figures and appendices in Volume II and III, respectively, and the reader is directed to these sources of information as needed throughout the DEIS.



Mxd: L:\4272\04\Maps\EIS Maps\Chapter 1\Project Location Map_a.mxd

Legend

- Keewatin Urban Development
- City Boundary
- Railroad
- County Boundary
- Current and Proposed Keetac Footprint

N

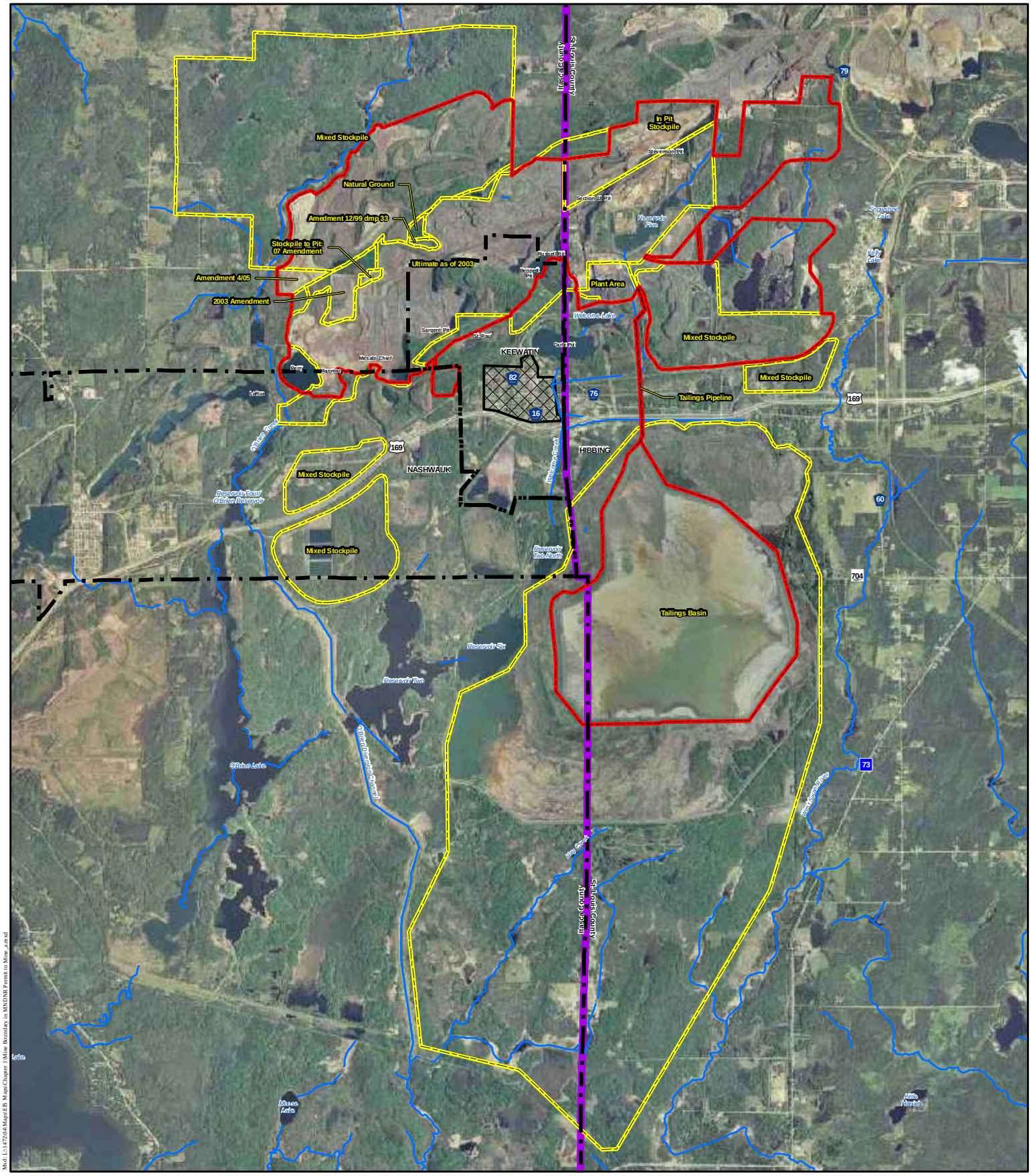
0.5 0 0.5 1

Miles

Source: USGS, Barr, LMIC, MNDNR, National Hydro Dataset, MPCA, Itasca County, St. Louis County, City of Hibbing, City of Nashwauk, U.S. Steel, and Mn/DOT. 2008 Aerial Photograph

Figure 1.1
Project Location Map
U.S. Steel Keetac
Keewatin, MN

Minnesota Department of Natural Resources



Legend

- Current MNDNR Permit to Mine Facilities Limit
- Current and Proposed Keetac Footprint
- City Boundary
- Keewatin Urban Development
- County Boundary
- Streams

N

0.5 0 0.5 1

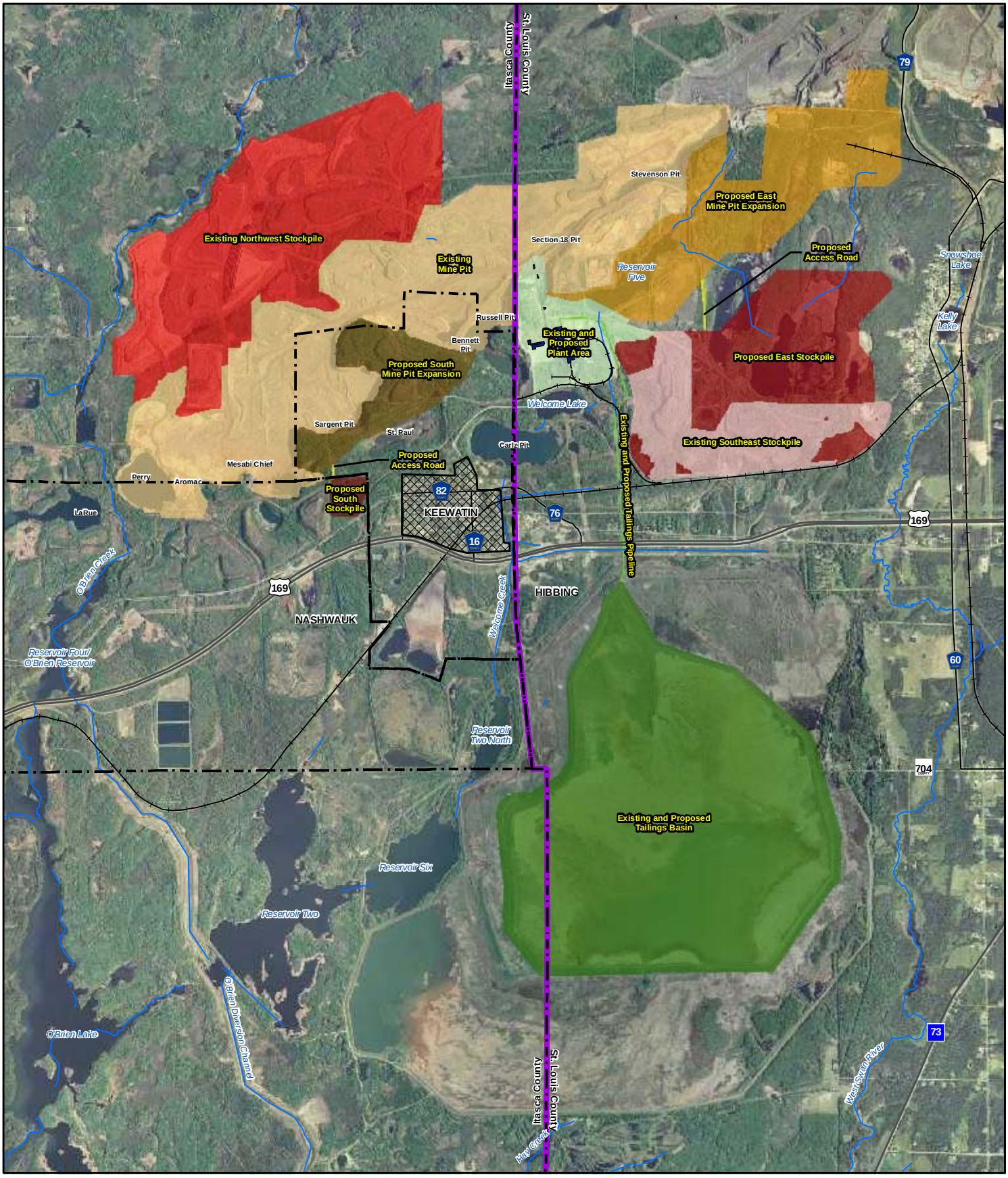
Miles

Source: USGS, Barr, LMIC, MNDNR, National Hydro Dataset, MPCA, Itasca County, St. Louis County, City of Hibbing, City of Nashwauk, U.S. Steel, and Mn/DOT. 2008 Aerial Photograph

Figure 1.2
Comparision of Current and Proposed Keetac Footprint and Current MNDNR Permit to Mine Facilities Limit
U.S. Steel Keetac
Keewatin, MN

Minnesota Department of Natural Resources

Mxd: L:\1472\d\Maps\EIS Maps\Chapter 1\Mine Boundary in MNDNR Permit to Mine_a.mxd



Mxd: L:\1472\da\Maps\EIS Maps\Chapter 1\Proposed Project Boundaries_a.mxd

Legend

Project Areas
- Existing Southeast Stockpile
- Existing Northwest Stockpile
- Proposed East Stockpile
- Proposed South Stockpile
- Proposed Stockpile Roads
- Existing Mine Pit
- Proposed East Mine Pit Expansion
- Proposed South Mine Pit Expansion
- Plant Area
- Tailings Basin
- Tailings Pipeline

- Keewatin Urban Development
- City Boundary
- County Boundary
- Streams
- Railroad

N

0.5 0 0.5 1

Miles

Source: USGS, Barr, LMIC, MNDNR, National Hydro Dataset, MPCA, Itasca County, St. Louis County, City of Hibbing, City of Nashwauk, U.S. Steel, and Mn/DOT. 2008 Aerial Photograph

Figure 1.3
Current and Proposed
Keetac Footprint Areas
U.S. Steel Keetac
Keewatin, MN

Minnesota Department of Natural Resources